START

Final

Meeting Minutes Transmittal/Approval
Unit Manager's Meeting: 200-BP-1 Operable Unit
740 Stevens Center, Room 1200, Richland, Washington
June 24, 1993

FROM/APPROVAL: R W McLeod for Paul Pak Date 7-29-93
Paul M. Pak, 200-BP-1 Unit Manager, RL (A5-19)

APPROVAL: Paul R. Beaver Date 7-29-93
Paul R. Beaver, 200-BP-1 Unit Manager, EPA (B5-01)

APPROVAL: Nancy Uziemblo Date 7/29/93
Nancy Uziemblo, 200-BP-1 Unit Manager, WA Department of Ecology

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

Attachment #1	-	Meeting Summary/Summary of Commitments and Agreements
Attachment #2	-	Attendance List
Attachment #3	-	Agenda for the Meeting
Attachment #4	-	Status of Action Items
Attachment #5	-	200 NPL Agreement/Change Control Form 200BP1-1
Attachment #6	-	Results of 200-BP-1 Feasibility Study

Prepared by: Kay Kimmel Date: 7/29/93
Suzanne Clarke, Kay Kimmel, GSSC (A4-35)

Concurrence by: Mark A. Buckmaster Date: 7/29/93
Mark Buckmaster, WHC RI Coordinator (H6-03)

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Attachment #1

Meeting Summary and Summary of Commitments and Agreements
Unit Manager's Meeting: 200-BP-1 Operable Unit
June 24, 1993

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1. **SIGNING OF THE MAY 200-BP-1 MEETING MINUTES:**

   Minutes from the May meeting were reviewed and approved with no changes.

2. **ACTION ITEM UPDATE: (See Attachment 4 for status)**

   No action items open.

3. **NEW ACTION ITEMS (INITIATED June 24, 1993):**

   No new action items were initiated.

4. **INFORMATION ITEMS**

   - Remedial Investigation Status - Mark Buckmaster presented the status of the 200-BP-1 RI (see Attachment #3).

   - 200 NPL Agreement/Change Control Form 200BP1-1 was signed (see Attachment #5).

   - FS Status - The document, *Results of 200-BP-1 Feasibility Study*, was provided as a handout (see Attachment #6).

   - A preliminary discussion to evaluate the need for future groundwater sampling pertaining to specific radionuclides will be held, specifically to determine whether reducing the analyte list and number of wells to be sampled can be justified.

200-BP-1 Operable Unit Manager's Meeting
Official Attendance Record
June 24, 1993

Please print clearly and use black ink

PRINTED NAME	ORGANIZATION	O.U. ROLE	TELEPHONE
KAY KIMMEL	MACTEC (D&M)	RL SUPPORT	509-376-1985
Paul Beaver	EPA	Unit Manager	376-8665
NANCY UZIEMBLO	Ecology	UM	B63014
David Holland	Ecology	U Mgr / Suppt	736 3027
Mike Mahoney	COE/DOE		~~736~~ 736-9580
Paul Pak	DOE-RL	UM	376-4798
Pamela Innis	EPA	Unit Mgr.	376-4919
Mark Buckmaster	WHC	RI Coor.	376-1792
Doug Dunster	Golder Assoc.	FS author	206-883-0777
P.K. BROCKMAN	SAIC	PROGRAM MGR	7831446
C.D. WITTREICH	WHC		376-1862
R. I. Watkins	KEH	Barrier Design	376-3383
J. Consoit	GSSC	RL Support	3765011
G.S. JONES	WHC	ER PROGRAM OFFICE	Z-28M
Jay Bradley	WHC	~~Project Manager~~	376-3382
Audree DeAngeles	PRC	EPA Support	206 624-2692
Brian Drost	USGS	" "	206-593-6510

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Attachment #3

200-BP-1 UNIT MANAGERS MEETING AGENDA
JUNE 24, 1993
1:00-3:00 PM
740 STEVENS, ROOM 1200

Introduction:

Status:

Action Items:

Work Plan Changes:

Remedial Investigation:

- o RI Report - Comment resolution meeting was held June 10, 1993. Comments are currently being incorporated and a draft of the changes will be reviewed prior to finalizing the document.
- o Investigation Derived Waste - NPL Agreement Form

Issues:

- o Prototype Barrier Discussion
  - Public review of the Treatability Test Plan will be completed July 6, 1993.
  - Definitive Design: KEH has submitted the design and construction specifications to WHC for review. The design should be finalized by the end of July.
  - Draft Constructability Report: TPA Milestone M-15-02E would be changed to a target completion date of April 1994.

Feasibility Study

- o The FS is on schedule for submittal June 30, 1993 (TPA Milestone M-15-02E).
- o FS overview

Agreements and Commitments:

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Attachment #4

Unit Manager's Meeting: 200-BP-1 Operable Unit
June 24, 1993

Status of Action Items

NO ACTION ITEMS

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Control Number	200 NPL Agreement/Change Control Form	Date Submitted
200BP1-1	__ Change X Agreement __ Information Operable Unit(s) 200-BP-1	June 24, 1993 Date Approved 6/24/93

Document Number & Title:	Date Document Last Issued
WHC-CM-7-7, Environmental Investigations and Site Characterization Manual, EII 4.3	February 16, 1993

Originator	Phone
M. A. Buckmaster 6/15/93	376-1792

Summary Description

Disposal of Investigation Derived Waste will be completed prior to the 200-BP-1 source ROD. Waste will be dispositioned as follows:

1. Approximately 200 drums of trash will be compacted, resulting in approximately 50 drums. Disposal will be in the low-level burial ground.

2. Approximately 100 drums of soil/trash mix have been void filled and will be disposed of in the low-level burial ground.

3. Approximately 75 drums of high activity soils will be void filled and disposed of in the low-level burial ground.

4. Approximately 17-18 drums of decon water will be solidified and disposed of in in the low-level burial grounds.

Note: All waste has been designated as low-level rad.

Justification and Impact of Change

A cost savings will occur due to eliminating weekly inspections.
In addition, ALARA principles will be implemented by eliminating worker radiological exposure during the inspections.

Mark A. Buckmaster 6/24/93
M.A. Buckmaster
WHC/RI Coor

P. M. Pak 6/24/93
DOE Unit Manager Date

P. R. Beaver - EPA 6/24/93
Lead Regulatory Unit Manager Date

Per Action Plan for Implementation of the Hanford Consent Order and Compliance Agreement Section 9.3

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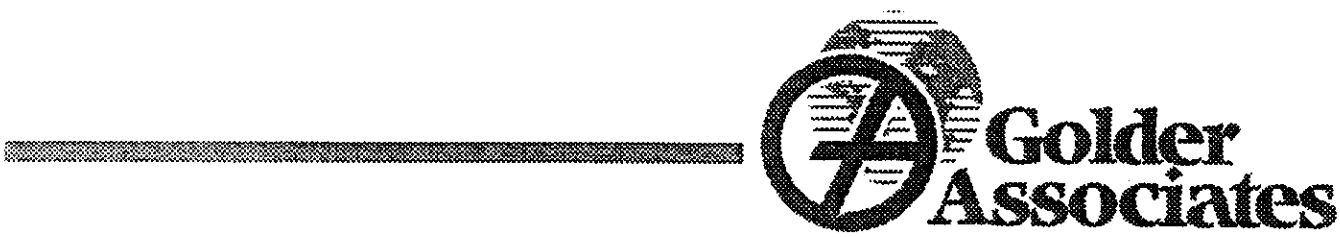
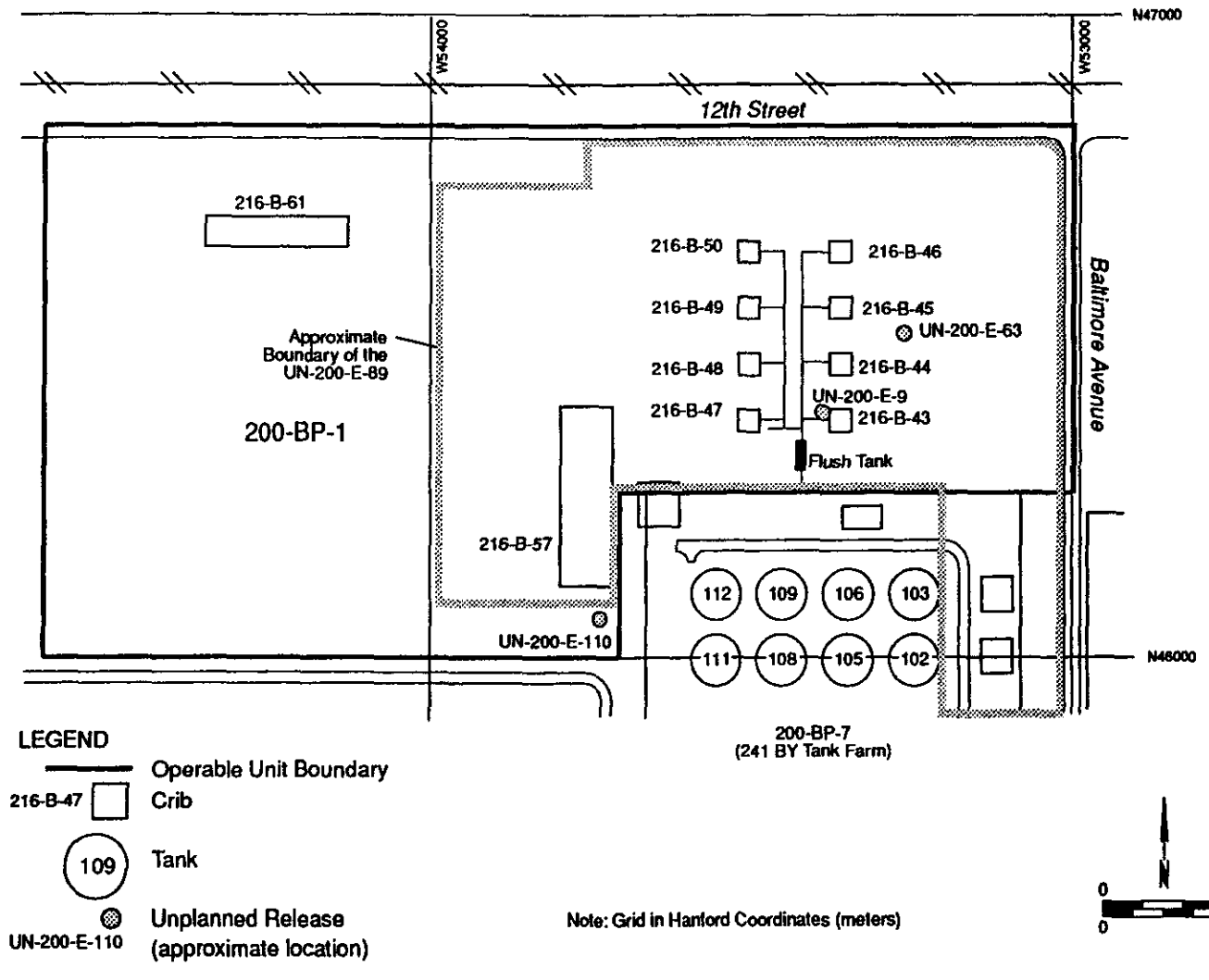
Results of 200-BP-1 Feasibility Study

June 24, 1993



The 200-BP-1 Operable Unit



Summary of Phase I RI and Baseline Risk Assessment

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- **Operable unit layout**
  - Cribs 216-B-43 through -50; 216-B-57; 216-B-61
  - Four unplanned releases
  - Clean soil cover, 18 to 24 inches thick
  - Near surface soils
  - Infiltration gravels/soils

Summary of Phase I RI and Baseline Risk Assessment - Cont'd

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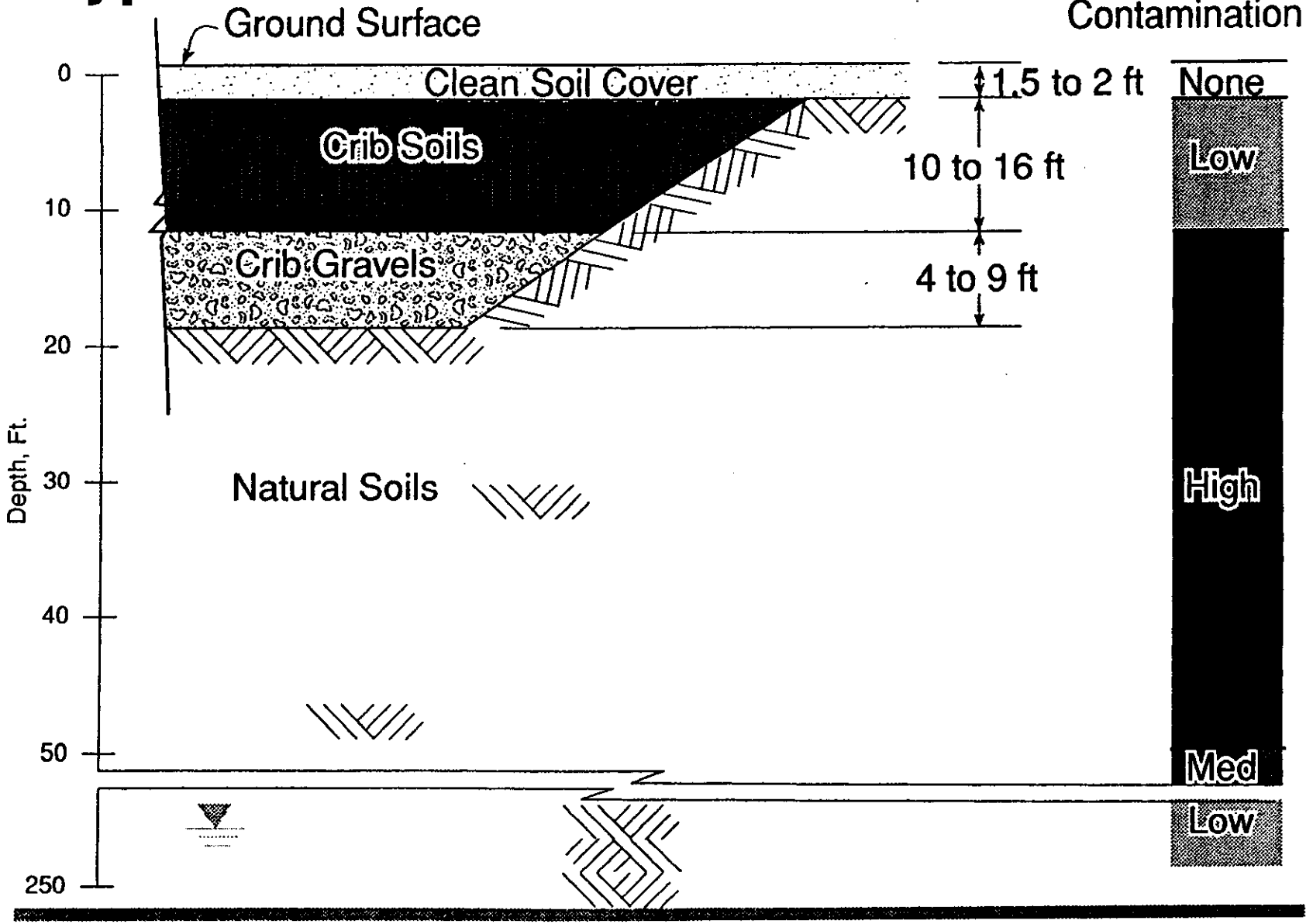
- **Nature and extent of contamination**
  - Species with low mobility (high retardation) and:
    - Short half-lives: Cesium-137, Strontium-90, Thorium-228
    - Intermediate half-lives: Radium-228
    - Long half-lives: Plutonium-239/240
  - Species with intermediate mobility and:
    - Long half-lives: total Uranium
  - Species with high mobility: Nitrate, Cobalt-60, Technetium-99

Typical Crib Section



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Summary of Phase I RI and Baseline Risk Assessment - Cont'd

- **Baseline risk assessment**
  - Current risk: Less than 10^{-6} Risk with clean soil cover and institutional controls in place for all pathways: Soil ingestion, Inhalation, External exposure
  - Future risk exceeding 10^{-6} (LICR):
    - Soil ingestion/external exposure from soils exposed at ground surface:

      Near surface soils: Cesium-137, Radium-226, Thorium-228

      Infiltration gravels/soils: Cobalt-60, Cesium-137, Radium-226, Thorium-228, Strontium-90, total Uranium, Plutonium-239/240

    - Groundwater ingestion: Nitrate, Cobalt-60, Technetium-99

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Remedial Action Objectives for the 200-BP-1 Operable Unit

- Limit human exposure to near surface and highly contaminated subsurface soils
- Limit biotic intrusion into near surface and highly contaminated subsurface soils
- Limit future impacts to groundwater by minimizing infiltration
- Take into consideration the proximity of the 241-BY Tank Farm in remedy selection

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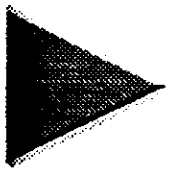

Alternatives Retained for Detailed Analysis

- No Action
- Institutional Controls
- Biointrusion Barrier
- Modified RCRA Barrier
- Hanford Barrier
- Excavation, Soil Washing and Disposal
- Excavation, Washing, Vitrification and Disposal
- Excavation, Fixation and Disposal
- Excavation and Disposal
- In-Situ Fixation

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Common Evaluation Elements

- Overall Protection of Human Health and the Environment
- Compliance with ARARs
- Long-Term Effectiveness and Permanence
  - Barrier Alternatives
  - Excavation Alternatives
- Short-Term Effectiveness

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Overall Protection of Human Health and the Environment

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- All alternatives (except No Action) provide some degree of long-term effectiveness
- Significant protection provided by Institutional Controls (included with all alternatives except No Action)
- Major difference is in short-term effectiveness related to potential for worker radiation exposure associated with excavation alternatives

Compliance with ARARS

Current discharges to groundwater		
Contaminant	**MTCA B**	**Drinking Water MCLs current/proposed**
technetium-99	35	900/3790
cobalt-60	3.1	100/218
nitrate	45	45
Future discharges to groundwater		
Contaminant	**MTCA B**	**Drinking Water MCLs current/proposed**
uranium	1.6	–/30
plutonium 239+240	0.2	15/65

Potential ARARS Related to Long-Term Performance

- 40 CFR 191 - current standard of 1,000 years -- proposed 10,000 years
- 40 CFR 192 - no less than 200, designed for up to 1,000 years
- DOE Order 5400.5 - TBC -- no less than 200, designed for 1,000 years
- 10 CFR 834 - proposed rule implementing DOE Order 5400.5

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Potential Waivers from ARARS

- Technetium-99 and cobalt-60 below MCL and declining, peak concentration reached groundwater many years ago - REQUIRED IF MTCA B IS ARAR
- Nitrate peak reached groundwater long ago and is declining - 200-BP-1 currently contributing additional 10-20 mg/L to upgradient concentrations that exceed MCL
- Cost of compliance at 200-BP-1 far exceeds benefit, given degree of contamination from all sources in the 200 Area

Potential Waivers from ARARS-Cont'd

- Added impacts from this operable unit can most effectively be addressed in 200 East Aggregate Area remediation, if needed
- Uranium will not reach groundwater in excess of proposed MCL for hundreds of years under current conditions, to thousands of years depending on remedy selected

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Long-Term Effectiveness and Permanence

- **Barrier Alternatives**
  - Assumptions regarding reliability of various designs
  - Vadose zone modeling results
- **Excavation and In-situ Fixation alternatives**
  - Vadose zone modeling results

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Total Uranium Concentration in Groundwater - 1cm/yr Infiltration

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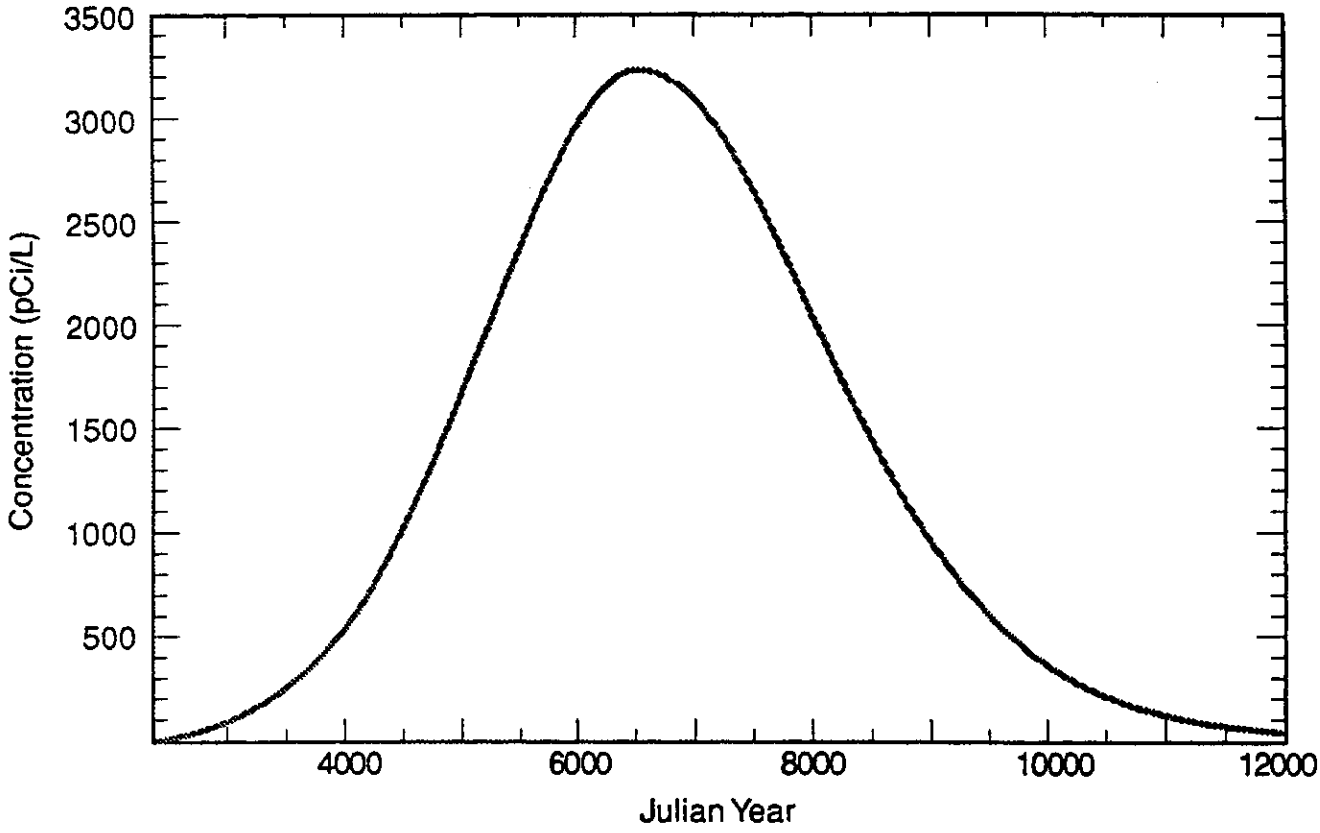

Total Uranium Concentration in Groundwater - 10cm/yr Infiltration

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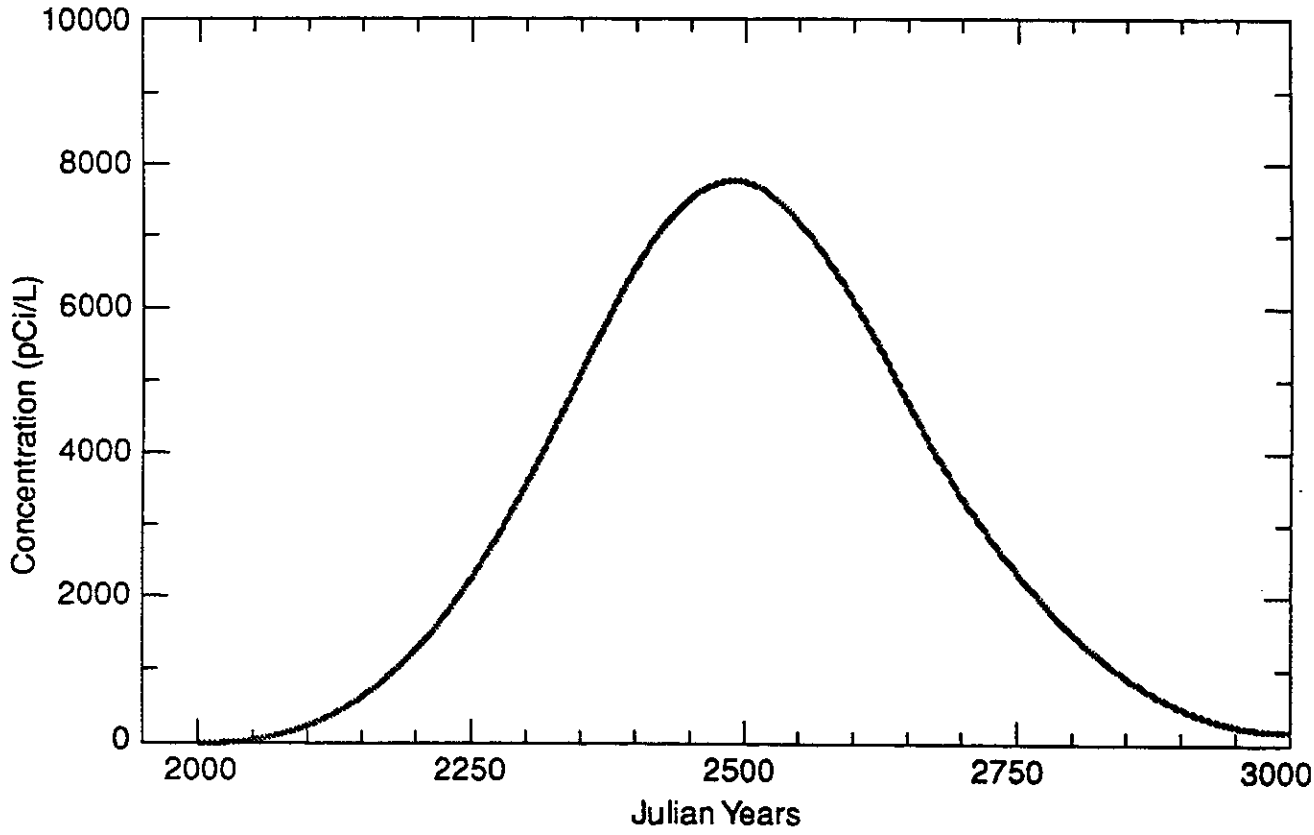

Total Uranium Concentration in Groundwater - 0.1cm/yr Infiltration

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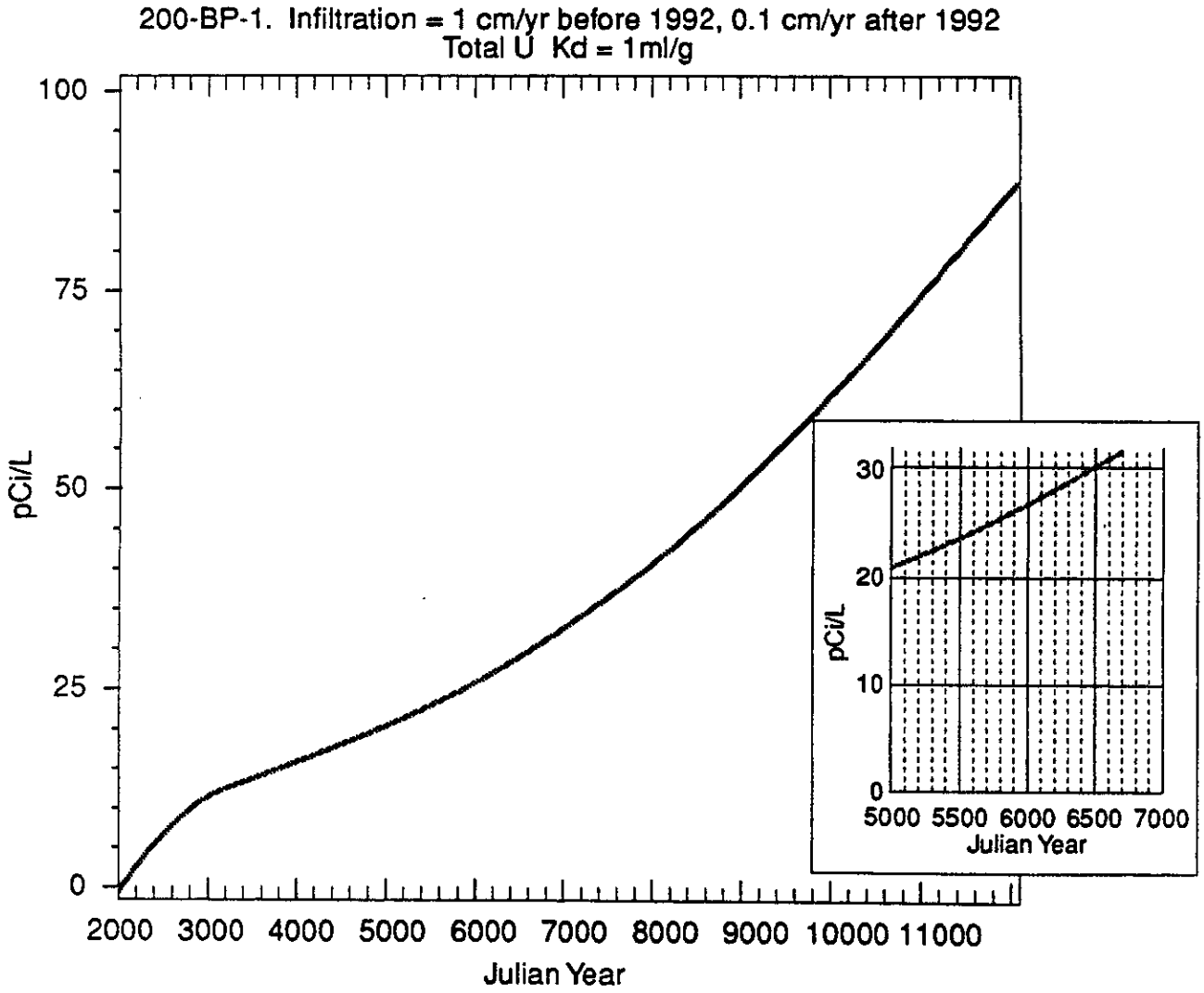

Total Uranium Concentration in Groundwater - 0.01cm/yr Infiltration

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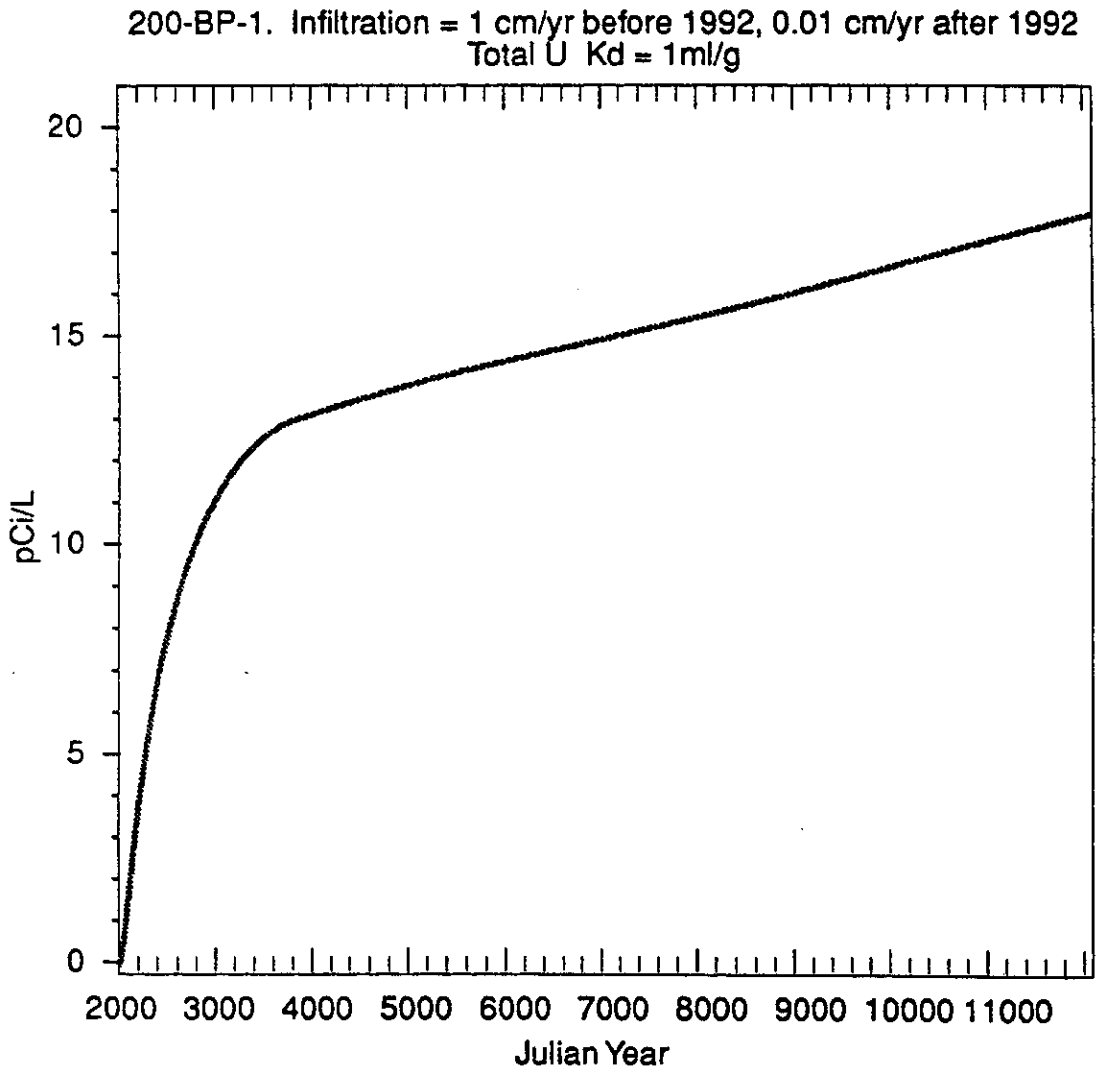

Total Uranium Concentration in Groundwater - 50-Foot-Deep Excavation

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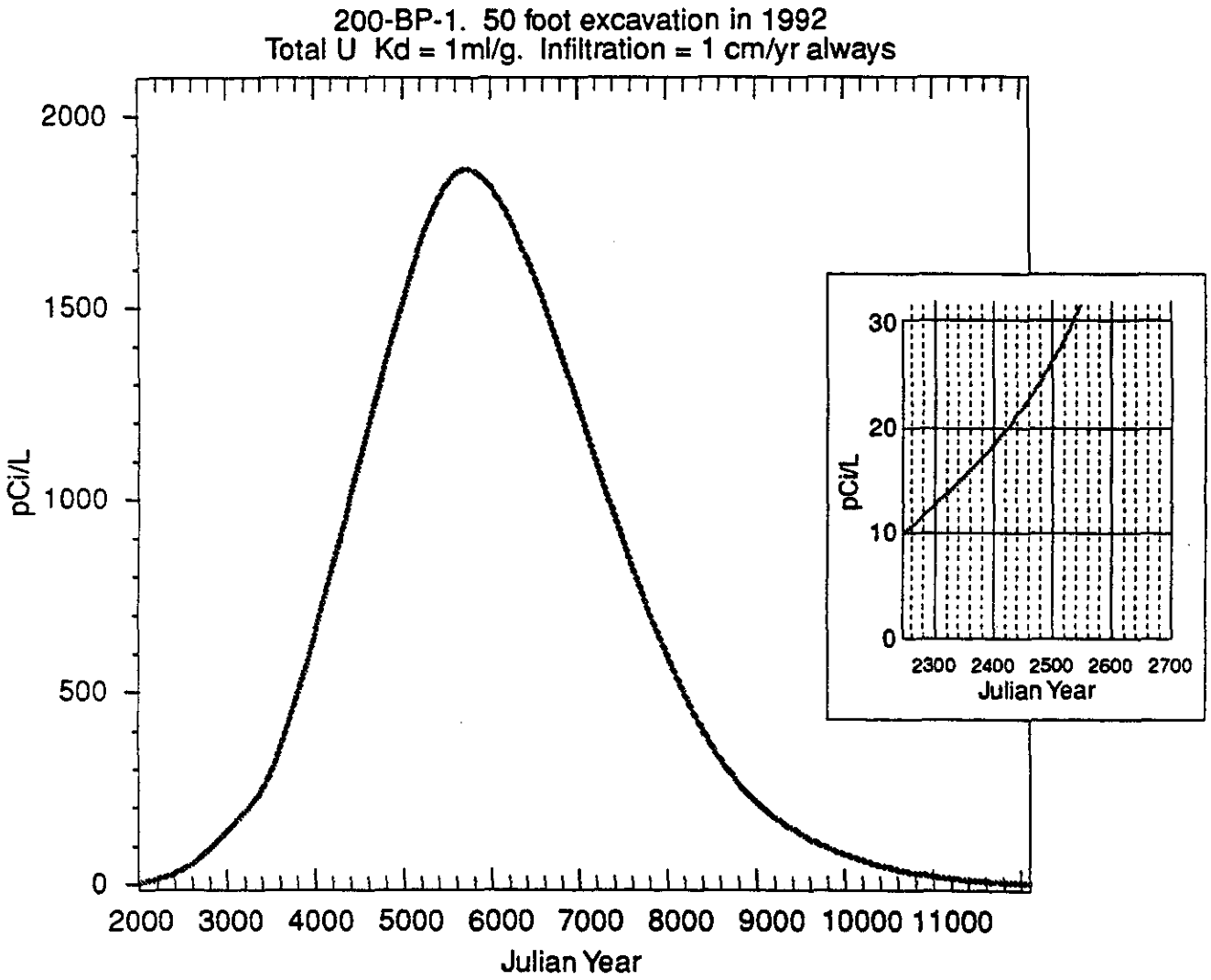

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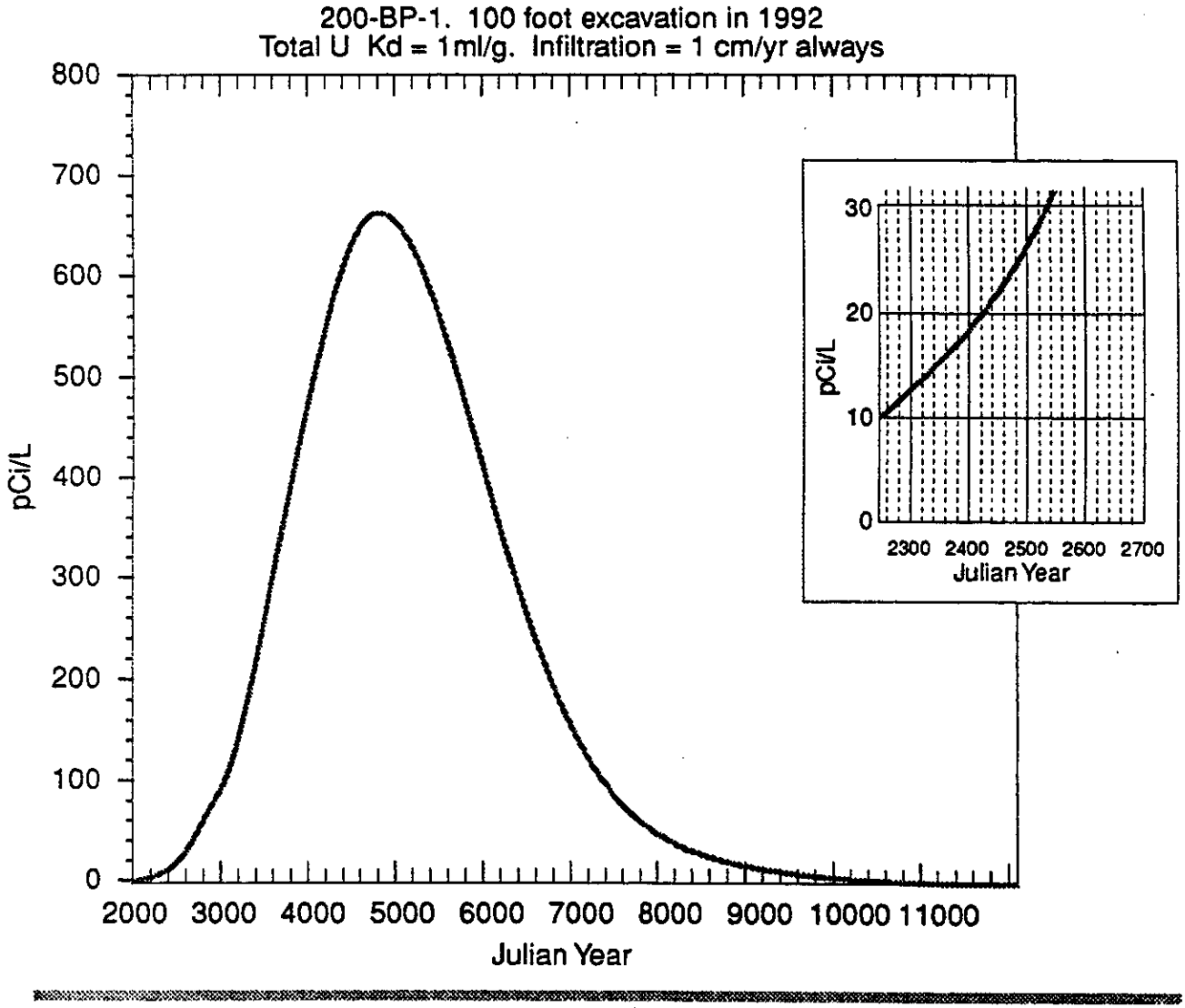
Total Uranium Concentration in Groundwater - 100-Foot-Deep Excavation



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Total Uranium Concentration in Groundwater - 150-Foot-Deep Excavation

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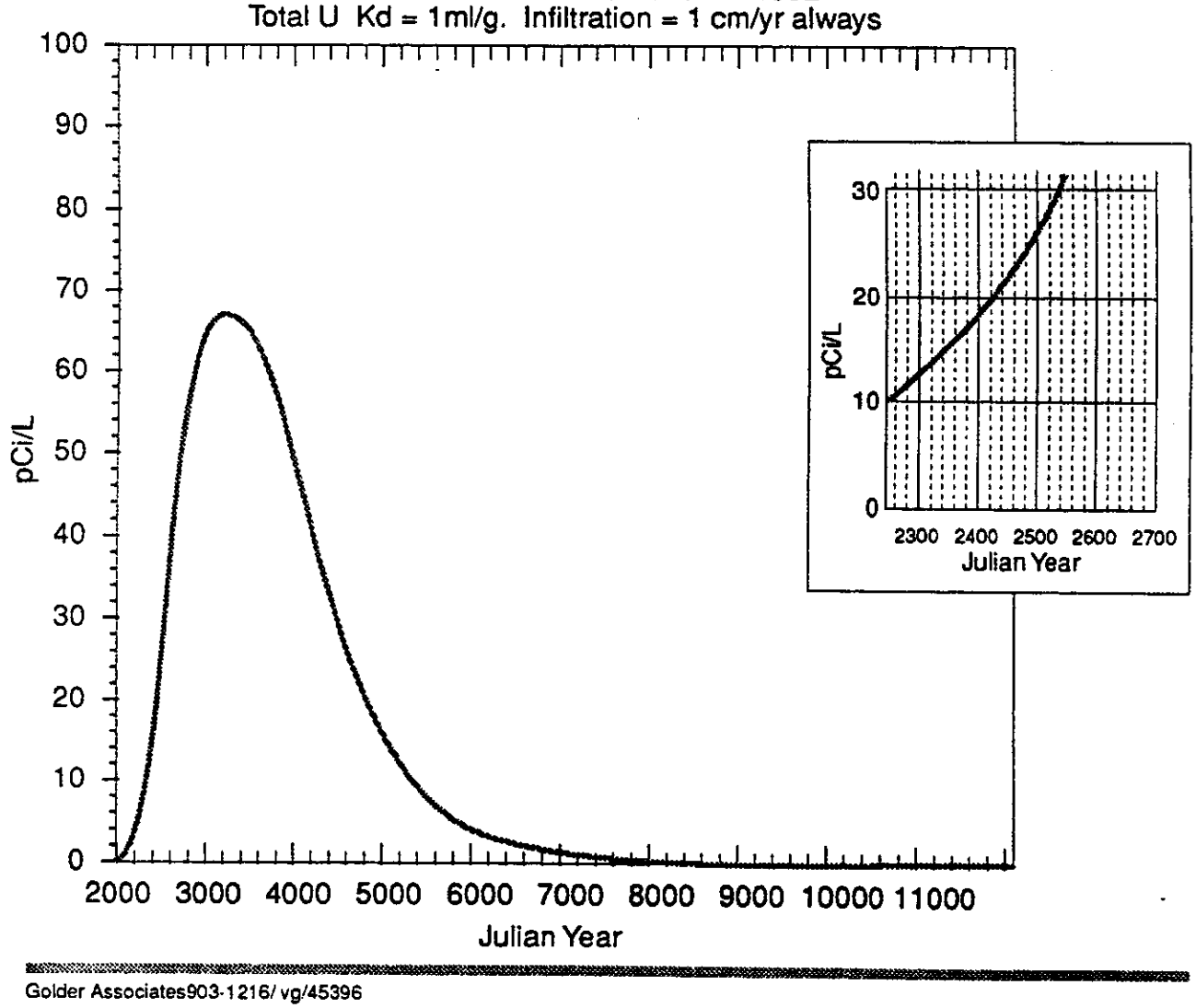

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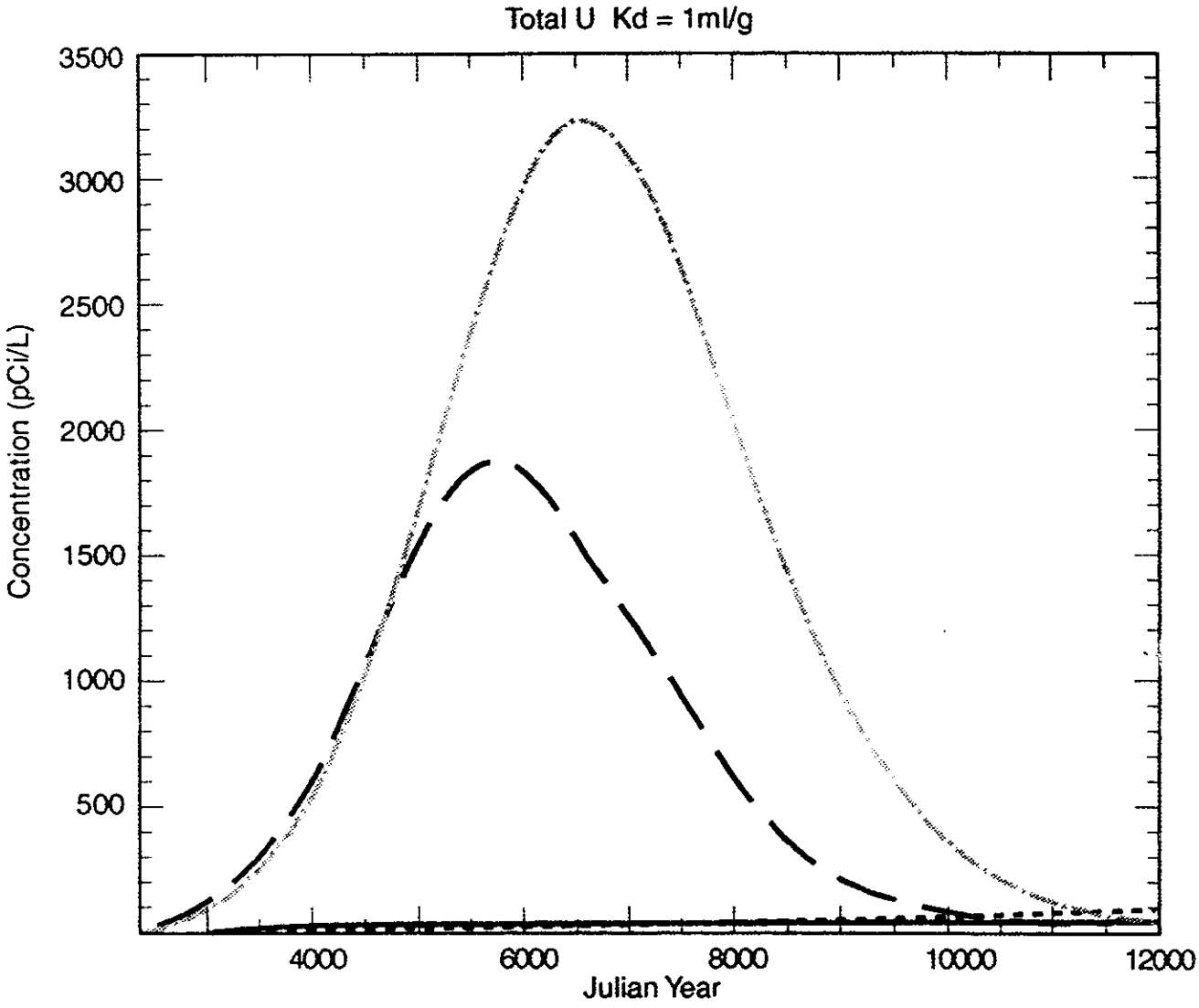
Total Uranium Concentrations in Groundwater



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Comparative Analysis of Alternatives

- **Comparison against the NCP criteria**
  - Threshold criteria
  - Modifying criteria
  - Balancing criteria

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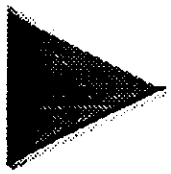

Methodology for Comparative Analysis

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- Assign relative scores for each alternative against modifying criteria
- Develop normalized criteria scores using a value function to translate the relative scores to a preference rating
- Normalized scores are on a scale of 0 to 10 with 0 being least preferred and 10 being most preferred
- Weight the criteria in terms of importance to the decision makers

Methodology for Comparative Analysis-Cont'd

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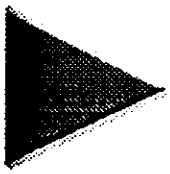
- Calculate the composite scores for each alternative using multi-variate computer program - HIPRE3+
- Determine the sensitivity of the scores to the criteria weighting



Long-Term Effectiveness and Permanence

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- **Objectives**
  - Reduce potential for intrusion and exposure of contaminated soil
  - Minimize infiltration and future groundwater contamination
- **Scoring alternatives to meet objectives**
  - Presence of a barrier and differences in long-term reliability
  - Reliability in treatment methods to reduce volume and/or mobility
  - Removal and disposal to ERSDF, which may have better containment and institutional controls

Alternative Scores for Long-Term Effectiveness and Permanence.

Alternative	Score	Rational
A) No Action	0	This alternative has the lowest effectiveness.
C) Biointrusion Barrier	4	Institutional Controls are a significant improvement over no-action, but the bio Barrier increases infiltration.
B) Institutional Controls	5	Institutional Controls are a significant improvement over no-action.
D) Modified RCRA Barrier	7	The RCRA Barrier reduced infiltration compared to existing surface materials.
E) Hanford Barrier	8	The Hanford Barrier is much thicker and more reliable than the RCRA Barrier.
I) Excavation and Disposal with RCRA Barrier	8	The contaminated soils are placed in the ERSDF with a Hanford Barrier. The slight advantage gained by placement of the most contaminated soils in the ERSDF (when compared with the Hanford Barrier alternative) is countered by the use of a RCRA Barrier over the remaining soils.
F) Excavation and Soil Washing with RCRA Barrier	8	Same rational as Alternative I. Soil washing does not significantly improve reliability.
J) In-Situ Fixation with RCRA Barrier	9	Fixation is worth more than the Hanford Barrier because it provides a different type of protection in case the Barrier fails.
H) Excavation and Ex-situ Fixation with RCRA Barrier	9	Same rational as Alternative J. Ex-situ fixation is not significantly more reliable than in-situ fixation.
G) Excavation, Soil Washing, and Vitrification with RCRA Barrier	10	Vitrification is more effective than fixation and the most contaminated soils are placed in the ERSDF with a Hanford Barrier.

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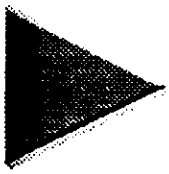

Short-Term Effectiveness

- **Off-site Community impacts are negligible**
- **Environmental impacts are negligible**
- **Worker risk during implementation**
  - Physical hazards only for barrier alternatives
  - Physical hazards and radiation exposure for excavation and in-situ fixation alternatives

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Alternative Scores for Short-Term Effectiveness.

Alternative	Radiation Exposure (rems)	Accident Rate (fatalities)
A) No Action	0	0
B) Institutional Controls	0	0
C) Biointrusion Barrier	0	0.002
D) Modified RCRA Barrier	0	0.004
E) Hanford Barrier	0	0.007
F) Excavation and Soil Washing with RCRA Barrier	675	0.021
G) Excavation, Soil Washing, and Vitrification with RCRA Barrier	770	0.031
H) Excavation and Ex-situ Fixation with RCRA Barrier	675	0.02
I) Excavation and Disposal with RCRA Barrier	500	0.01
J) In-Situ Fixation with RCRA Barrier	150	0.006

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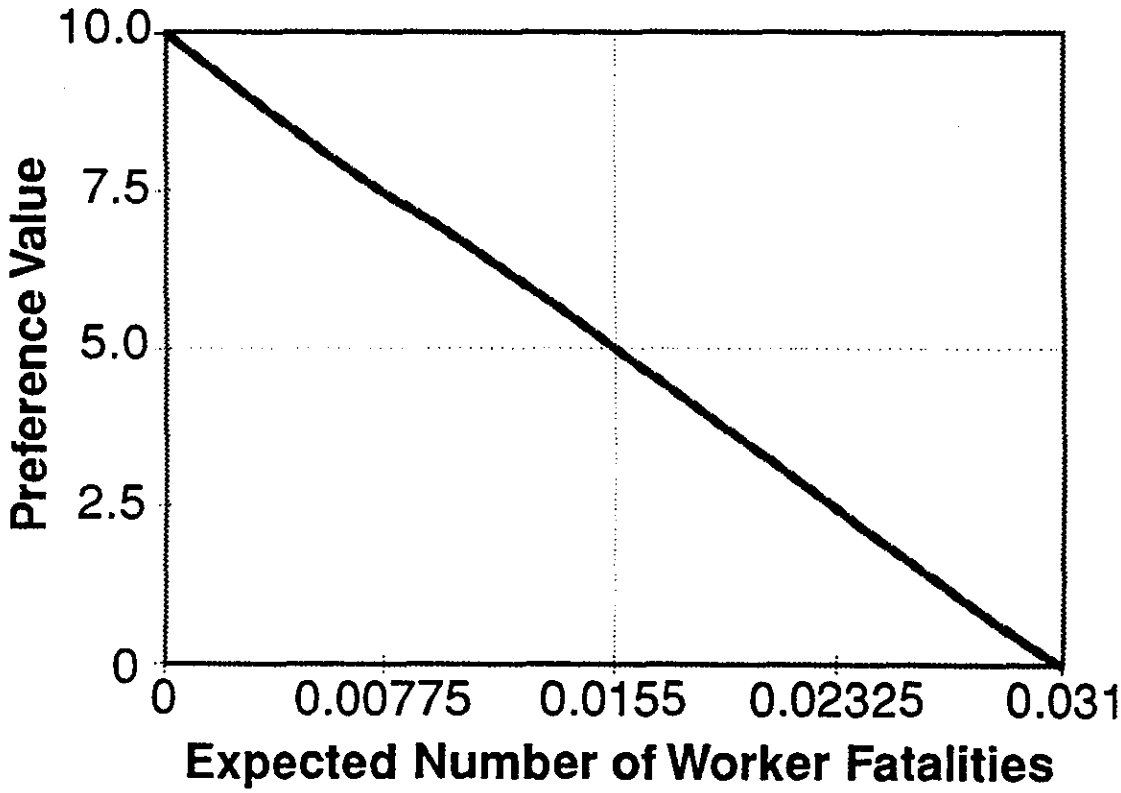
Value function for expected number of worker fatalities from accidents



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Value function for total worker radiation exposure

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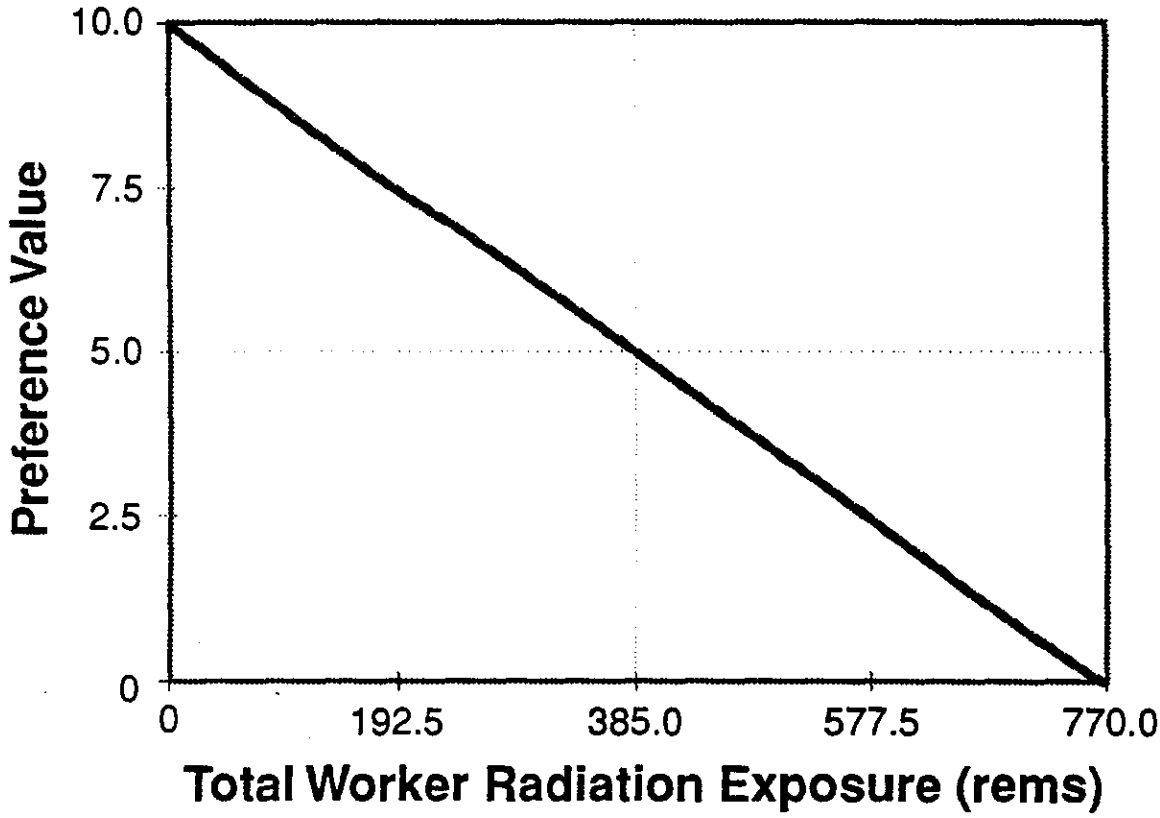

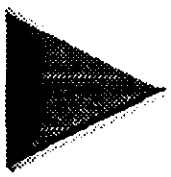

Implementability

- Complexity of the alternative - facilities, equipment and scheduling
- Necessity of excavation shoring adjacent to single-shell tanks
- Amount of landfill space required
- Potential for technical problems associated with untested technology

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Alternative Scores for Implementability.

Alternative	Score	Rational
A) No Action	10	No implementability difficulties.
B) Institutional Controls	10	Insignificant implementability issues associated with implementation of Institutional Controls.
C) Biointrusion Barrier	9	Very minor implementability issues associated with cap construction.
D) Modified RCRA Barrier	9	Very minor implementability issues associated with cap construction.
E) Hanford Barrier	9	Very minor implementability issues associated with cap construction.
J) In-Situ Fixation with RCRA Barrier	7	Soil mixing is a more complex and less developed technology then cap construction. Includes potential for worker exposure, but much less significant than excavation alternatives.
I) Excavation and Disposal with RCRA Barrier	2	Requires shoring for nearby tank farms. Excavation is much more complex operation than cap construction. Significant potential for worker exposure.
H) Excavation and Ex-situ Fixation with RCRA Barrier	1	Requires shoring for nearby tank farms. Excavation is much more complex operation than cap construction. Fixation plant involves additional complexities. Significant potential for worker exposure.
F) Excavation and Soil Washing with RCRA Barrier	1	Requires shoring for nearby tank farms. Excavation is much more complex operation than cap construction. Soil washing plant is similar in complexity to fixation plant. Significant potential for worker exposure.
G) Excavation, Soil Washing, and Vitrification with RCRA Barrier	0	Requires shoring for nearby tank farms. Much more complex operation than cap construction. Includes two treatment facilities along with associated complexity. Significant potential for worker exposure.

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Alternative Scores for Treatment.

Alternative	Score	Rational
A) No Action	0	No treatment.
B) Institutional Controls	0	No treatment.
C) Biointrusion Barrier	0	No treatment.
D) Modified RCRA Barrier	0	No treatment.
E) Hanford Barrier	0	No treatment.
I) Excavation and Disposal with RCRA Barrier	0	No treatment.
F) Excavation and Soil Washing with RCRA Barrier	5	Soil washing results in reduction of volume.
J) In-Situ Fixation with RCRA Barrier	5	Fixation reduces mobility.
H) Excavation and Ex-situ Fixation with RCRA Barrier	7	Ex-situ fixation is more effective than in-situ fixation and soil washing.
G) Excavation, Soil Washing, and Vitrification with RCRA Barrier	10	Soil washing reduces volume and vitrification reduces mobility. Vitrification is more effective than fixation.

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Alternative Cost.

Alternative	Cost (millions)
A) No Action	$1.1
B) Institutional Controls	$1.2
C) Biointrusion Barrier	~~$3.5~~ 3.5
D) Modified RCRA Barrier	~~$5.2~~ 5.7
E) Hanford Barrier	~~$7.6~~ 8.5
F) Excavation and Soil Washing with RCRA Barrier	~~$147~~ 182
G) Excavation, Soil Washing, and Vitrification with RCRA Barrier	~~$255~~ 268
H) Excavation and Ex-situ Fixation with RCRA Barrier	~~$82~~ 81
I) Excavation and Disposal with RCRA Barrier	~~$53~~ 82
J) In-Situ Fixation with RCRA Barrier	$54

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Value function for cost

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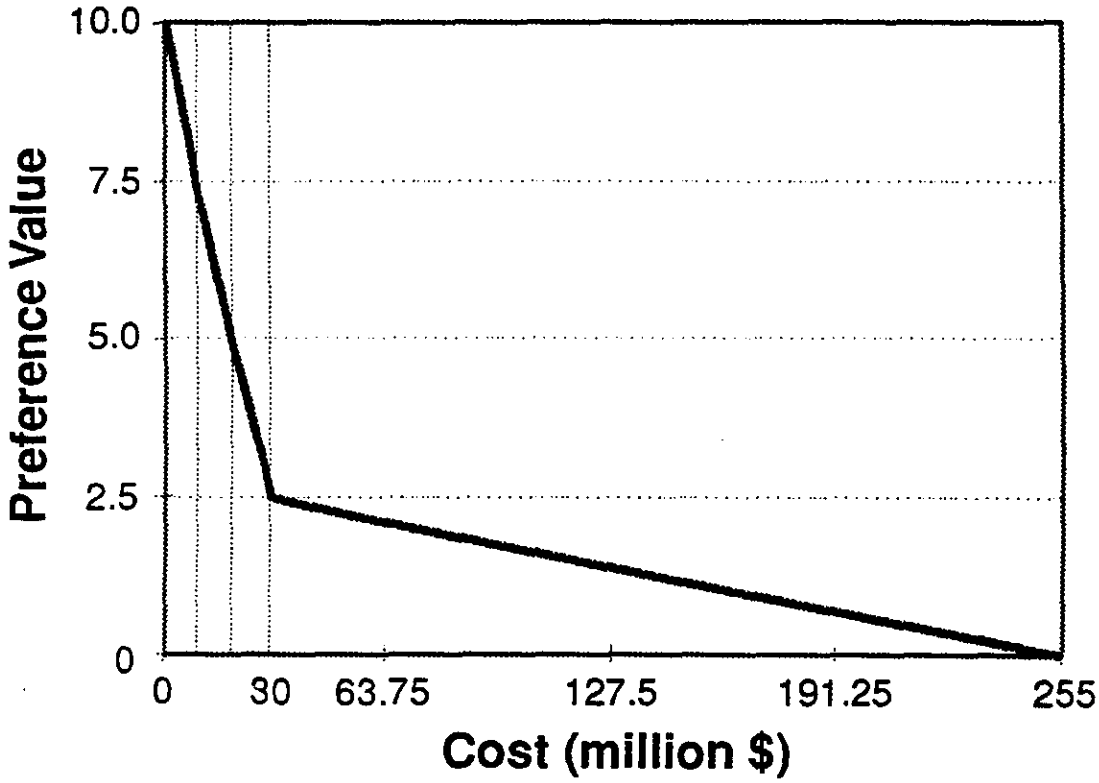

Hypothetical Criteria Weights, Normalized Preference Scores, and Composite Scores for Each of the Alternatives.

Alternative	Long-Term	Treatment	Short-Term		Implementability	Cost	Composite Score
			Radiation	Accidents			
(Criteria Weight)	(0.4)	(0.04)	(0.05)	(0.05)	(0.06)	(0.4)	
A) No Action	0	0	10	10	10	9.73	5.49
B) Institutional Controls	5	0	10	10	10	9.70	7.48
C) Biointrusion Barrier	4	0	10	9.35	9	9.17	6.78
D) Modified RCRA Barrier	7	0	10	8.71	9	8.70	7.76
E) Hanford Barrier	8	0	10	7.74	9	8.10	7.87
F) Excavation and Soil Washing with RCRA Barrier	8	5	1.23	3.23	1	1.20	4.16
G) Excavation, Soil Washing, and Vitrification with RCRA Barrier	10	10	0	0	0	0	4.40
H) Excavation and Ex-situ Fixation with RCRA Barrier	9	5	1.23	3.55	1	1.92	4.87
I) Excavation and Disposal with RCRA Barrier	8	0	3.51	6.77	2	2.24	4.73
J) In-Situ Fixation with RCRA Barrier	8	5	8.05	8.06	7	2.23	5.92

Composite Scores for Alternatives

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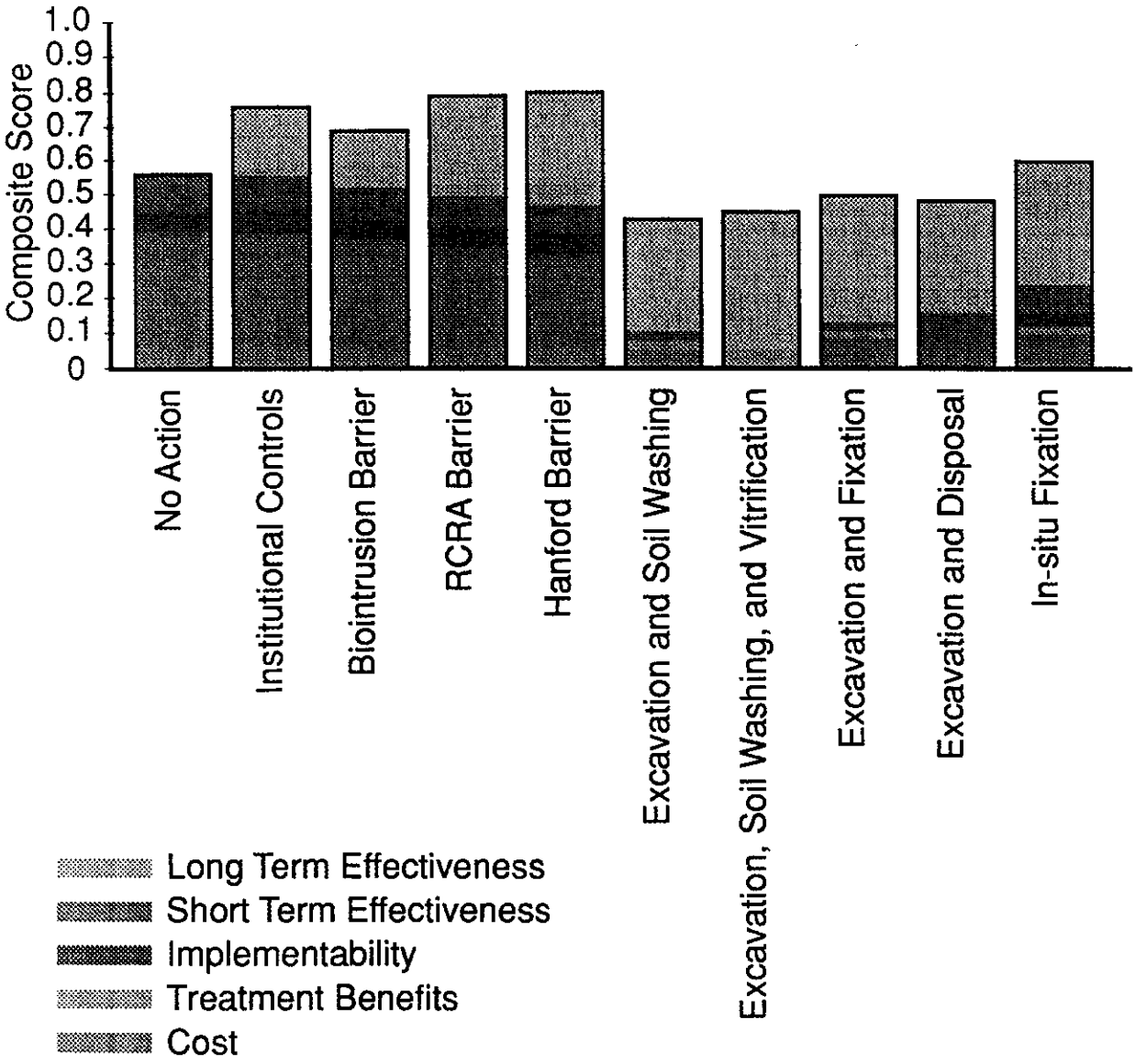
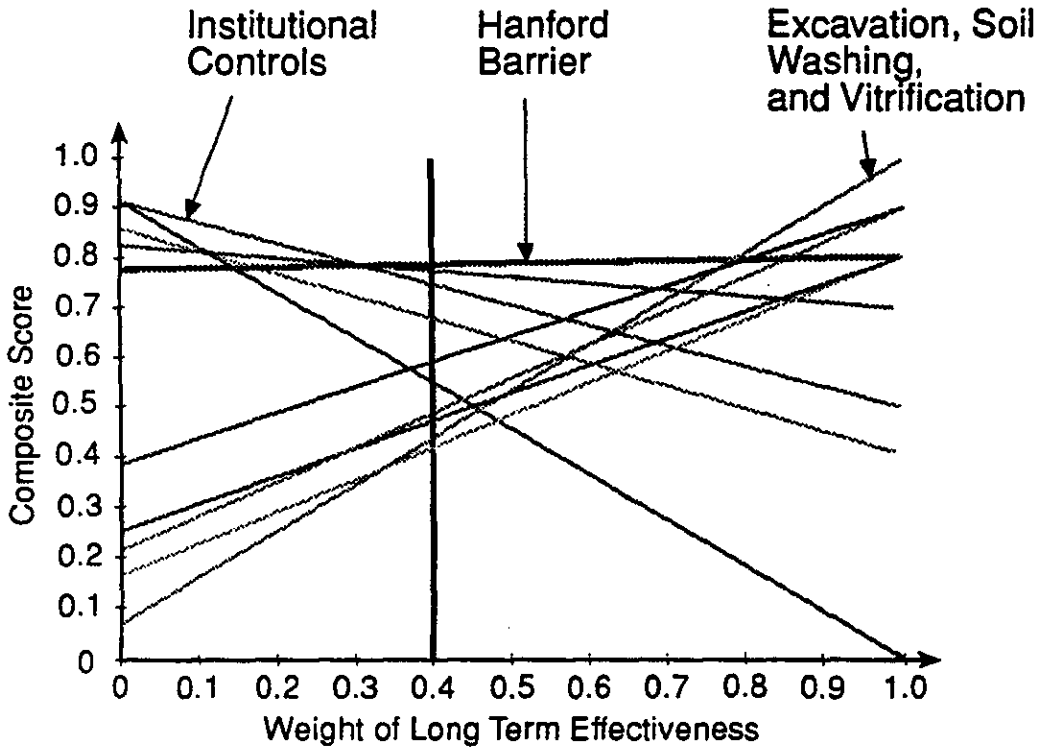


Sensitivity of Composite Scores to Weighting of Long Term Effectiveness



- No Action
- Institutional Controls
- Biointrusion Barrier
- RCRA Barrier
- Hanford Barrier
- Excavation and Soil Washing
- Excavation, Soil Washing, and Vitrification
- Excavation and Fixation
- Excavation and Disposal
- Insitu Fixation

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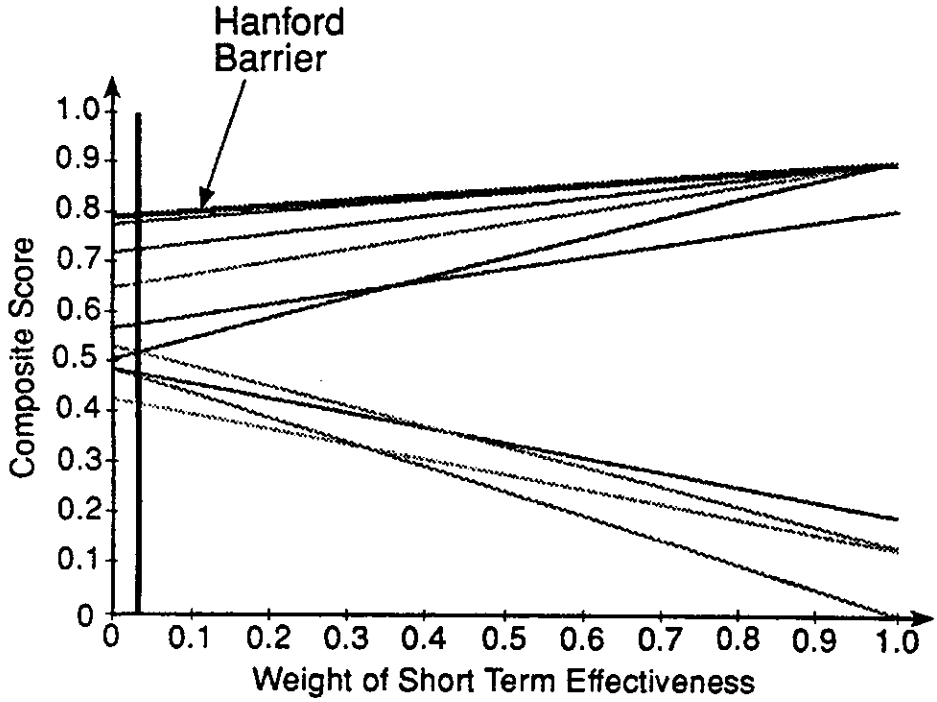
9313025.0961

Sensitivity of Composite Scores to Weighting of Short Term Effectiveness



- No Action
- Institutional Controls
- Biointrusion Barrier
- RCRA Barrier
- Hanford Barrier
- Excavation and Soil Washing
- Excavation, Soil Washing, and Vitrification
- Excavation and Fixation
- Excavation and Disposal
- Insitu Fixation

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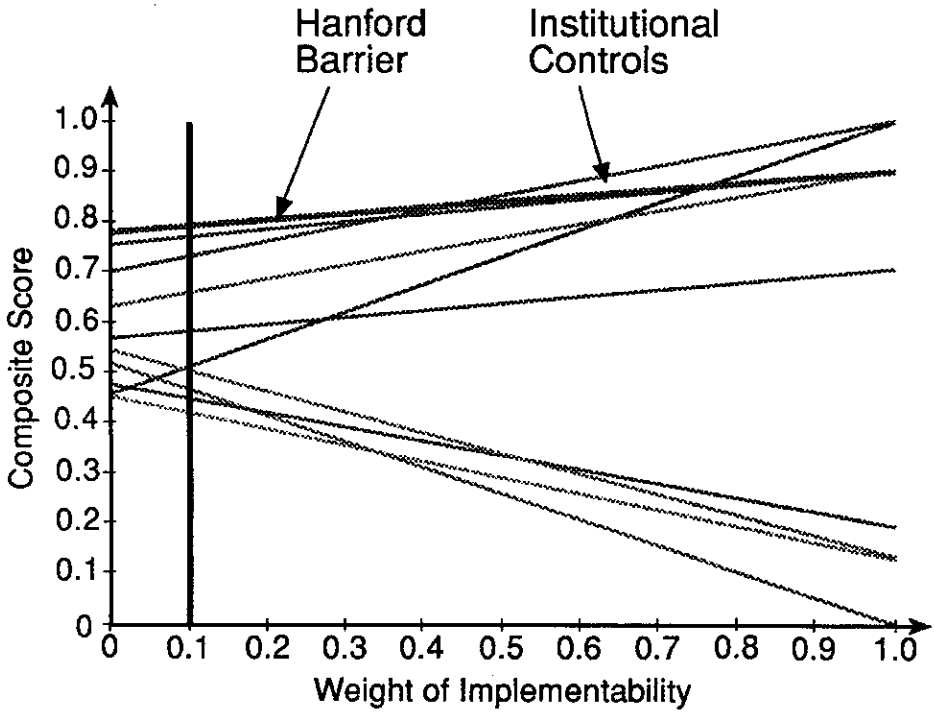
Sensitivity of Composite Scores to Weighting of Implementability



- No Action
- Institutional Controls
- Biointrusion Barrier
- RCRA Barrier
- Hanford Barrier
- Excavation and Soil Washing
- Excavation, Soil Washing, and Vitrification
- Excavation and Fixation
- Excavation and Disposal
- Insitu Fixation

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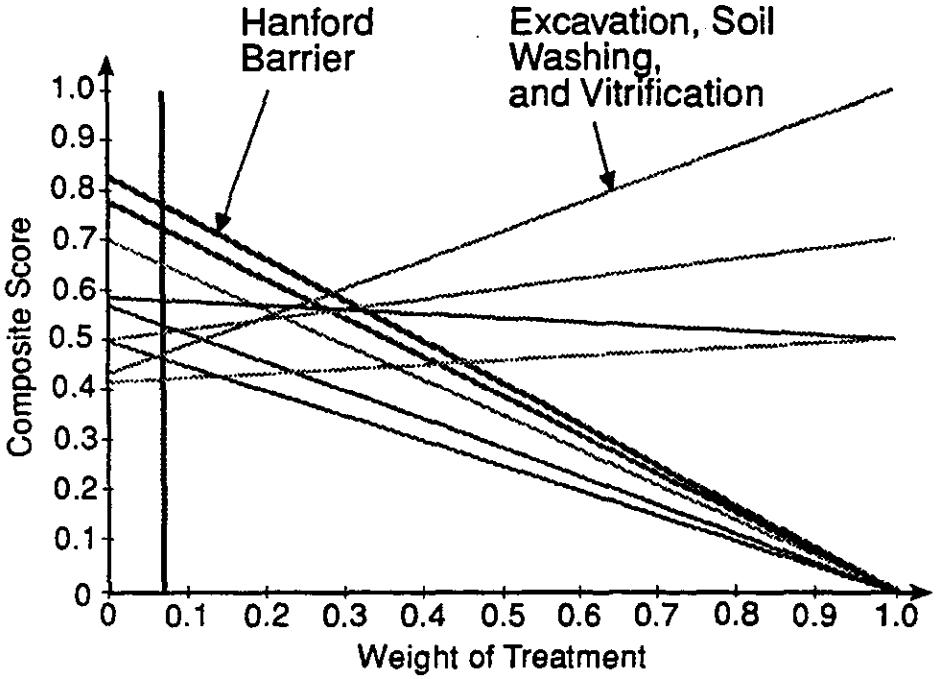
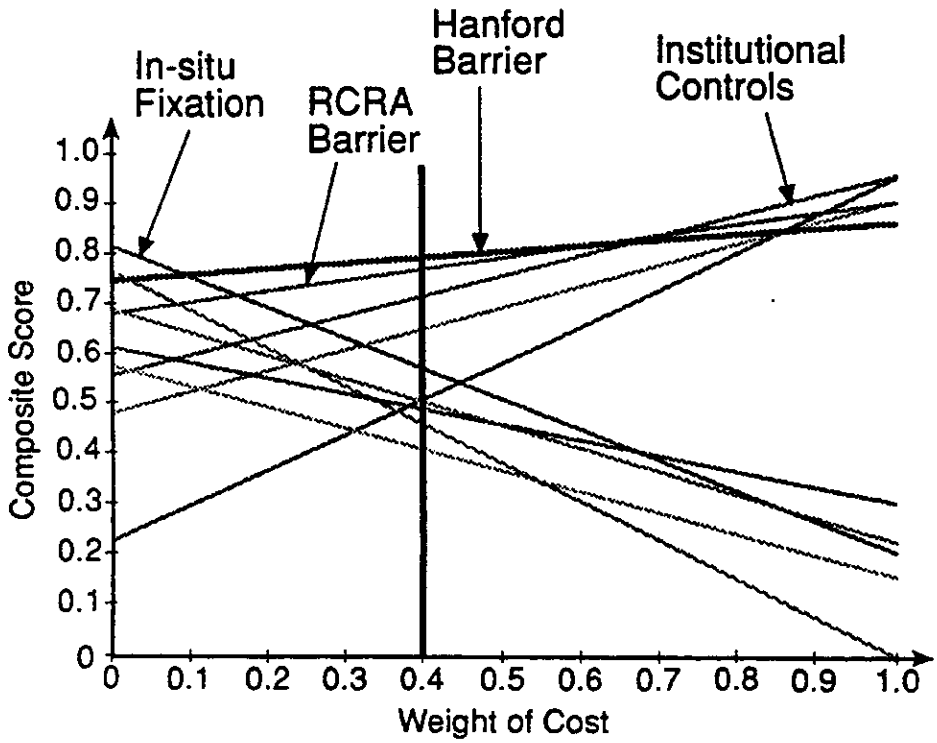
Sensitivity of Composite Scores to Weighting of Treatment



- No Action
- Institutional Controls
- Biointrusion Barrier
- RCRA Barrier
- Hanford Barrier
- Excavation and Soil Washing
- Excavation, Soil Washing, and Vitrification
- Excavation and Fixation
- Excavation and Disposal
- Insitu Fixation

Sensitivity of Composite Scores to Weighting of Cost



- No Action
- Institutional Controls
- Biointrusion Barrier
- RCRA Barrier
- Hanford Barrier
- Excavation and Soil Washing
- Excavation, Soil Washing, and Vitrification
- Excavation and Fixation
- Excavation and Disposal
- Insitu Fixation

Summary and Conclusions

- Current risk $<10^{-6}$
- Remedial action needed for long-term protection
- 200-BP-1 is similar to many other sites in 200 Area - ROD will establish precedence
- Selection of a remedy must take into account adjacent single-shell tanks
- Institutional controls alone are adequate until remedial actions at single-shell tanks determined and/or completed

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Distribution

Unit Manager's Meeting: 200-BP-1 Operable Unit
June 24, 1993

~~Roger D. Froeberg~~ /Julie K. Erickson /Paul M. Pak . . . . . DOE-RL, ERD (A5-19)
Mike Thompson . . . . . DOE-RL, EAP/RPB (A5-19)
Diane Clark . . . . . DOE-RL, TSD/SSB (A5-55)
Mary Harmon . . . . . DOE-HQ (EM-442)

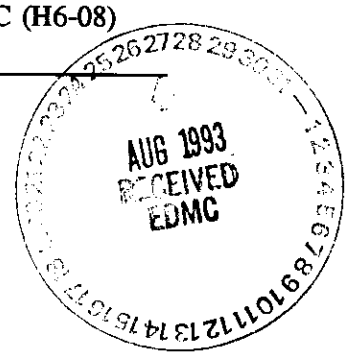
Paul Beaver . . . . . 200-BP-1 Operable Unit Manager, EPA (B5-01)
Ward Staubitz, USGS . . . . . Support to EPA
Audree DeAngeles, PRC . . . . . Support to EPA

Nancy Uziemblo . . . . . 200-BP-1 Operable Unit Manager, WDOE (Kennewick)
Larry Goldstein . . . . . WDOE (Lacey)

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

Tom Wintczak . . . . . Program Manager, WHC (H6-27)
Mel Adams /Rich Carlson, WHC (H6-03) . . . . . WHC (H6-01)
L.D. Arnold . . . . . WHC (B2-35)
Mark Buckmaster . . . . . WHC (H6-03)
Diana Sickle . . . . . WHC (H6-27)
200-BP-1 RI Project File . . . . . (H6-08)
Doug Dunster . . . . . Golder Associates, Support to WHC
Chris Widrig (Please route to:) . . . . . PNL (K1-21)
Wayne Martin . . . . . PNL (K1-19)
Mark Hanson . . . . . PNL (K1-51)
Roy Gephart . . . . . PNL (K1-22)
Steve Slate . . . . . PNL (K1-19)
Joan Keller . . . . . PNL (K1-21)
Ben Johnson . . . . . PNL (K1-78)
Ralph O. Patt . . . . . Oregon Water Resources Department

Original Sent To: ADMINISTRATIVE RECORD: 200-BP-1; Care of EDMC, WHC (H6-08)



This list has been updated. Please inform Suzanne E. Clarke (376-8189) or Kay Kimmel (376-1985) of Dames & Moore (A4-35) of deletions or additions to the distribution list.

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