FINAL ACTION MEMORANDUM

REMOVAL ACTION FOR CONTAMINATED SOIL FROM THE FORMER HAZARDOUS WASTE MANAGEMENT FACILITY PERIMETER AREA

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ACRONYMS, ABBREVIATIONS, AND UNITS OF MEASURE

AOC	Area of Concern
ARAR	Applicable or Relevant and Appropriate Requirements
BGRR	Brookhaven Graphite Research Reactor
BNL	Brookhaven National Laboratory
BSA	Brookhaven Science Associates
CERCLA	*Comprehensive Environmental Response, Compensation and Liability Act*
CFR	Code of Federal Regulations
Cs	Cesium
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
HFBR	High Flux Beam Reactor
HWMF	Hazardous Waste Management Facility
IAG	Interagency Agreement
NCP	National Contingency Plan
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
ORISE	Oak Ridge Institute for Science and Education
OU	Operable Unit
PRAP	Proposed Remedial Action Plan
RDIP	Remedial Design Implementation Plan
ROD	Record of Decision
SAP	Sampling and Analysis Plan
SCDHS	Suffolk County Department of Health Services
WLA	Waste Loading Area

I. PURPOSE

The purpose of this Action Memorandum is to document the decision by the U.S. Department of Energy (DOE) to complete the removal of radiologically contaminated soil from the Former Hazardous Waste Management Facility (HWMF) Perimeter Area.

II. SITE CONDITIONS AND BACKGROUND

A. Site Description

BNL is owned by DOE and is located in the Town of Brookhaven, Suffolk County, New York, approximately 60 miles east of New York City (Figure 1). Established in 1947, Brookhaven National Laboratory (BNL) is now operated and managed for DOE's Office of Science by Brookhaven Science Associates (BSA). One of the 17 DOE national laboratories, BNL conducts research in the physical, biomedical, and environmental sciences, as well as in energy technologies and national security. The Laboratory also builds and operates major scientific facilities available to university, industry, and government researchers.

The Former HWMF is located in the southeastern portion of BNL and is comprised of approximately 12 acres. The Former HWMF was used during the period between 1947 and 1997 as the central receiving facility for storage, processing and limited treatment of waste generated at BNL. The remediation of the Former HWMF, Area of Concern (AOC) 1, was completed in 2005.

The Waste Loading Area (WLA), approximately two acres segregated from the original 12 acres of the Former HWMF, was used as a staging area for loading bulk waste into railcars from the Former HWMF, Building 811, and Brookhaven Graphite Research Reactor (BGRR) projects. The cleanup of the WLA was transferred to the High Flux Beam Reactor (HFBR) scope of work (AOC 31) through a modification to the Remedial Design Implementation Plan (RDIP) for the Former HWMF. The cleanup of the WLA was completed in 2008.

Radiological contamination was identified in surface soil in the perimeter area of the Former HWMF (near Brookhaven Avenue) in 2005 (Figure 1). The contamination is believed to be a result of historical operations associated with the transfer of wastes to the Former HWMF, spills, and historical runoff from contaminated soils within the facility.

The soil contamination areas are shown on Figure 2, and detected Cs-137 concentrations are summarized in Table 1.

Figure 1 -- Location of BNL and Perimeter Soils Area on BNL Property

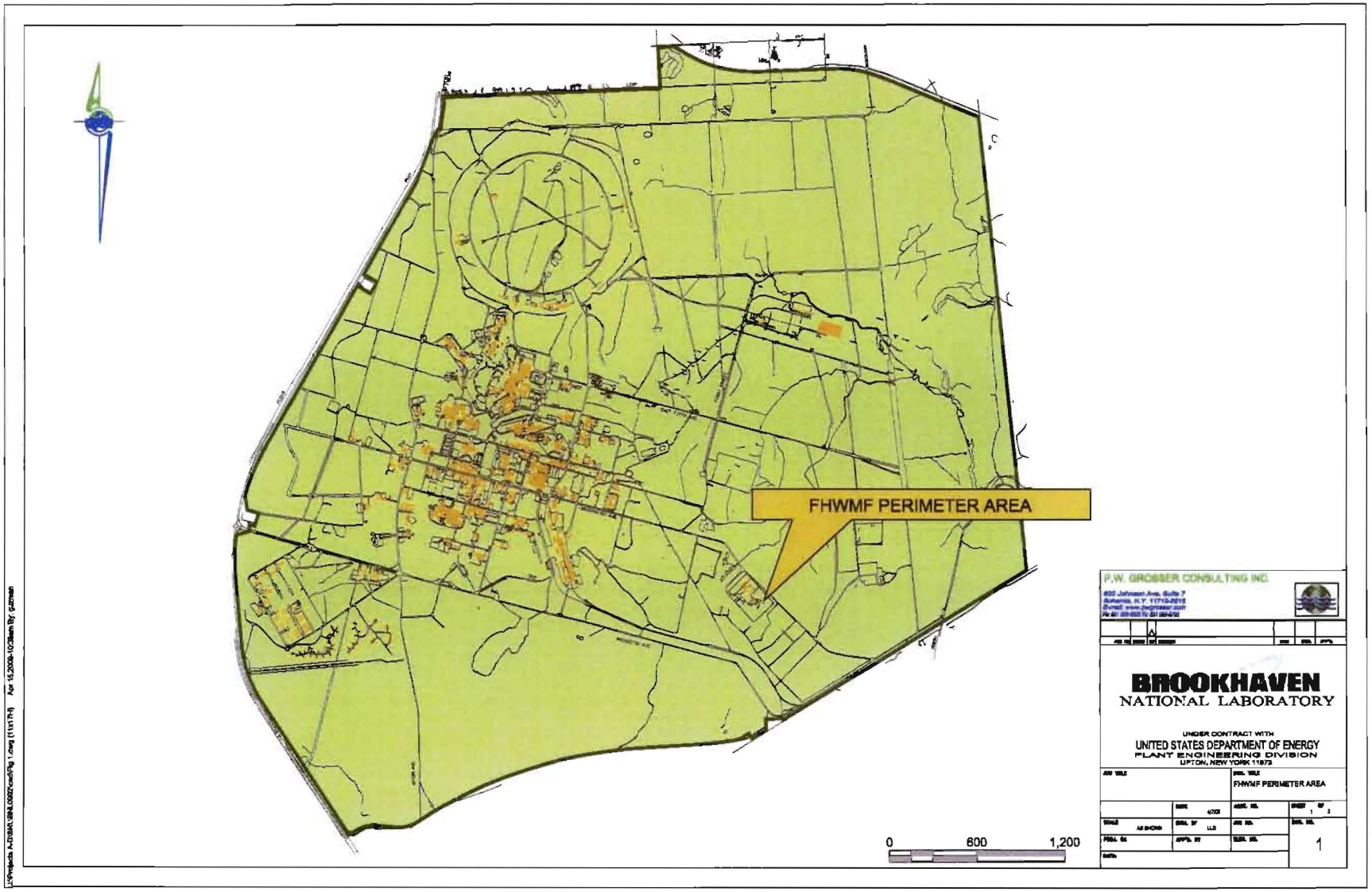

Figure 2 – Perimeter Soils Remediation Area

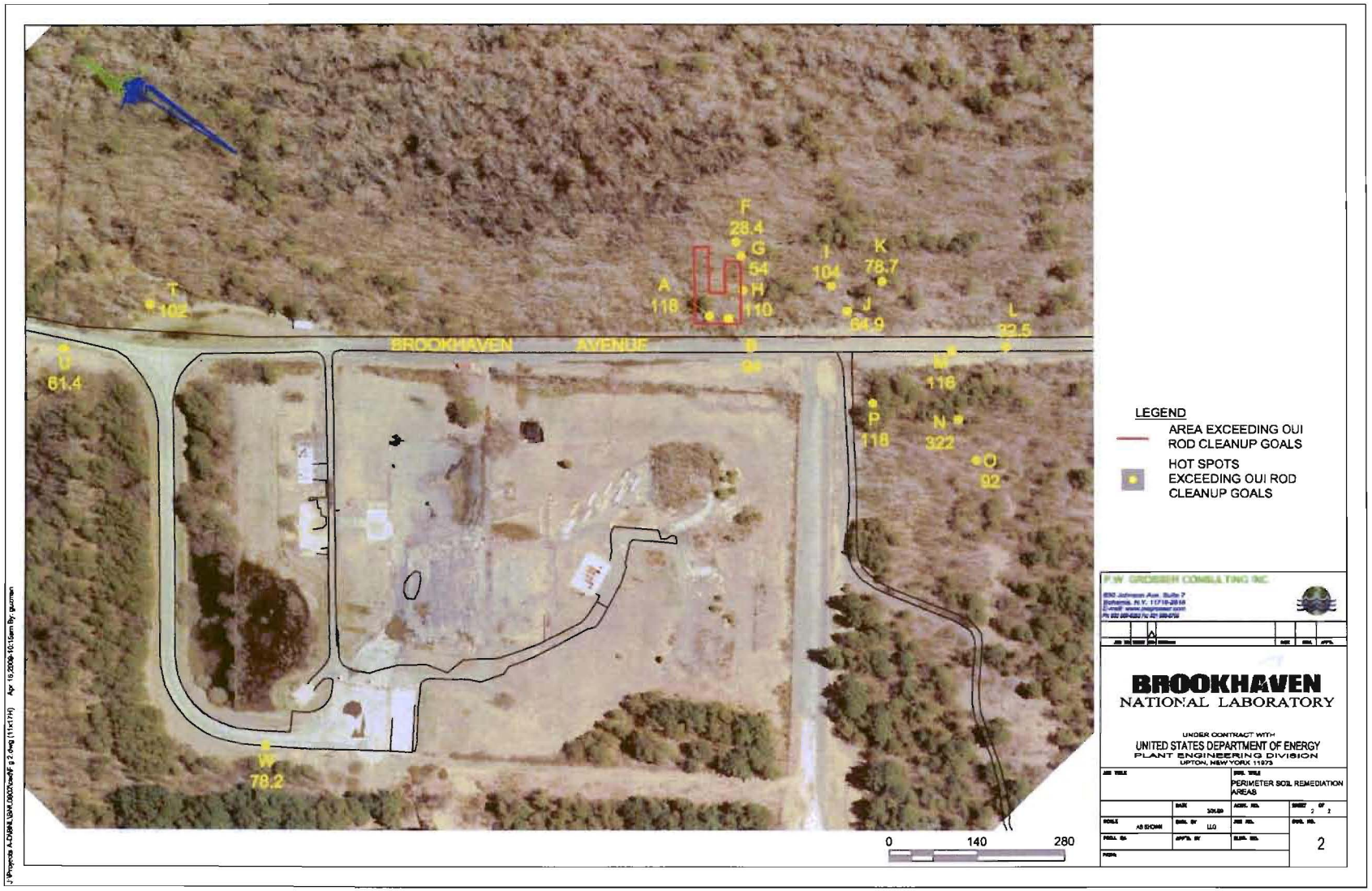

Table 1
Cesium-137 Concentrations Detected at the Former HWMF Perimeter Area

Area	Concentration (pCi/g)
Area A	118
Area B	94
Area F	28.4
Area G	54
Area H	110
Area I	104
Area J	64.9
Area K	78.7
Area L	32.5
Area M	116
Area N	322
Area O	92
Area P	118
Area T	102
Area U	61.4
Area W	78.2

B. Actions to Date

1. Previous Actions

Remediation of the Former HWMF and WLA was completed using the selected remedy in the Operable Unit (OU) 1 Record of Decision (ROD).

A Sampling and Analysis Plan (SAP) was prepared that describes the scope of the investigation to be conducted around the perimeter of the Former HWMF. The SAP was submitted to the U.S. Environmental Protection Agency (EPA), New York State Department of Environmental Conservation (NYSDEC), New York State Department of Health (NYSDOH), and Suffolk County Department of Health Services (SCDHS) in August 2006 for review.

A report detailing the results of the investigation and characterization of the Former HWMF Perimeter Area was completed and submitted to EPA, NYSDEC, NYSDOH, and SCDHS in December 2007.

Limited excavation of several areas with Cs-137 concentrations exceeding OU I ROD cleanup goals was performed between August and September 2008.

2. Current Actions

The remediation (by excavation and off-site disposal) of the contaminated soil in the perimeter area of the Former HWMF will be performed using the residential cleanup goals and methodology specified for radiologically contaminated soils in the OU I ROD. OU I Cleanup Goals for Residential Land Use are summarized in Table 2.

Table 2
Radionuclide Cleanup Goals from the OU I Record of Decision for Residential Land Use

Radionuclide	Concentration (pCi/g)
Cs-137	23
Sr-90	15
Ra-226	5

3. Planned Actions

A Completion Report will be prepared to document the removal action.

C. National Priorities List Status

Brookhaven National Laboratory was added to the National Priorities List in 1989.

III. THREATS TO PUBLIC HEALTH OR WELFARE AND THE ENVIRONMENT/ STATUTORY AND REGULATORY AUTHORITIES

This action is being undertaken as a removal action under the Interagency Agreement among the DOE, EPA, and NYSDEC. The appropriateness of the removal action is based on the following:

- Factors listed in 40 Code of Federal Regulations (CFR) 300.415 (b) (2) of the regulations implementing *Comprehensive Environmental Response, Compensation, and Liability Act* (CERCLA), including:
  - Actual or potential exposure to human populations, animals, or the food chain from hazardous substances or pollutants or contaminants; and
  - Weather conditions that may cause hazardous substances, pollutants, or contaminants to migrate and be released.

- Consistency with the final remedy selected for the OU I radiologically contaminated soils, to be addressed in this action, as described in the OU I ROD.

IV. IDENTIFICATION OF REMOVAL ACTION OBJECTIVES

The removal action objectives are the same as the following remedial objectives established in the OU I ROD:

- Minimize threats to human health and the environment from site contaminants;
- Prevent or minimize the leaching of contaminants from the soils into the underlying aquifer as a result of the infiltration of precipitation;
- Prevent or minimize the migration of contaminants present in surface soils via surface runoff and windblown dusts;
- Prevent or minimize human exposure including direct external exposure, ingestion, inhalation, and dermal contact (for future residents, trespassers, site workers, and construction workers) and environmental exposure to contaminants in the surface and subsurface soils; and
- Prevent or minimize the uptake of contaminants present in the soils by ecological receptors.

V. PROPOSED ACTION AND ESTIMATED COSTS

A. Proposed Action

This Action Memorandum addresses the excavation of radiologically contaminated soil adjacent to the Former HWMF using the dose-based cleanup goal and methodology specified for OU I radiologically contaminated soils in the OU I ROD.

Excavation will be conducted in general accordance with technical specifications and design criteria established for the Former HWMF Soils Removal Project.

The cleanup activities include:

- Detailed planning
- Remediation by excavation
- Final status survey
- Oak Ridge Institute for Science and Education (ORISE) verification survey
- Site restoration

- Waste transport and disposal

B. Contribution to the Remedial Performance

This removal action will contribute to the overall cleanup of contaminated soils at BNL. This action will be documented after completion in a Completion Report.

C. Description of Alternative Technologies

The remediation of the contaminated soil in the perimeter area of the Former HWMF will be performed using the same or similar excavation, staging, and shipping methods employed for the Former HWMF, the WLA, and the balance of the OU I radiologically contaminated soils. No alternative technologies are required for the implementation of this action.

D. Applicable or Relevant and Appropriate Requirements

The federal and state applicable or relevant and appropriate requirements (ARARs) pertinent to this action were identified in OU I ROD. The performance standards selected in the OU I ROD and to be utilized in this removal action were based on a risk assessment.

E. Project Schedule

The current working schedule calls for the removal action, beginning with detailed planning, to be initiated in May 2009 and completed by March 2010.

F. Estimated Cost

The cleanup will cost approximately $923,000.

VI. EXPECTED CHANGE IN THE SITUATION, SHOULD ACTION BE DELAYED OR NOT TAKEN

A delayed action or no action may increase the potential for migration of contaminants present in surface soils by surface runoff.

VII. PUBLIC PARTICIPATION

A. BNL Community Relations

The BNL Community Relations Plan was written in September 1991 and is supplemented by activity-specific plans. In accordance with these plans and CERCLA Sections 113 (k)(2)(B)(i-v) and 117, the Community Relations program focuses on

informing and involving the public. A variety of activities used to provide information and seek public participation include compiling a stakeholders mailing list; holding community meetings, availability sessions, site tours, and workshops; and preparing and distributing fact sheets. The Administrative Record, which documents the basis for removal and remedial actions, was established and is maintained at the libraries listed below:

Brookhaven National Laboratory
Research Library
Bldg. 477A
Upton, NY 11973
631-344-3483 or 631-344-3489

Stony Brook University
Melville Library
Special Collections and University Archives
Room E-2320
Stony Brook, NY 11794
Phone: (631) 632-7119

U.S. EPA - Region II
Records Room
290 Broadway, 18th Floor
New York, New York 10007
212-637-4308

B. Community Involvement

The community involvement activities conducted for the final remedy selection process for OU I (of which the Former HWMF and the WLA were part) included a formal public review of the OU I Proposed Remedial Action Plan (PRAP). The public comment period began April 1, 1999 and ended April 30, 1999. Information sessions and a public meeting were held during the public comment period. DOE's responses to public comments and concerns were included in the OU I ROD Responsiveness Summary.

The community involvement activities conducted for the remedy selection process for the HFBR (including the remediation of the WLA using the OU I cleanup goals and methodology) included a formal public review of the HFBR PRAP. The public comment period began January 10, 2009 and ended March 17, 2008. Two information sessions and a public meeting were held during the public comment period. Public comments received indicate that there is considerable community support for DOE's preferred remedial alternative identified in the PRAP (Alternative C, Phased Decontamination and Dismantlement with Near-Term CRB Removal). DOE's responses to public comments and concerns are included in the HFBR ROD Responsiveness Summary.

The removal of radiologically contaminated soil from the Former HWMF Perimeter Area will be performed using the cleanup goals and methodology established in the OU I ROD and used in the HFBR ROD.

VIII. OUTSTANDING POLICY ISSUES

There are no outstanding policy issues identified for this removal action.

IX. ENFORCEMENT

DOE owns BNL, and will fund this removal action. The removal action will be conducted in accordance with the *Comprehensive Environmental Response, Compensation and Liability Act* (CERCLA), National Contingency Plan (NCP) requirements, the Interagency Agreement (IAG), and applicable New York State regulations.

X. RECOMMENDATION

This Action Memorandum recommends a non-time-critical removal action for the removal of radiologically contaminated soil from the Former HWMF Perimeter Area. This decision document was developed in accordance with CERCLA, and is consistent with NCP and IAG.

XI. REFERENCES

BNL, 1999, *Record of Decision, Operable Unit I and Radiologically Contaminated Soils*, August 1999.

BNL, 2003, *Remedial Action Work Plan, Operable Unit I, Area of Concern I, Former Hazardous Waste Management Facility*, March 2003.

BNL, 2004, *Remedial Design Implementation Plan, Operable Unit I, Area of Concern 1, Former Hazardous Waste Management Facility Remedial Action Work Plan*, March 2004.

BNL, 2005, *Closeout Report, Former Hazardous Waste Management Facility Soil Remediation*, September 2005.

BNL, 2006. *Sampling and Analysis Plan for Investigation of Low-Level Cesium-137 Contamination near the Former hazardous Waste Management Facility and East of NEXRAD*, July 2006.

BNL, 2007a. *Investigation and Characterization of the Brookhaven Avenue Cs-137 Contamination*, November 2007.

BNL, 2007b. *Action Memorandum, High Flux Beam Reactor, Removal Action for Waste Loading Area*, October 26, 2007.

BNL, 2009, *Record of Decision, Area of Concern 31, High Flux Beam Reactor*, February 2009.

Letter, R. V. Rimando, Jr., DOE, to J. Lister, NYSDEC and D. Pocze, EPA, *Subject: Brookhaven National Laboratory Interagency Agreement, Remedial Design Implementation Plan (RDIP), Operable Unit I, Area of Concern (AOC) 1, Former Hazardous waste Management Facility (HWMF)*, September 30, 2005.

URS, 2000, *Remedial Design and General Supplemental Specifications for Remedial Action, Operable Unit I Contaminated Soil and Debris*, October 2000.