

Stratford Army Engine Plant
Restoration Advisory Board (RAB)
Meeting March 2, 2000

The Stratford Army Engine Plant (SAEP) which is proceeding with closure action under provisions of the Base Realignment and Closure Act (BRAC) of 1995 will hold a Restoration Advisory Board (RAB) on March 2, 2000 at 7p.m. in Room 22, Stratford Army Engine Plant. The meeting is open to the public. Parking is in the West Lot and entry through the main guard station.

Stratford Army Engine Plant
Restoration Advisory Board (RAB)
Meeting March 2, 2000

AGENDA

1. Welcome, opening remarks, introductions, announcements, old business.
2. Presentation of Pre-design Investigation Report and Engineering Evaluation/Cost Analysis [EE/CA] for the Causeway
3. Status of Pre-design Investigation Report and EE/CA for Groundwater
Expected availability in late March
4. Status of Remedial Investigation Report
Expected availability in mid-April
5. Open forum, next meeting, adjourn.

Note: Item 2 is available for public review in Room 30 at SAEP
Items 3 and 4 will be in public document library in Room 30 SAEP as they become available

For additional information call the SAEP BRAC office (John Bureson) at 385-4316 or Margarita Hartley Moore, RAB Community Co-Chairperson at Redacted - Privacy Act;

RAB MEETING - MARCH 2, 2000
SIGN-IN SHEET

JIM OTTO RAB

JIM MIHALEY HEALTHY STRATFORD COUNCIL Redacted - Privacy Act

G. L. GANTHER, MD. STATE SENATE Redacted - Privacy Act

Tim Corley U.S. Army Corps of Engrs. New York District

BOB KASPARI USATACOM

Ken Feathers CT DEP

Phil Durgin USAACE

Nelson Walter Harding Lawson Assoc

Krystn Hansen Harding Lawson Associates

ALAN PIECICH HARDING LAWSON ASSOCIATES

STAN SILVERSTEIN RAB

RICK NORRIS LEAPAC

JOHN BURLESON TACOM / LEAPAC / RAB

JANET CARLUCCI RAB

Redacted - Privacy Act

Redacted - Privacy Act

BRAD ROBBINS WILMINGTON WILMINGTON TOWER + DUCI DC

DENNIS SOLTIS (FORMER ALLIED SIGNAL EMPLOYEE)

JOHN TULLOCK (" " " ")

MARCIA STEWART RAB/PYE

Phil Katz RAB

RAB MEETING - MARCH 2, 2000
SIGN-IN SHEET

FRED HYATT

BTC SAEP

DOTIE BOSSIO

HCA

M. SUSCA

Team Stratford/TRC

F. BERGER

TEAM STRATFORD

D. GAILO

SECRETARY

STRATFORD ARMY ENGINE PLANT
RESTORATION ADVISORY BOARD (RAB)

MEETING MINUTES

March 2, 2000

The SAEP Restoration Advisory Board conducted a Regular Meeting on Thursday, March 2, 2000 at 7:00 p.m. in Room 22 of the Stratford Army Engine Plant, 550 Main St., Stratford CT, pursuant to notice duly given.

Call to Order: The meeting was called to order at 7:05 p.m.

Presiding: John Burleson, Community Co-Chairman

In Attendance: J. Otto, J. Mihaley, G. Gunther, T. Corley, B. Kaspari, K. Feathers, P. Durgin, N. Walter, K. Hansen, A. Piecuch, S. Silverstein, R. Norris, J. Carlucci, Redacted - Privacy Act B. Robbins, D. Soltis, J. Tullock, M. Stewart, P. Katz, F. Hyatt, D. Bossio, M. Susca, F. Berger

Members Absent: L. Perlmutter, J. Terceno, F. Gerarden, A. deMello, M. Hartley-Moore, E. O'Keefe

1. Welcome, Opening Remarks, Introductions, Announcements, Old Business: J. Burleson welcomed and introduced Tim Corley (USACE, New York District), and Bob Kaspari (USATACOM).

2. Presentation of Pre-design Investigation Report and Engineering Evaluation/Cost Analysis for the Causeway: A. Piecuch and N. Walter presented and reviewed the following.

a) Causeway and Dike NCRA objectives, field investigation, exploration locations, causeway results (geologic profile, exceedances), purpose, scope and removal action objective, and applicable or relevant and appropriate requirements.

b) Alternatives evaluated in the EE/CA:
°Capping with hydraulic barrier
°Capping with composite cover system
°Excavation and off-site disposal

c) Alternatives not evaluated in the EE/CA:
°No action
°Treatment

d) Comparative Analysis of Alternatives

3. OU2-Indoor Air Monitoring: N. Walter presented and reviewed the following.

a) 5 sampling rounds conducted from 9/99 to present.
b) Exceedances of criteria found in most locations of sampling.
c) Screening level risk assessment completed.
d) Ongoing actions (continued monthly sampling, further risk assessments).

4. Community Relations Support: K. Hansen (HLA) reported the following.

- °Public comment period for EE/CA (Causeway) - April-May
- °Remedial Investigation Report available mid-April
- °EE/CA for Groundwater available late April
- °Fact sheets on current projects will be prepared and available at SAEP
- °Administrative records will be updated through spring and summer of 2000



4. Open Forum, Next Meeting: Next RAB meeting will be Thursday, April 6th at 7:00 p.m.

5. Adjournment: There being no further business, the meeting adjourned at 9:35 p.m. on a Motion by M. Stewart and seconded by P. Katz.

Respectfully submitted,



Debbie Gallo, Recording Secretary

Project Status Updates

STRATFORD ARMY ENGINE PLANT

Foster Wheeler and
Harding Lawson Associates
March 2, 2000

Topics for March BCT/RAB Meeting

- Causeway and Dike Non-Time Critical Removal Action
 - Pre-Design Investigation Report
 - EE/CA
- Indoor Air Monitoring
- Community Relations Support

version
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Causeway and Dike NCRA

- The Causeway and Dike Non-Time Critical Removal Action (NCRA) contract was issued to Foster Wheeler (Boston, MA) and HLA in late June 1999
- The objectives of the Causeway and Dike NCRA are:
 - Perform field investigations to characterize physical and chemical subsurface conditions on the Causeway and Dike
 - Summarize the results of the field investigations in a Pre-Design Investigation Report
 - Document the decision process for selection of a potential removal process in an EE/CA and a Removal Action Memorandum (RAM)

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Causeway and Dike Field Investigation

- Geophysical surveys of both areas to assist in characterizing subsurface conditions to evaluate whether to drill or test pit, and to assist in placement of explorations
- Seismic survey performed concurrently with Causeway and Dike investigation
- 15 soil borings and 10 test pits on the Causeway to assess potential subsurface soil contamination; collected 48 samples for chemical analysis

7/20/2008

Harding Levees Association

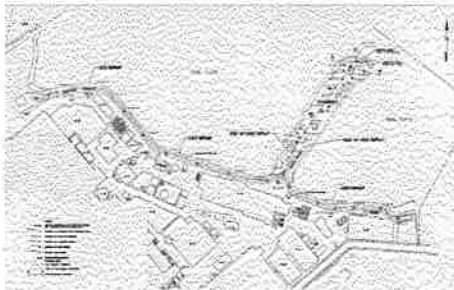
Causeway and Dike Field Investigation (cont.)

- Installation of 4 monitoring wells at 2 locations on Causeway
- CTDEP collected 8 soil samples for radiological analysis from 7 locations on the Causeway
- Honeywell collected 4 samples for radiological analysis from 4 locations on the Causeway

7/20/2008

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Causeway Exploration Locations



7/20/2008

Harding Levees Association

Causeway - Looking North



10/10/00

Harding Levee Association

Causeway - Looking North



10/10/00

Harding Levee Association

Causeway - Looking South



10/10/00

Harding Levee Association

Causeway - Looking South



W0000

Boeing Learning Association

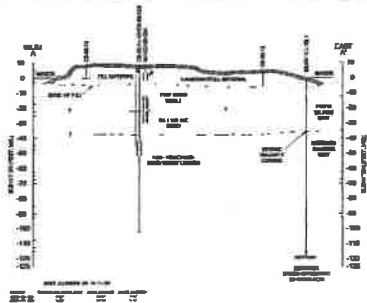
Causeway Results

- Fill material on Causeway up to 12 feet thick and comprised of well-graded clean sands to oil-stained sands, wood, metal, cobbles, concrete rubble, etc.; bedrock dips to the north and west (100 to 110 ft bgs)
- Contaminants in Causeway soils exceed CTDEP RSRs and include chlorinated VOCs, fuel-related compounds, PCBs and inorganics

W0000

Boeing Learning Association

Interpretive Geologic Profile Cross-Section A-A'



W0000

Boeing Learning Association

Causeway Results (cont.)

- Asbestos does not exist above trace levels (<1%) in Causeway soils
- Radiologically elevated soils are present in small, isolated locations on Causeway
- Preliminary Round 2 RI groundwater sampling results indicate groundwater beneath Causeway is not contaminated above CTDEP SWPC

WSP03

Harding Lawson Associates

Exceedances of Direct Exposure Criteria for Soil



WSP03

Harding Lawson Associates

Exceedances of GB Pollutant Mobility Criteria



WSP03

Harding Lawson Associates

Causeway and Dike EE/CA

■ **The EE/CA was prepared in accordance with the:**

- **Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)**
- **National Oil and Hazardous Substances Pollution Contingency Plan (NCP)**
- **USEPA Guidance on Conducting Non-Time-Critical Removal Actions Under CERCLA (August 1993)**
- **Base Realignment and Closure Cleanup Plan Guidebook (Fall 1993)**

10/19/93

Boiling Lagoon Associates

Causeway and Dike EE/CA

■ **Purpose:**

- **To support a Non-Time Critical Removal Action to address soil contamination that poses a potential risk to human health and the environment (CERCLA and NCP)**
- **To promote early reuse of facilities by expediting environmental cleanup (BRAC)**

■ **Scope:**

- **Identify removal action objectives**
- **Evaluate removal action alternatives**
- **Select a proposed remedy**

10/19/93

Boiling Lagoon Associates

Causeway and Dike EE/CA

■ **Removal action objective:**

- **Prevent exposure to contaminated soils in accordance with the CTDEP Remediation Standard Regulation (RSR) Direct Exposure Criteria (residential exposure scenario) and prevent leaching of contaminants from soils exceeding Pollutant Mobility Criteria (GB area)**

10/19/93

Boiling Lagoon Associates

Causeway and Dike EE/CA

■ Applicable or Relevant and Appropriate Requirements (ARARs)

- **Chemical-specific**
 - CTDEP R8R
- **Location-specific (partial listing)**
 - Protection of wetlands
 - Floodplain management
 - Coastal zone management
- **Action-specific (partial listing)**
 - CTDEP Solid and Hazardous Waste Management Regulations
 - Resource Conservation and Recovery Act (RCRA)

VERSION

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Causeway and Dike EE/CA

■ Alternatives evaluated in the EE/CA

- Capping with hydraulic barrier
- Capping with composite cover system
- Excavation and off-site disposal

■ Alternatives not evaluated in the EE/CA

- No action
- Treatment

VERSION

Building Lessons Association

Causeway and Dike EE/CA

■ Alternative 1

- Install portable dam
- Demolish Building 69
- Excavate and consolidate toe of slope material
- Grade the Causeway (cut and fill)
- Construct cover system
- Cover the Causeway with stone/riprap armor
- Establish environmental land use restrictions
- Conduct operation and maintenance

VERSION

Building Lessons Association

Causeway and Dike EE/CA

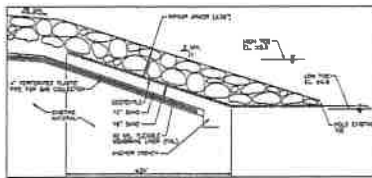
■ **Alternative 1 - Hydraulic Barrier Cover System**

- 12-Inch sand bedding/gas venting layer
- Flexible membrane liner (FML)
- 18-Inch sand protection layer
- 36-Inch thick stone/riprap armor

VERSION

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Alternative 1 - Cap with Hydraulic Barrier



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Causeway and Dike EE/CA

■ **Alternative 2**

- Install portable dam
- Demolish Building 60
- Excavate and consolidate toe of slope material
- Install a sheet pile seawall with tie-backs
- Grade the Causeway (cut and fill)
- Construct a composite cover system
- Cover the Causeway with stone/riprap armor
- Establish environmental land use restrictions
- Conduct operation and maintenance

VERSION

Harding Lawson Associates

Causeway and Dike EE/CA

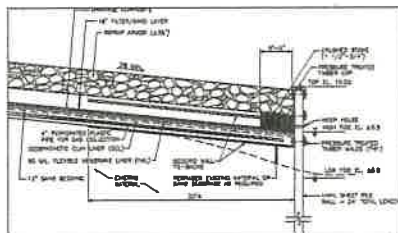
■ Alternative 2 - Composite Cover System

- 12-Inch sand bedding/gas venting layer
- Geocomposite clay liner (GCL)
- Flexible membrane liner (FML)
- Geocomposite drainage layer
- 18-Inch filter/sand protection layer
- 36-Inch thick stone/riprap armor

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Alternative 2 - Cap with Composite Cover System



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Causeway and Dike EE/CA

■ Design details associated with Alternatives 1 and 2

- Settlement and stability evaluation
- Material specifications
- Stone bedding layer and/or geotextile fabric below the stone/riprap armor
- Size and thickness of stone/riprap armor
- Use of alternate material for stone/riprap armor (e.g., precast concrete block mats)
- Toe protection to prevent scour and erosion due to wave reflection

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Causeway and Dike EE/CA

■ **Alternative 3**

- **Install portable dam**
- **Demolish Building 69**
- **Conduct soil characterization sampling**
- **Excavate the Causeway fill material**
- **Transport the excavated material to an off-site treatment/disposal facility**
- **Conduct soil confirmation sampling**

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Causeway and Dike EE/CA

■ **Evaluation of removal action alternatives**

- **Evaluation is based on specific criteria set forth in the NCP and USEPA guidance on preparing EE/CAs**
- **Evaluation criteria are:**
 - **Effectiveness**
 - **Implementability**
 - **Cost**

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Causeway and Dike EE/CA

■ **Evaluation of effectiveness considers:**

- **Overall protection of human health and the environment**
- **Compliance with ARARs**
- **Long-term effectiveness**
- **Reduction of toxicity, mobility, or volume through treatment**
- **Short-term effectiveness**

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Causeway and Dike EE/CA

■ Evaluation of implementability considers:

- Technical feasibility
- Administrative feasibility
- Availability of services and materials
- State acceptance
- Community Acceptance

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Causeway and Dike EE/CA

■ Evaluation of cost considers:

- Capital cost (direct and indirect costs)
- Operation and maintenance cost

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Comparative Analysis of Alternatives

Nine Criteria	Capping with Hydraulic Barrier *	Capping with Composite Cover System	Excavation and Off-Site Disposal
Protects human health and environment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Meets Federal and State requirements	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Provides long-term protection	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Reduces mobility, toxicity or volume	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Provides short-term protection	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Can be implemented	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cost	\$5,000,000	\$8,000,000	\$10,000,000
State Agency Acceptance	To be determined after the public comment period.		
Community Acceptance	To be determined after the public comment period.		

Does not meet criteria Meets or exceeds criteria Partially meets criteria * Preferred alternative

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Causeway and Dike EE/CA

■ Recommended removal action alternative

- **Alternative 1 - Capping with hydraulic barrier**
 - Is protective of human health and the environment
 - Complies with ARARs
 - Provides long-term effectiveness
 - Reduces mobility, toxicity, or volume
 - Provides short-term effectiveness
 - Is easily implemented
 - Is cost-effective

version

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Causeway and Dike EE/CA

■ Schedule

- **Submit Draft EE/CA for regulatory agency review (February 23, 2000)**
- **Submit Final EE/CA for Public Comment Period (April 2000)**
- **Submit Removal Action Memorandum (May 2000)**

version

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OU2 - Indoor Air Monitoring

- **Five sampling rounds conducted to date**
- **First two rounds of samples collected in Building B-2**
- **Third, fourth, and fifth rounds of samples collected in various other occupied spaces within facility**

version

Building Leases Association

OU2 - Indoor Air Monitoring

■ Rounds 3 and 4 Results:

- Exceedances of CTDEP VC criteria for 1,1-DCE and vinyl chloride found in rounds 3 (October 1999) and 4 (December 1999) sampling
- Exceedances of criteria found in most locations sampled in Round 3 (exceedances in B-2, B-8, B-12, B-48, B-66)
- Round 4 results indicate exceedances in B-2, B-12, B-66
- No exceedances found in either sampling event in upper floors of B-1

VER-00

Bonding License #00000000

ROUND 3 RESULTS

Component	10-20-99		10-21-99		10-22-99		10-23-99		10-24-99		10-25-99	
	ppm	µg/m³	ppm	µg/m³	ppm	µg/m³	ppm	µg/m³	ppm	µg/m³	ppm	µg/m³
Methyl chloride	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10
1,1,1-Trichloroethane	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10
1,1,2-Trichloroethane	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10
Tetrachloroethane	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10
Trans-1,2-Dichloroethene	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10

Component	10-26-99		10-27-99		10-28-99		10-29-99		10-30-99		10-31-99	
	ppm	µg/m³	ppm	µg/m³	ppm	µg/m³	ppm	µg/m³	ppm	µg/m³	ppm	µg/m³
Methyl chloride	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10
1,1,1-Trichloroethane	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10
1,1,2-Trichloroethane	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10
Tetrachloroethane	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10
Trans-1,2-Dichloroethene	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10

Component	11-01-99		11-02-99		11-03-99		11-04-99		11-05-99		11-06-99	
	ppm	µg/m³	ppm	µg/m³	ppm	µg/m³	ppm	µg/m³	ppm	µg/m³	ppm	µg/m³
Methyl chloride	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10
1,1,1-Trichloroethane	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10
1,1,2-Trichloroethane	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10
Tetrachloroethane	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10
Trans-1,2-Dichloroethene	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10

ROUND 4 RESULTS

Component	12-01-99		12-02-99		12-03-99		12-04-99		12-05-99		12-06-99	
	ppm	µg/m³	ppm	µg/m³	ppm	µg/m³	ppm	µg/m³	ppm	µg/m³	ppm	µg/m³
Methyl chloride	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10
1,1,1-Trichloroethane	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10
1,1,2-Trichloroethane	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10
Tetrachloroethane	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10
Trans-1,2-Dichloroethene	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10

Component	12-07-99		12-08-99		12-09-99		12-10-99		12-11-99		12-12-99	
	ppm	µg/m³	ppm	µg/m³	ppm	µg/m³	ppm	µg/m³	ppm	µg/m³	ppm	µg/m³
Methyl chloride	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10
1,1,1-Trichloroethane	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10
1,1,2-Trichloroethane	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10
Tetrachloroethane	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10
Trans-1,2-Dichloroethene	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10	0.50	0.10

OU2 - Indoor Air Monitoring

■ Risk Assessment

- Screening level risk assessment completed (Rounds 1-3) to assess risks to current workers in buildings
- Risk calculations showed that under current usage, short term exposure (5 years or less) would not cause unacceptable risk to workers

version

Burlington Leases Associates

OU2 - Indoor Air Monitoring

■ Round 5 Results:

- Exceedances of CTDEP I/C criteria for 1,1-DCE and vinyl chloride
- Round 5 results indicate exceedances in B-2, B-9, and B-12
- Concentrations of 1,1-DCE in B-12 have increased by a factor of three since October 1999

version

Burlington Leases Associates

ROUND 5 RESULTS

Compound	B-2		B-9		B-12		B-13	
	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99
Vinyl Chloride	0.50	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1-DCE	0.50	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1,2,2-Tetrachloroethane	0.50	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1,1,2-Tetrachloroethane	0.50	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1,2,2-Tetrachloroethane	0.50	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U

Compound	B-2		B-9		B-12		B-13	
	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99
Vinyl Chloride	0.50	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1-DCE	0.50	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1,2,2-Tetrachloroethane	0.50	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1,1,2-Tetrachloroethane	0.50	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1,2,2-Tetrachloroethane	0.50	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U

Compound	B-2		B-9		B-12	
	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99
Vinyl Chloride	0.50	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1-DCE	0.50	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1,2,2-Tetrachloroethane	0.50	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1,1,2-Tetrachloroethane	0.50	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1,2,2-Tetrachloroethane	0.50	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U

Standard values indicate concentrations of DCEC

* - CTDEP Substituted Chemical Tables

for 7 days Concentration (DCEC)

W - If a value of 0 is reported

do not indicate a limit

OU2 - Indoor Air Monitoring

■ **Ongoing Actions:**

- Monthly sampling program to continue through July 2000
- During December 1999 meeting with Connecticut Department of Health, DOH concurred with approach for risk assessment and future sampling
- Additional risk assessment to evaluate results planned at end of 6 months of sampling, or sooner if results warrant re-evaluation

Version

Harding Lawson Associates

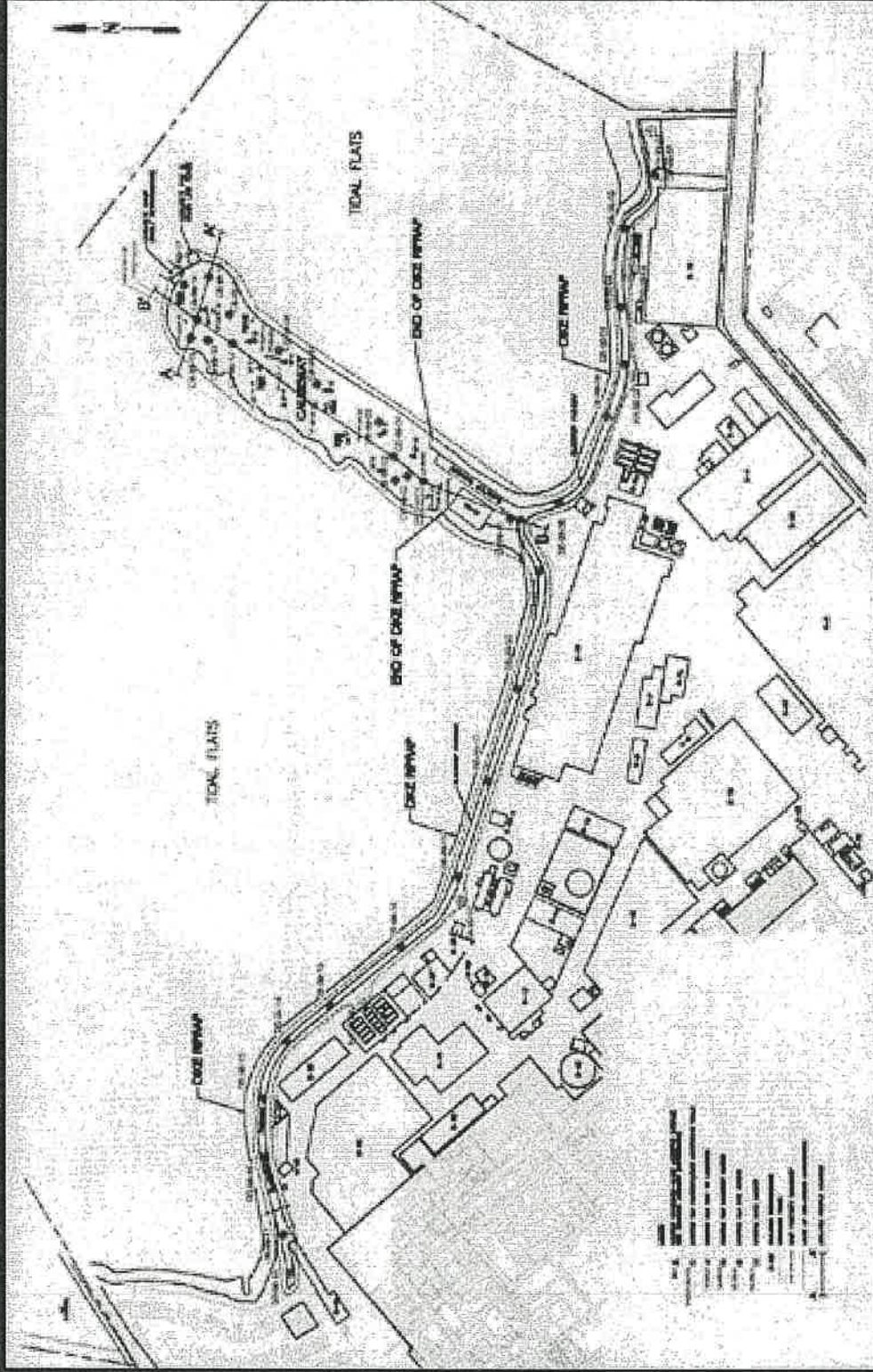
Community Relations Support

- Public Presentation during EE/CA public comment period
- Fact sheets on current SAEP projects will be prepared summarizing recent significant documents (RI Report; OU 2 Pre-Design Investigation Report and EE/CA; Causeway Pre-Design Investigation Report and EE/CA)
- Administrative Record will be updated as many documents become finalized in the spring and summer of 2000

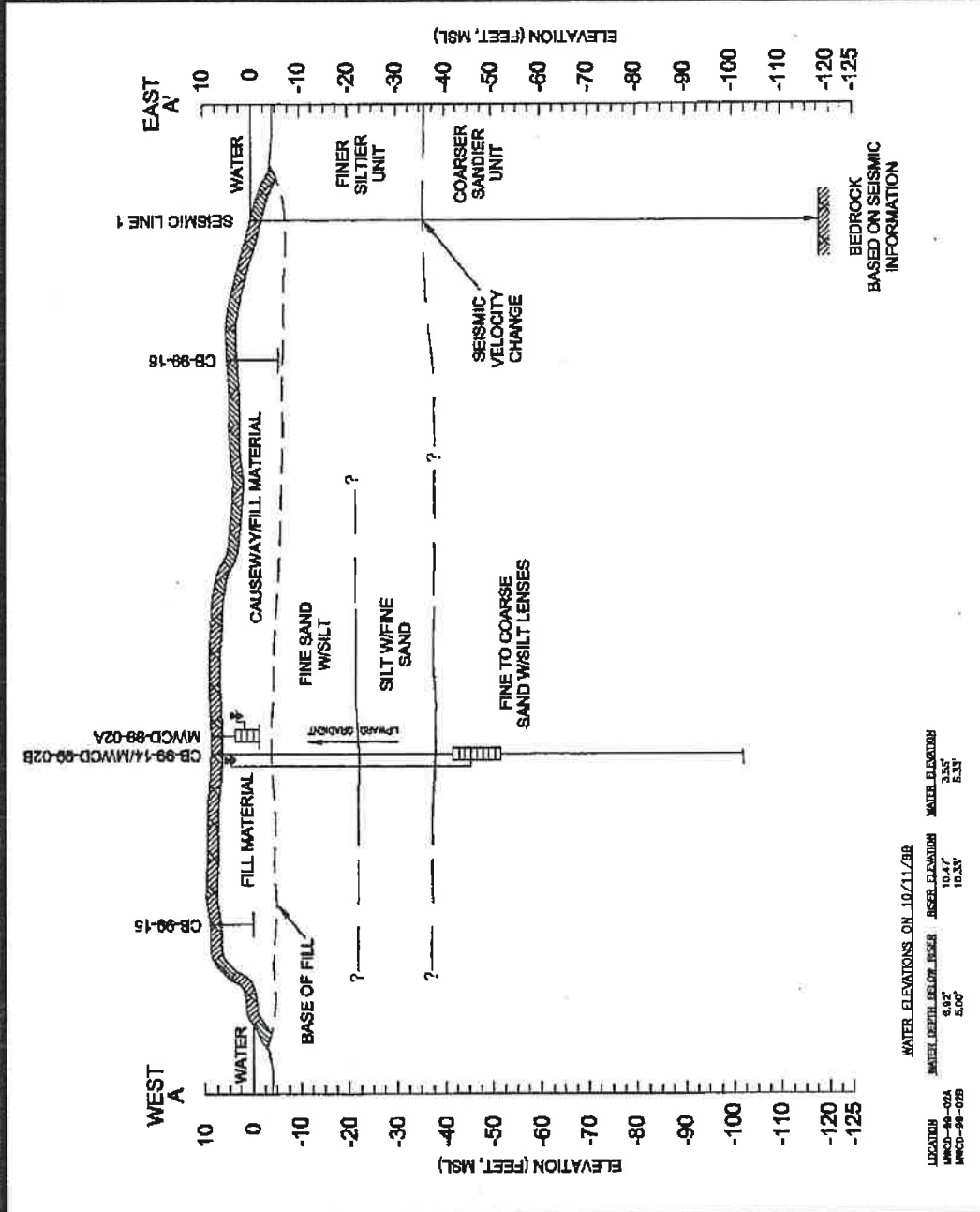
Version

Harding Lawson Associates

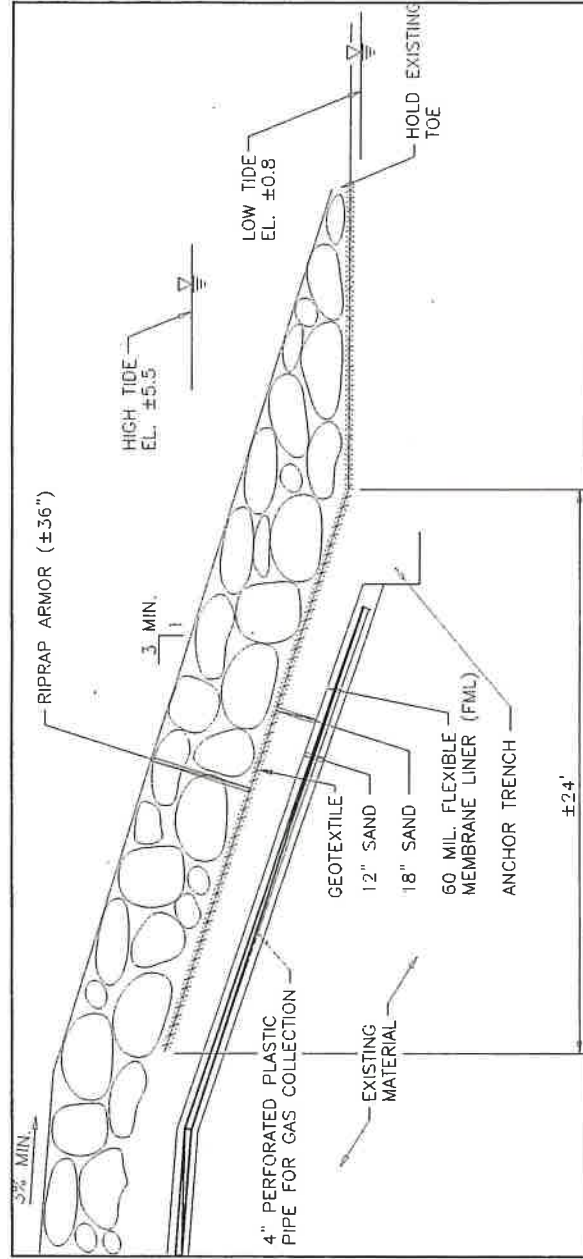
Causeway Exploration Locations



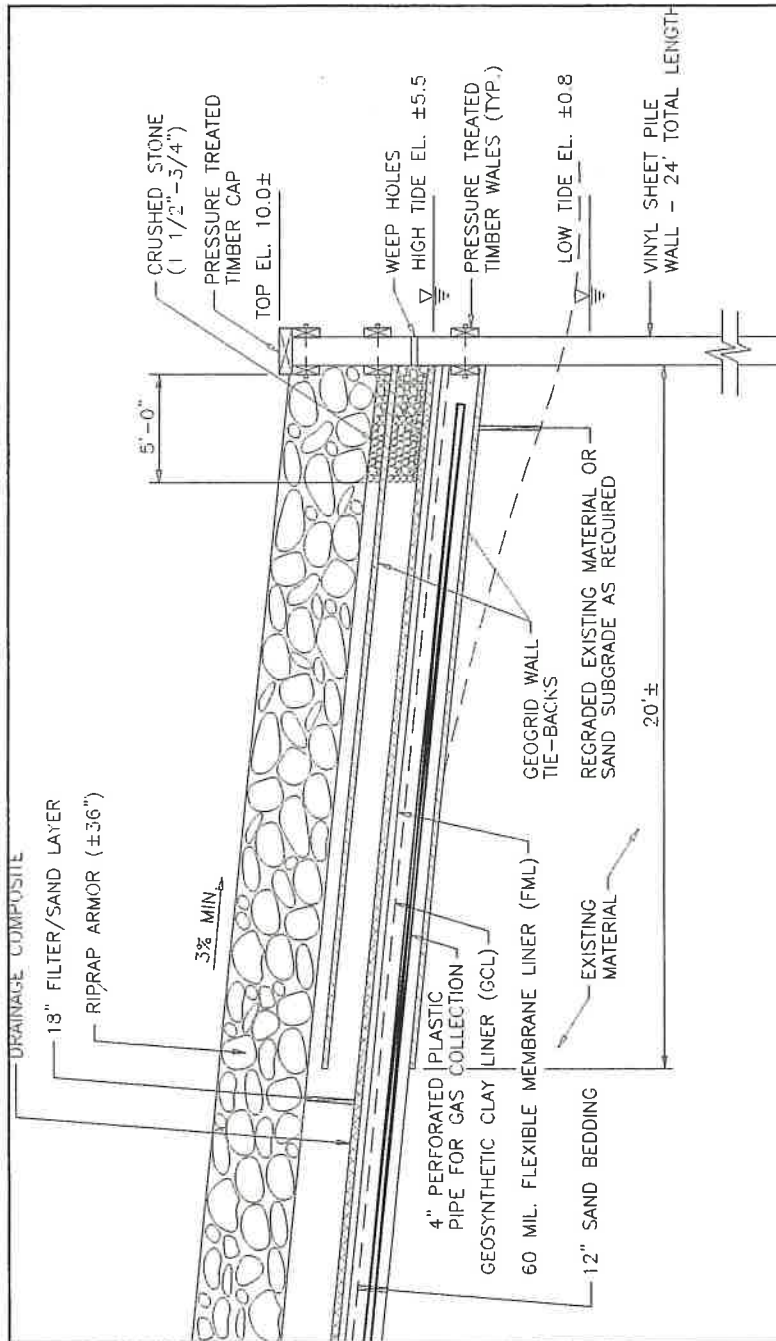
Interpretive Geologic Profile Cross-Section A-A'



Alternative 1 - Cap with Hydraulic Barrier



Alternative 2 - Cap with Composite System



Comparative Analysis of Alternatives

Nine Criteria	Capping with Hydraulic Barrier *	Capping with Composite Cover System	Excavation and Off-Site Disposal
Protects human health and environment	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Meets Federal and State requirements	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Provides long-term protection	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Reduces mobility, toxicity of volume	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Provides short-term protection	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Can be implemented	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Cost	\$6,500,000	\$6,700,000	\$18,300,000
State Agency Acceptance	To be determined after the public comment period		
Community Acceptance	To be determined after the public comment period		

Does not meet criteria
 Meets or exceeds criteria
 Partially meets criteria

Prepared by:

Hartig Lawson Associates

ROUND 3 RESULTS

SITE ID: IA-B1-01		IA-B1-01		IA-B1-02		IA-B1-03		IA-ML-01		IA-ML-02		IA-B2-01	
SAMPLE ID: 419		23988		10790		94945		20947		25246		10/21/99	
DATE SAMPLED: 10/21/99		10/21/99		10/21/99		10/21/99		10/21/99		10/21/99		10/21/99	
Compound	RSR*	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv
Vinyl chloride	0.019	0.022	0.020 U	0.020 U	0.032	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.020 U	0.210	0.020 U
1,1-Dichloroethene	0.02	0.027	0.020 U	0.020 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.038	0.038
1,1,1-Trichloroethane	266	0.510	0.140	0.110	0.350	0.340	0.340	0.340	0.340	0.340	0.340	0.190	0.190
Trichloroethene	0.92	0.260	0.055	0.043	0.180	0.180	0.180	0.180	0.180	0.180	0.180	0.110	0.110
Tetrachloroethene	1.61	0.089	0.081	0.055	0.082	0.055	0.082	0.082	0.082	0.082	0.082	0.047	0.047

SITE ID: IA-B12-01		IA-B12-01D		IA-B12-02		IA-B9-01		IA-B48-01		IA-B65-01	
SAMPLE ID: 9549		12333		13847		12952		12703		12954	
DATE SAMPLED: 10/21/99		10/21/99		10/21/99		10/21/99		10/21/99		10/21/99	
Compound	RSR*	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv
Vinyl chloride	0.019	0.041	0.020	0.019 U	0.022	0.022	0.022	0.033	0.033	0.210	0.210
1,1-Dichloroethene	0.02	0.210	0.077	0.140	0.023	0.023	0.023	0.019 U	0.019 U	0.038	0.038
1,1,1-Trichloroethane	266	0.540	0.460	0.420	0.480	0.480	0.480	1.200	1.200	0.190	0.190
Trichloroethene	0.92	0.095	0.120	0.065	0.180	0.180	0.180	0.100	0.100	0.110	0.110
Tetrachloroethene	1.61	0.096	0.110	0.120	0.560	0.560	0.560	0.160	0.160	0.047	0.047

SITE ID: IA-B65-01D		IA-BKGD-04		IA-BKGD-05		IA-BTB-03	
SAMPLE ID: 12954		30842		1054		9936	
DATE SAMPLED: 10/21/99		10/21/99		10/21/99		10/21/99	
Compound	RSR*	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv
Vinyl chloride	0.019	0.22	0.018 U	0.019 U	0.010 U	0.010 U	0.010 U
1,1-Dichloroethene	0.02	0.039	0.018 U	0.019 U	0.010 U	0.010 U	0.010 U
1,1,1-Trichloroethane	266	0.19	0.092 U	0.019 U	0.050 U	0.050 U	0.050 U
Trichloroethene	0.92	0.11	0.037 U	0.042	0.020 U	0.020 U	0.020 U
Tetrachloroethene	1.61	0.046	0.084	0.063	0.020 U	0.020 U	0.020 U

Shaded values indicate exceedance of RSR
 RSR = CTDEP Remediation Standard
 Regulation (RSR) for Industrial/Commercial
 U - Not Detected at a concentration
 above the detection limit

ROUND 4 RESULTS

SITE ID: IA-ML-01		IA-ML-02		IA-B1-01		IA-B1-02		IA-B1-03		IA-B9-01	
SAMPLE ID: 9912135A-04A		9912135A-05A		9912135B-01A		9912135B-02A		9912135B-03A		9912135B-06A	
DATE SAMPLED: 12/7/99		12/7/99		12/7/99		12/7/99		12/7/99		12/7/99	
Compound	RSR*	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv
Vinyl chloride	0.019	0.021 U	0.021 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.021 U	0.021 U	0.021 U
1,1-Dichloroethene	0.02	0.021 U	0.021 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.021 U	0.021 U	0.021 U
1,1,1-Trichloroethane	266	0.200	0.120	0.180	0.140	0.150	0.140	0.150	0.530	0.530	0.530
Trichloroethene	0.92	0.200	0.085	0.047	0.075	0.120	0.075	0.120	0.042 U	0.042 U	0.042 U
Tetrachloroethene	1.61	0.140	0.049	0.072	0.063	0.110	0.063	0.110	0.380	0.380	0.380

SITE ID: IA-B65-01		IA-B12-01		IA-B12-01D		IA-B12-02		IA-B2-01		IA-BKGD-06	
SAMPLE ID: 9912135B-07A		9912135B-08A		9912135A-05A		9912135B-10A		9912135B-11A		9912135B-12A	
DATE SAMPLED: 12/7/99		12/7/99		12/7/99		12/7/99		12/7/99		12/7/99	
Compound	RSR*	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv
Vinyl chloride	0.019	0.130	0.020 U	0.021 U	0.023	0.021 U	0.021 U	0.021 U	0.019 U	0.019 U	0.019 U
1,1-Dichloroethene	0.02	0.076	0.370	0.380	0.320	0.086	0.086	0.086	0.019 U	0.019 U	0.019 U
1,1,1-Trichloroethane	266	0.230	0.660	0.670	0.690	0.550	0.550	0.550	0.096 U	0.096 U	0.096 U
Trichloroethene	0.92	0.290	0.180	0.160	0.130	0.630	0.130	0.630	0.038 U	0.038 U	0.038 U
Tetrachloroethene	1.61	0.071	0.100	0.064	0.080	0.075	0.080	0.075	0.041	0.041	0.041

SITE ID: IA-BKGD-06D		IA-BKGD-07		IA-TB-01	
SAMPLE ID: 9912135A-05A		9912135B-13A		9912135B-14A	
DATE SAMPLED: 12/7/99		12/7/99		12/7/99	
Compound	RSR*	ppbv	ppbv	ppbv	ppbv
Vinyl chloride	0.019	0.019 U	0.020 U	0.010 U	0.010 U
1,1-Dichloroethene	0.02	0.019 U	0.020 U	0.010 U	0.010 U
1,1,1-Trichloroethane	266	0.096 U	0.100 U	0.050 U	0.050 U
Trichloroethene	0.92	0.038 U	0.040 U	0.020 U	0.020 U
Tetrachloroethene		0.041	0.042	0.020 U	0.020 U

Shaded values indicate exceedance of RSR

RSR = CTDEP Remediation Standard
Regulation (RSR) for Industrial/Commercial

U - Not Detected at a concentration
above the detection limit

ROUND 5 RESULTS

SITE ID: IA-ML-01		IA-ML-02		IA-B1-01		IA-B1-02		IA-B1-03		IA-B9-01	
SAMPLE ID: 0002138-05A		0002138-06A		0002138-03A		0002138-01A		0002138-02A		0002138-07A	
DATE SAMPLED: 2/8/00		2/8/00		2/8/00		2/8/00		2/8/00		2/8/00	
Compound	IATC*	ppbv		ppbv		ppbv		ppbv		ppbv	
Vinyl chloride	0.019	0.019 U	0.019 U	0.019 U	0.018 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U
1,1-Dichloroethene	0.02	0.021	0.019 U	0.019 U	0.018 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.320
1,1,1-Trichloroethane	266	0.200	0.240	0.095	0.250	0.095	0.250	0.120	0.120	0.120	0.690
Trichloroethene	0.92	0.095	0.160	0.037 U	0.085	0.037 U	0.085	0.065	0.065	0.065	0.150
Tetrachloroethene	1.61	0.037 U	0.055	0.037 U	0.036 U	0.037 U	0.036 U	0.380	0.380	0.380	1.500

SITE ID: IA-B65-01		IA-B12-01		IA-B12-01D		IA-B12-02		IA-B2-01		IA-BKGD-07	
SAMPLE ID: 0002138-09A		0002138-12A		0002138-13A		0002138-08A		0002138-04A		0002138-10A	
DATE SAMPLED: 2/8/00		2/8/00		2/8/00		2/8/00		2/8/00		2/8/00	
Compound	IATC*	ppbv		ppbv		ppbv		ppbv		ppbv	
Vinyl chloride	0.019	0.019 U	0.035	0.032	0.036	0.032	0.036	0.019 U	0.019 U	0.019 U	0.017 U
1,1-Dichloroethene	0.02	0.019 U	0.680	0.720	0.610	0.720	0.610	0.088	0.088	0.088	0.017 U
1,1,1-Trichloroethane	266	0.120	0.770	0.810	0.800	0.810	0.800	0.660	0.660	0.660	0.084 U
Trichloroethene	0.92	0.086	0.230	0.240	0.180	0.240	0.180	0.370	0.370	0.370	0.034 U
Tetrachloroethene	1.61	0.038 U	0.100	0.095	0.052	0.095	0.052	0.039	0.039	0.039	0.034 U

SITE ID: IA-BKGD-09		IA-TB-05	
SAMPLE ID: 0002138-11A		0002138-14A	
DATE SAMPLED: 2/8/00		2/8/00	
Compound	IATC*	ppbv	
Vinyl chloride	0.019	0.017 U	0.010 U
1,1-Dichloroethene	0.02	0.017 U	0.010 U
1,1,1-Trichloroethane	266	0.086 U	0.050 U
Trichloroethene	0.92	0.034 U	0.061
Tetrachloroethene	1.61	0.034 U	0.470

Shaded values indicate exceedance of IATC

* - CTDEP Industrial/Commercial Indoor Air Target Concentrations (I/C IATC)

U - Not Detected at a concentration above the detection limit