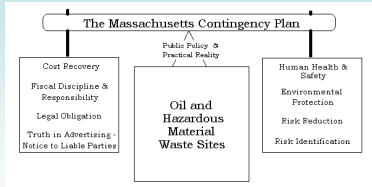


## Massachusetts Waste Site Clean-up Program: A 21E Overview & What's New




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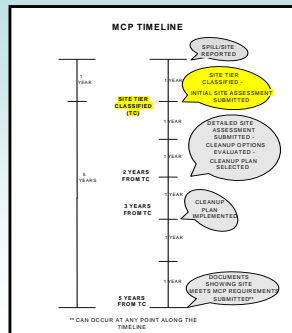
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## Tier Classification & Phased Process

- Sites beyond the one year timeline (following initial notification)
- Complete Phase I Initial Site Assessment
- Rank by complexity
  - # of sources
  - potential threat/risk
- Tier I or Tier II




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## Preliminary Response Actions SUBPART D: PRELIMINARY RESPONSE ACTIONS AND RISK REDUCTION MEASURES:

- Immediate Response Actions,
- Release Abatement Measures,
- Utility-related Abatement Measures




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## Risk Reduction Measures

- **Release Abatement Measures (RAM)**
  - Optional actions to reduce risk and/or lower future cleanup costs
- **Limited Removal Actions (LRA)**
  - Removal of <100 cubic yards oil / waste oil impacted soil
  - Removal of < 20 cubic yards hazardous material or mix
  - Performed within 120 day of knowledge
  - LSP not required
  - No impact to groundwater
- **Result in No Significant Risk and Site Closure or ...**



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## Phase I Initial Site Assessment

- **Based on information known at time**
  - Often limited
  - Few monitoring points / samples taken
  - What is known at the time?
    - Receptors
    - Contaminants
    - Pathways
- **Provides basis for scoring Site**
  - Numerical Ranking System
    - Tier 1 – requires permit
    - Tier 2 – no permit



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## SUBPART H: COMPREHENSIVE RESPONSE ACTIONS

Comprehensive Response Actions shall be performed in sequential phases. The phases of Comprehensive Response Actions consist of:

- (a) Phase II - Comprehensive Site Assessment;
- (b) Phase III - Identification and Selection of Comprehensive Remedial Action Alternatives;
- (c) Phase IV - Implementation of the Selected Remedial Action Alternative; and
- (d) Phase V - Operation, Maintenance and/or Monitoring

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## Deadlines for Submittals

- RP, PRP or Other Person undertaking response actions at a Tier II disposal site shall submit the following documents to the Department by the following deadlines:
- (a) a scope of work for a Phase II - Comprehensive Site Assessment pursuant to 310 CMR 40.0834 prior to the implementation of Phase II field work, unless the Phase II field work had been implemented prior to Tier Classification;
- (b) a Phase II Report, and, if applicable, a Phase III Remedial Action Plan, within two years of the effective date of Tier Classification;
- (c) a Phase IV Remedy Implementation Plan within three years of the effective date of Tier Classification; and
- (d) a Response Action Outcome Statement pursuant to 310 CMR 40.1000 within five years of the effective date of Tier Classification.

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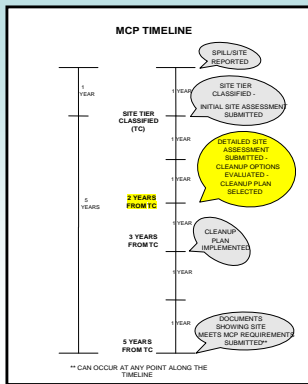
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## Phased Process



- Phase II  
Comprehensive Site Assessment
- Phase III  
Remedial Action Plan

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## Phase II Comprehensive Site Assessment

- Determine & document:
  - Nature & extent of contamination
    - Types of contaminants
    - Where are they located ?
    - Horizontal / vertical extent
    - How far has it gone?
    - How deep is it?
  - Receptors & pathways
    - Nearby residences, schools, wetlands, surface water?
    - Indoor air issues, private wells ?
  - Risk posed by the Site
    - Human health / public safety & welfare
    - Environment

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## Protocol for Community Specific Environmental Health Assessments

Prepared By:  
Bureau of Environmental Health Assessment  
Massachusetts Department of Public Health

November 1992; Revised August 1998

During the past several years public awareness and concern over the potential health effects resulting from environmental exposures has heightened. There are currently 32 National Priority List or Superfund sites and 800 additional sites designated by the United States Environmental Protection Agency (USEPA) under investigation in Massachusetts. Further, as of 1990, the Massachusetts Department of Environmental Protection (MDEP) has more than 4,200 confirmed or suspected hazardous waste sites being assessed or cleaned up in the state. Concerns over these and other areas suspected to be environmentally contaminated result in numerous requests (i.e., several hundred per year) to the BEHA for toxicological and epidemiologic community health assessments. These requests are made by citizen groups, state legislators, local boards of health, and the media, as well as other state agencies

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## Grace guilty of tainting Woburn water - W.R. Grace and Co., Woburn, Massachusetts

Science News, August 16, 1986

Two years ago, a low-cost epidemiologic survey conducted by the residents of Woburn, Mass. (under the guidance of researchers at the Harvard University School of Public Health in Boston) showed that Woburn's leukemia rate was 24 times the national average. The risk of leukemia was highest, according to the researchers, in homes receiving the largest proportion of their drinking water from two city wells that previously had been shown to be heavily contaminated with toxic chemicals, including chloroform and trichloroethylene -- known carcinogens (SN:2/18/84,p.104). There was also an elevated risk of certain birth defects among those whose homes got more than 20 percent of their drinking water from the two wells.

On July 28 a Boston jury found W.R. Grace & Co. of New York City guilty of contaminating those wells with chemical wastes. The Chicago-based Beatrice Cos. was cleared of charges that its hazardous wastes also contaminated the well water.

The case was brought by the families of seven leukemia victims (six of whom died) and of children with several other illnesses. These families charged that the diseases resulted from the water's chemical contamination. Still to be determined by the jury is whether there is sufficient evidence to link the observed contamination with the plaintiffs' health claims.

W.R. Grace's only response to the initial jury finding was a formal statement saying it was "disappointed" but confident it would be "fully vindicated during the next phase [of the trial] which will deal with the medical aspects."

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## Phase II Possible Outcomes

### Cleanup Complete

- Site Does Not Pose Significant Risk
  
- Significant Risk, more cleanup needed
  - Conduct Phase III Feasibility Evaluation
  - Submit results concurrently with the Phase II



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## Phase III Feasibility Evaluation

- **Evaluation to determine what remedial actions could work at the Site**
  - Compare cost, effectiveness, implementability, etc.
- **Remedial Action Plan documents the evaluation**
  - What, if anything, can be done ?
- **Phase III Conclusion**
  - Permanent Solution Feasible
    - on to Phase IV
  - Permanent Solution Not Feasible
    - Temporary Solution




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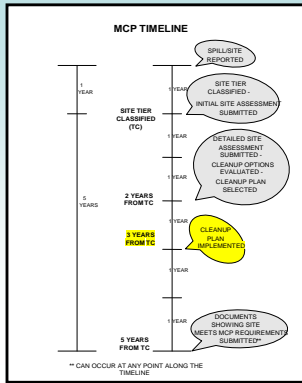
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## Phase IV Remedy Implementation



- **Submit a Remedy Implementation Plan**
- **Perform the work**
- **Submit a Final Inspection & Completion Report**




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## Phase IV Remedy Implementation

- **Phase IV Remedy Implementation Plan**
  - Remedy design parameters & specifications
  - Schedule
  - Operation, maintenance & monitoring plan
- **Phase IV Final Inspection & Completion Report**
  - Documents that the final inspection was conducted
  - Remedy implemented & operating as designed
  - Documents the operation, maintenance &/or monitoring required (if any)




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## Phase V Remedy Operation

- When operation, maintenance &/or monitoring of the remedial action is required
  - Up until 5-year deadline to achieve endpoint
  - Includes operating an active treatment system or monitoring natural processes
  - Inspection and monitoring reports required every 6 months




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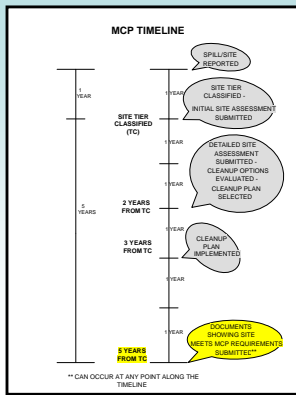
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## Cleanup Levels & Process Endpoints



- Cleanup level based on site use
  - Current / Foreseeable
  - Residential / Industrial
  - 32 % to background
- Protective of human health & environment
- Allows for land use/institutional controls
  - Activity & Use Limitations
    - Deed restrictions
- Operating a Remedy




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## Cleanup Levels & Process Endpoints

- Response Action Outcome (RAO)
  - Can be achieved at any time after notification
    - 73% of closures occur in year one
  - Permanent Solution
    - May include deed restriction limiting Site activities/uses – Activity and Use Limitation (7% of all)
    - No further evaluation required
  - Temporary Solution (less than 3%)
    - Risk has been reduced, but
    - Demonstrate it is not feasible to attain Permanent Solution
    - May involve operating a remedy
    - Requires re-evaluation every five years




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## Cleanup Levels & Process Endpoints

- **Remedy Operation Status**
  - Operating with intent of achieving Permanent Solution
  - Beyond five years
  - Inspection & Monitoring reports every six months
- **Downgradient Property Status**
  - Document that the source of contamination is from an upgradient site
  - Certain requirements – provision of access



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## Ensuring Compliance

- **Provide direct oversight**
  - time-critical conditions
  - as deemed necessary
  - authority to perform/contract response actions
- **Conduct Audits**
  - 20 % of all Sites annually
- **Enforcement**
  - notice of noncompliance, orders, penalties



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## MassDEP Web Site



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## MassDEP Website - File Viewer



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## Facilitating Brownfields Redevelopment

- **Brownfields Act of 1998**
  - Amended c. 21E
  - Liability protection for qualified parties
    - Exemption for municipal tax takings
  - Created potential funding sources for assessment & cleanup
    - Low interest loans (e.g., MassDevelopment)
    - Grants (e.g. USEPA Region 1)
    - Tax Incentives (e.g. Department of Revenue)

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## Westborough Commons



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Gardner Kilby Hammond, Worcester



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Gardner Kilby Hammond, Worcester



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For Further Information  
Websites

**MassDEP Website:** [www.mass.gov/dep](http://www.mass.gov/dep)  
– Regional Service Center Information

**Homeowner Oil Heating Insurance**  
[www.mass.gov/dep/cleanup/helpforth.htm](http://www.mass.gov/dep/cleanup/helpforth.htm)

**Mercury Information:**  
[www.mass.gov/dep/toxics/stypes/hgres.htm](http://www.mass.gov/dep/toxics/stypes/hgres.htm)

• **USEPA:** [www.epa.gov/](http://www.epa.gov/)

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Questions ???



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