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Environmental Audit of the Maywood Site

**Formerly Utilized Sites Remedial Action Program
Maywood Interim Storage Site
Vicinity Properties**

**U.S. Department of Energy
Office of Environmental Audit
Washington, DC 20585**

December 1990

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PREFACE
U.S. DEPARTMENT OF ENERGY
ENVIRONMENTAL AUDIT
MAYWOOD INTERIM STORAGE SITE

On June 27, 1989, the Secretary of Energy announced a 10-point initiative to strengthen environmental protection within the U.S. Department of Energy (DOE). Consistent with this initiative, the Secretary emphasized and strengthened independent internal oversight as a management reform in Secretary of Energy Notice (SEN)-11-89, which would monitor the effectiveness of DOE management in complying with operational, environmental, safety, health, and security standards established by law, regulation, and DOE policy.

As part of the internal oversight responsibilities within DOE, the Office of Environment, Safety and Health (ES&H) has established a program within the Office of Environmental Audit, EH-24, to conduct multidisciplinary environmental audits at DOE's operating facilities. The initial audits in this program are designed to gather baseline information on environmental compliance and management at facilities that have not undergone a DOE Headquarters Environmental Survey or Tiger Team Assessment and are not expected to be scheduled for a Tiger Team Assessment through Fiscal Year 1992.

This document contains findings identified during the Environmental Audit of the Formerly Utilized Sites Remedial Action Program Maywood Site and its related vicinity properties. This Environmental Audit was conducted by the DOE's Office of Environmental Audit between November 7 and 16, 1990.

The objective of the Audit is to provide the Secretary with information on the compliance status of DOE facilities with regard to environmental requirements, root causes for noncompliance, and adequacy of DOE environmental management programs and response actions to address the identified problem areas.

The scope of this Environmental Audit was comprehensive, covering all areas of environmental activities and waste management operations, with the exception of the National Environmental Policy Act (NEPA), which is the responsibility of the DOE Headquarters Office of NEPA Project Assistance. Compliance with applicable Federal, state, and local regulations; applicable DOE Orders; and internal facility requirements was assessed, along with adherence to best management practices.

December 1990
Washington, D.C.

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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

This report presents the results of the Environmental Audit of the Maywood Site managed by the Formerly Utilized Sites Remedial Action Program (FUSRAP). The Audit was carried out from November 7 through 16, 1990.

FUSRAP manages investigations and remedial actions for facilities which are contaminated with radioactive and (in some cases) chemical wastes resulting from former activities of the U.S. Department of Energy (DOE) or its predecessor agencies, such as the Atomic Energy Commission or the Manhattan Engineer District of the U.S. Army Corps of Engineers, on sites contaminated by commercial operations that Congress has mandated DOE to remediate. This is the first Headquarters Environmental Audit of a FUSRAP site.

Strengths of the Formerly Utilized Sites Remedial Action Program (FUSRAP) include technical and regulatory knowledge and program management.

The Audit Team found overall technical competence and knowledge of management and staff to be excellent. This applies to DOE as well as to Bechtel National, Incorporated (BNI). In particular, there was excellent knowledge of Federal, state, and local environmental regulations, as well as analysis for applicability of these regulations to FUSRAP.

Project management of the Maywood Site is also excellent. BNI and DOE project staff have made frequent contact with members of the community, and all removal actions and remedial investigation activities have been planned, scheduled, and accomplished with competence and attention to total quality principles. To date, all actions taken for the Maywood Site cleanup have been completed ahead of schedule and on or under budget.

Weaknesses noted include self-assessment efforts by DOE, failure to fully implement DOE Order requirements throughout the program, and some discrepancies in formally documenting and reviewing procedures.

The most important weakness found was a failure to recognize or acknowledge the applicability of some DOE Orders to portions of the Maywood Site FUSRAP activities. This led to a key finding (RAD/CF-1) on failure to apply radioactive dose assessment methodologies mandated by DOE Orders to vicinity properties in the FUSRAP. To give perspective to the importance of this finding, individual doses to residents of some of the Maywood vicinity properties calculated (by methods currently used by FUSRAP) are on the order of 30 mrem/yr. The typical dose to the maximally exposed individual at most major DOE operating facilities is less than 5 mrem/yr.

Other weaknesses are that the FUSRAP has not yet implemented a formal self-assessment program, as described in Section 2.1.2 and in Finding MGT/CF-3, and that procedures have not been formally documented and reviewed.

Key findings were selected from the Audit findings for Maywood. These are findings or groups of findings related to the same issue which, in the judgment of the Audit Team, are keys to understanding the nature and scope of environmental problems at the Maywood Site. Key findings are:

- Deficiencies in Dose Assessment Methodologies - (RAD/CF-1) Dose assessment methodologies employed at the Maywood Site do not meet the requirements of DOE Orders and U.S. Environmental Protection Agency (EPA) regulations contained in 40 CFR Part 61. FUSRAP has not developed an overall, written site dose assessment plan, nor has it conducted complete dose assessment pathway analyses. The AIRDOS-PC computer program, first used this year to demonstrate compliance with 40 CFR Part 61 Subpart H, has not been checked against a "benchmark problem" to demonstrate that the software functions properly within the computer system operating environment. AIRDOS Subpart H modeling at the Maywood Interim Storage Site (MISS) did not include all potential sources at the site.
- Inadequate Self-Assessment Program - (MGT/CF-3) The U.S. Department of Energy-Oak Ridge Operations Office (DOE-OR) line management self-assessment program for FUSRAP does not fully meet the requirements established by the Secretary of Energy. The line management organization, which is the Former Sites Remediation Division (FSRD), does not conduct functional and management appraisals or formal surveillances of BNI. FSRD has developed a self-assessment program; however, it does not include specific operating procedures, including authorities, responsibilities, and planning requirements, nor does it specify involvement by senior DOE-OR and Headquarters management. Though it requires that root causes of deficiencies be determined, there is no formal requirement that root causes be addressed in action plans.
- Deficiencies in Community Relations Actions in Support of the RI/FS-EIS Process - (IWS/CF-1 and IWS/CF-2) The public information copy of the Administrative Record for the remedial investigation and feasibility study (RI/FS) and the National Environmental Policy Act (NEPA) actions to be taken at Maywood is housed in the Maywood Public Library. The Record is in disarray, with portions missing, and the librarian has not been trained on the purpose and maintenance of the Record. The Work Plan for the remedial investigation/feasibility study-

environmental impact statement (RI/FS-EIS) to be done at the Maywood Site has not yet been made available for public comment because the Notice of Intent to prepare an integrated RI/FS-EIS has experienced delayed review at DOE Headquarters. Nevertheless, the Maywood FUSRAP management staff is proceeding with the RI actions. On the current schedule, the RI work will be completed before public comments on the RI/FS Work Plan have been received and addressed.

- Inadequate Quality Assurance/Quality Control for Environmental Monitoring and Reporting Activities - (A/CF-1, A/CF-2, A/BMPF-1, A/BMPF-2, SW/BMPF-1, GW/CF-1, RAD/CF-2, RAD/BMPF-2, and QA/CF-1) This key finding consists of a group of findings relating to failures to formally document procedures, reconcile monitoring practices with established procedures, periodically review monitoring programs, and fully review and report monitoring data. For perspective, it must be stated that most of the Maywood-FUSRAP procedures are well-documented and reports are for the most part technically sound and complete. However, it is a broadly scoped program, and the noted deficiencies need to be addressed.

In summary, the Audit found the FUSRAP - Maywood Site to be well managed and moving effectively toward its objectives. There are, however, important discrepancies which need to be corrected.

1.0 INTRODUCTION

1.0 INTRODUCTION

This Environmental Audit report is for the Maywood Site, including vicinity properties. The Maywood Site is part of the Formerly Utilized Sites Remedial Action Program (FUSRAP). The FUSRAP is managed under the Assistant Secretary for Environmental Restoration and Waste Management. Most field activities are managed by the U.S. Department of Energy-Oak Ridge Operations Office (DOE-OR) Former Sites Remediation Division (FSPD), which reports to the OR Assistant Manager for Environmental Restoration and Waste Management (AM/ERWM). Project operations are managed by Bechtel National, Incorporated (BNI), under contract to DOE.

Secretary of Energy Notice (SEN)-6A-89 assigns to the Assistant Secretary for Environment, Safety and Health the responsibility for conducting environmental audits of DOE facilities and programs to ensure compliance with applicable laws and sound management practices related to environmental protection. These audits are to be carried out by "oversight" organizations such as EH, which are independent of the line management of the facilities and programs being audited. SEN-20-90 emphasizes the need for and value of audits by authorized oversight groups as a part of DOE's commitment to undertake all activities in an "environmentally sound manner."

The Environmental Audit Program of the DOE Headquarters Office of Environment, Safety and Health is designed to evaluate and improve the environmental management of DOE facilities and programs and to complement the responsibility of line management to conduct operations consistent with DOE policies on environmental protection and regulatory compliance.

1.1 Purpose

The purpose of the Environmental Audit of FUSRAP's Maywood Site is to provide the Secretary of Energy with concise information on the following areas:

- compliance with applicable environmental regulations (with the exception of National Environmental Policy Act [NEPA] requirements)
- adherence to best management practices (BMPs) and accepted technical practices
- DOE vulnerabilities and liabilities associated with compliance status, environmental conditions, and management practices
- root causes for noncompliances and failure to adhere to BMPs
- adequacy of environmental management programs and organizations

- response actions needed to address identified deficiencies or liabilities.

This information will assist DOE in determining patterns and trends in environmental compliance, BMPs, and root causes, and will provide the information necessary for line management to take necessary corrective actions.

1.2 Scope

The scope of the Environmental Audit is comprehensive, covering all environmental media and applicable Federal, state, and local regulations, with the exception of NEPA (auditing NEPA requirements is the responsibility of the DOE Headquarters Office of NEPA Project Assistance). All DOE Orders and formal facility or program operating procedures are covered, as well as BMPs. The technical areas addressed in the Audit include air, soils/sediments/biota, surface water, groundwater, waste management, toxic substances and chemical product management, radiation, quality assurance, and inactive waste sites. In addition, the Audit contains a review of the environmental monitoring programs and of the effectiveness of environmental management programs.

1.3 Approach

The Maywood Site Environmental Audit was conducted in accordance with the draft DOE Environmental Audit Guidance Manual (June 1990), the DOE Environmental Audit Program Manual (DOE/EH-0125), and accepted audit techniques. The Audit was conducted by a team managed by a DOE Headquarters Audit Team Leader and Assistant Team Leader from the Office of Environmental Audit and staffed by contractor technical support personnel. The names, areas of responsibility, affiliations, and biographical sketches of the team members are provided in Appendix A. The Audit included three phases: planning, on-site activities, and reporting.

During the planning phase, a memorandum was sent to FUSRAP officials announcing the Audit and requesting information about the site and the FUSRAP program in general. A pre-Audit site visit was conducted October 18 and 19, 1990. Information gathered from the information request memo and the pre-Audit site visit formed the basis for the Audit Plan, including the on-site agenda. Once on-site, the Audit Team modified the original agenda as more information was obtained and additional areas of interest were identified. The final daily agenda is contained in Appendix B, which contains the Maywood Site Audit Plan.

On-site activities took place from November 7 through November 16, 1990. Activities included interviews with FUSRAP personnel, both DOE and BNI, as well as Federal and state regulatory agencies; reviews of documents, including previous audits and self-assessment reports; inspection of facilities including vicinity properties; and observation of operations. The Audit Team conducted daily

debriefings which were open to FUSRAP and to the regulators. The lists of site documents reviewed and interviews performed are provided in Appendices C and D, respectively. Using these sources of information, the Team developed findings as discussed in Sections 2.0 and 3.0 of this report.

The problems identified were categorized as either "compliance" findings or "BMP" findings. Compliance findings are conditions that, in the judgment of the Audit Team, may not satisfy applicable environmental regulations, DOE Orders (including directional memoranda, where referenced), internal environmental policies and formal procedures, enforcement actions, permit conditions, or compliance agreements with regulatory agencies. BMP findings are derived from regulatory agency guidance, accepted industry practice or technical standards, draft DOE Orders or guidance, and professional judgment.

Within the two categories, each finding is prefaced by a Performance Objective(s). The Performance Objectives specify the particular compliance or BMP standards which are not being met. The findings are not arranged in order of relative significance.

In an effort to determine how the conditions leading to a finding occurred, a systematic approach was implemented to perform a "probable root cause" analysis. The apparent cause or causes are compiled and reasons for the selection of specific causes are developed and provided within the supporting information for each finding. These "causal factors" are then used to determine the full scope of corrective actions necessary to rectify the finding and to prevent recurrence.

1.4 Description of Facility

In 1974, the Atomic Energy Commission (AEC), a predecessor to DOE, instituted the FUSRAP, a program now managed by DOE. The objective of FUSRAP is to identify and clean up or otherwise control sites where there is residual radioactive contamination (exceeding current guidelines) from activities carried out under contract to the Manhattan Engineer District (MED) and AEC. In addition to these sites, the U.S. Congress authorized DOE to undertake remedial actions at four other sites where commercial operations had radioactively contaminated the environment. One of these four sites is in Maywood, New Jersey.

Past Maywood Chemical Works (MCW) operations in Maywood have resulted in contamination of numerous properties in Maywood, Rochelle Park, and Lodi, including the property previously owned by MCW (now owned by the Stepan Company); the DOE-owned property referred to as the MISS (Figure 1-1); and residential, commercial, and governmental vicinity properties (Figure 1-2). The MISS and vicinity properties are located in Bergen County, New Jersey and are approximately 20 kilometers (km) north-northwest of New York City and 21 km northeast of Newark, New Jersey. To organize and

LOCATION OF THE MAYWOOD INTERIM
STORAGE SITE (MISS)

FIGURE 1-1

LOCATIONS OF VICINITY PROPERTIES

FIGURE 1-2

segment the investigation and remedial actions at these properties, DOE has chosen to group them into four operable units:

- Stepan Company property
- MISS property
- Residential properties
- Commercial and governmental properties

Jointly, these four components comprise the Maywood Site.

The MISS is a 4.7-hectare (ha) (11.7-acre) fenced lot that was originally part of a 12.1-ha (30-acre) property owned by Stepan Company. The site contains a waste storage pile consisting of about 27,000 cubic meters (35,000 cubic yards) of contaminated materials, two buildings (Building 76 and a pumphouse), a reservoir and two rail spurs (Figure 1-2). The lot is bounded on the west by New Jersey Route 17; on the north by a New York, Susquehanna, and Western Railroad line; and on the south and east by commercial and industrial areas. Residential units are located north of the railroad line and within 100 m (328 ft) west of the MISS.

Eighty-two vicinity properties in Rochelle Park, Maywood, and Lodi are currently known to have been radioactively contaminated by the thorium-processing activities of the MCW. In Rochelle Park, these properties include the Ballod property and nine residential units. In Maywood, they include the Stepan Company property, the Sears warehouse and truck repair shop, eight other commercial properties, part of New Jersey Route 17, and nine residential properties. In Lodi, they include 50 residential, commercial, and governmental properties. These vicinity properties were contaminated by three mechanisms: storage and settling of liquid wastes and sludges in areas surrounded by earthen berms, and subsequent migration from these storage/settling areas; dissemination through use of dried sludge as fill and mulch; and surface water transport of contaminated sediments by Lodi Brook, a former stream whose headwaters originate near the MCW, and which is now largely channeled into culverts and buried.

1.5 Site History

From 1916 through 1956, the MCW processed monazite sand to extract thorium and rare earths for use in the manufacture of industrial products such as mantles for gas lanterns. The residues or tailings from the processing operation, a clay-like dirt, contained significant levels of radioactive and possibly chemical materials. Some of these process wastes were removed from the MCW for use as mulch and fill on nearby properties, thereby contaminating them. Some of the material also migrated off-site via natural drainage.

In 1954, the AEC issued License R-103 to the MCW, thereby allowing it to continue to process and distribute radioactive materials under the auspices of the Atomic Energy Act of 1954. Stepan Company purchased the MCW in 1959 and was issued an AEC radioactive

materials license in 1961. Based on AEC inspections and information related to the Ballod property west of Route 17, the Stepan Company agreed to perform a series of remedial actions from 1963 through 1968, when the AEC granted clearance for unrestricted release of the property.

In September 1980, an area resident discovered radioactive contamination on property that had formerly belonged to the Stepan Company. This was reported to the New Jersey Department of Environmental Protection (NJDEP). The state and the Nuclear Regulatory Commission (NRC) initiated a series of surveys and soil analyses which resulted in the U.S. Environmental Protection Agency (EPA) proposing the addition of the Maywood Site to the National Priorities List (NPL) in December 1982, and the final addition to the NPL in September 1983.

DOE was authorized to undertake a decontamination research and development project at the Maywood Site by the Energy and Water Appropriations Act of 1984, and the site was assigned by DOE to FUSRAP. In 1985, in order to expedite cleanup of the vicinity properties, Stepan Company transferred ownership of the 4.7-ha (11.7-acre) property which is now the MISS to DOE. Subsequently, DOE began a program of removal actions at the vicinity properties and environmental monitoring at the MISS as well as initiated a Remedial Investigation/Feasibility Study (RI/FS) as required by the National Contingency Plan (NCP).

**2.0 SUMMARY OF ENVIRONMENTAL AUDIT FINDINGS,
KEY ISSUES, AND CAUSAL FACTORS**

2.0 SUMMARY OF AUDIT RESULTS, KEY ISSUES, AND CAUSAL FACTORS

2.1 Line Management and Environmental Oversight

2.1.1 Program Strengths and Weaknesses

Strengths of the Formerly Utilized Sites Remedial Action Program (FUSRAP) include technical and regulatory knowledge, and program management.

The Audit Team found overall technical competence and knowledge of management and staff to be excellent. This applies to U.S. Department of Energy (DOE), as well as to Bechtel National, Inc. (BNI). In particular, there was excellent knowledge of Federal, state, and local environmental regulations, as well as analysis for applicability of these regulations to FUSRAP.

Project management of the Maywood Site is also excellent. BNI and DOE project staff have made frequent contact with members of the community, and all removal actions and remedial investigation activities have been planned, scheduled, and accomplished with competence and attention to total quality principles.

Weaknesses noted include self-assessment efforts by DOE, failure to fully implement DOE Order requirements throughout the program, and some discrepancies in formally documenting and reviewing procedures.

The most important weakness found was a failure to recognize or acknowledge the applicability of some DOE Orders to portions of the Maywood Site FUSRAP activities. This led to a key finding (RAD/CF-1) on failure to apply radioactive dose assessment methodologies mandated by DOE Orders to vicinity properties in the FUSRAP.

Other weaknesses are that the FUSRAP has not yet implemented a formal self-assessment program, as described in Section 2.1.2 and in Finding MGT/CF-3, and that procedures have not been formally documented and reviewed.

2.1.2 Self-Assessment and Oversight

2.1.2.1 Self-Assessment

In general, there is a lack of presence at the Maywood Site by DOE management, as well as a lack of formal surveillance of BNI activities by DOE, as indicated by Finding QA/CF-3.

The management review of the FUSRAP included an analysis of the U.S. Department of Energy-Oak Ridge Operations Office (DOE-OR) line management self-assessment program for the FUSRAP sites. The analysis of the line management self-assessment program is based on the January 26, 1990, directive to Secretarial and Operations Office Managers from Secretary Watkins requiring all line

management organizations to institute a formal self-assessment program, and on detailed self-assessment guidance issued by Secretary Watkins on July 31, 1990. This analysis concluded that the DOE-OR line management self-assessment program does not comply with substantive requirements in the Office of Environment, Safety and Health (ES&H) self-assessment guidance.

Within the DOE-OR, the Office of the Assistant Manager of Environmental Restoration and Waste Management (AM/ERWM) is the DOE line organization responsible for all DOE-OR environmental restoration and waste management activities. Under the AM/ERWM is the Former Sites Remediation Division (FSRD), which is the DOE line organization responsible for management of the FUSRAP sites. A formal self-assessment program for the AM/ERWM has not been developed. FSRD independently has developed a formal self-assessment program which meets many of the requirements specified by the ES&H self-assessment guidance. However, in part due to the absence of the top-tier self-assessment program from the AM/ERWM, deficiencies in the FUSRAP self-assessment program exist.

A fundamental element of the self-assessment guidance is that functional and management appraisals of contractors by DOE line management are required. FSRD does not conduct functional and management appraisals or formal surveillances of BNI. The FSRD self-assessment program includes informal evaluations of BNI, and relies on formal appraisals conducted by the DOE-OR Assistant Manager for Environment, Safety and Quality (AM/ES&Q), independent contractors, and BNI. The use of these resources in conducting self-assessments of the FUSRAP does not aid in developing self-assessment expertise in the DOE line organization.

2.1.2.2 Prioritization and Risk Assessment

Corrective actions resulting from audits, assessments, and functional appraisals are assigned a priority (I, II, or III) by BNI. Priority I are those deficiencies which pose an imminent threat to health, safety, or the environment and warrant a cessation of operations and/or immediate action. Priority II applies to deficiencies or situations judged as being out of compliance with a regulatory requirement, DOE Order, BNI policy, procedure, or directive. Priority III applies to deficiencies inconsistent with good industry practices or other recommended guidelines.

Within FUSRAP, individual sites, such as the Maywood Site, are assigned a risk designation of High, Medium, or Low when they are included in the program. These designations are based on a subjective analysis of potentials for human exposure and/or risk of release to the environment. However, the sites that make up the FUSRAP are not ranked among themselves based on risk. Investigation and remedial actions at the sites are scheduled based on a variety of concerns, including regulatory requirements, schedules agreed to in Federal Facility Compliance Agreements, and

project management considerations. There is considerable reprogramming of funds and activities (I-TL-3). Similarly, vicinity properties are informally categorized, with residential properties getting a higher priority than commercial and institutional properties. However, this process is not formalized, and the residential properties are not ranked by formally determined risk criteria.

2.1.3 Regulatory Agency Concerns

The U.S. Environmental Protection Agency (EPA) Region II and the New Jersey Department of Environmental Protection (NJDEP) were invited to participate in the Audit, and their concerns with the Maywood Site were solicited. EPA Region II attended the on-site activities, but did not indicate any specific concerns with compliance or other Maywood Site activities. The NJDEP also attended the on-site activities. The State of New Jersey wants to make sure that remedial activities at the Maywood Site are coordinated with the other FUSRAP sites in the state (Wayne and Middlesex). The NJDEP also maintains that the remedial alternative of siting a facility for final disposal of FUSRAP waste in New Jersey is not practical or cost-effective (I-TL-4). The DOE position is that under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), all feasible alternatives should be studied. The state has recently reached a decision on the cleanup of a similar site (Montclair, New Jersey), which involves removal and disposal of radioactively contaminated soils to a permitted facility in Utah. The state would like to see DOE do an abbreviated Remedial Investigation/Feasibility Study-National Environmental Policy Act (RI/FS-NEPA) analysis and dispose of all New Jersey FUSRAP wastes at that same facility (I-TL-4).

Relations between the FUSRAP Maywood group and the regulatory agencies are in general good. This is demonstrated by the cooperation evidenced in negotiating the Maywood Federal Facility Agreement (FFA), and by interviews with representatives of those agencies (I-TL-4, I-TL-5).

2.2 Summary of Findings

The Maywood Environmental Audit identified 31 findings and 1 Special Issue. Nineteen represented conditions which may not meet the requirements of Federal, state, or local regulations, DOE Orders, or internal FUSRAP procedures. Twelve are situations where conditions or practices may not adhere to best management practices (BMPs). Table 2-1 presents the findings and page numbers where they appear. The table also indicates whether the FUSRAP personnel were aware of the situation leading to the finding (or any portion of the finding), and whether the finding was identified in any of the previous audits or appraisals which the Audit team reviewed. It also shows the FUSRAP organization (DOE-OR, DOE Headquarters, or BNI) most directly concerned with the finding. The final column of

TABLE 2-1
ENVIRONMENTAL AUDIT FINDINGS

FINDING NUMBER	PAGE NUMBER	TITLE	APPRAISALS/AUDITS ¹ YES/NO	AFFECTED ORG. ²	REASON ³ D,I,R
A/CF-1	3-4	Noncompliance with Field Activities Instruction Guide	N(A)*	B	I
A/CF-2	3-6	Insufficient Analysis and Documentation of Measured Airborne Radionuclide Concentrations with Respect to Applicable DOE Limits	N(A)*	B	D
A/BMPF-1	3-8	Deficiencies in the Documentation and Siting of the Ambient Air Monitoring Network	N(A)*	B	D
A/BMPF-2	3-11	Inconsistencies and Deficiencies in the FUSRAP Integrated Environmental Activities Field Guide, Rev 1 (No. 14501-191-00-IG-03)	N(A)*	B	I
SSB/BMPF-1	3-19	Inadequate Secondary Containment for Petroleum Product Storage	N	B	-
SW/CF-1	3-24	Omission of Environmental Monitoring Data from the Annual Site Environmental Report	N	B	D
SW/BMPF-1	3-25	Inadequate Review and Documentation of Environmental Monitoring Locations and Analytical Parameters	N	B	D
SW/BMPF-2	3-28	Inadequate Characterization of Stormwater Discharge Pathways	(A)	B	D
GW/CF-1	3-35	Failure to Update and Comply with Instruction Guide 191-IG-007 Rev. 0	N	B	I
GW/BMPF-1	3-36	Failure to Adequately Monitor Groundwater Quality and Hydrogeologic Parameters	N(A)	B	D
GW/BMPF-2	3-37	Inadequate Groundwater Monitoring Well Maintenance	DO*	B-	
WM/CF-1	3-45	Inadequate Characterization of Maywood Waste	OC	B	R
RAD/CF-1	3-53	Deficiencies in Dose Assessment Methodologies	N	B	D,R

TABLE 2-1
ENVIRONMENTAL AUDIT FINDINGS

FINDING NUMBER	PAGE NUMBER	TITLE	APPRAISALS/AUDITS ¹ YES/NO	AFFECTED ORG. 2	REASON ³ D, I, R
RAD/CF-2	3-55	Tissue Equivalent Thermoluminescent Dosimeter Program Deficiencies	N(A)*	B	D
RAD/CF-3	3-57	Residual External Gamma Radiation Compliance Limit Discrepancies	N(A)*	B, H	D
RAD/CF-4	3-58	Environmental "As Low As Reasonably Achievable" (ALARA) Program Deficiencies	BN	B	D
RAD/BMPF-1	3-59	Site Characterization and Remediation Reporting Deficiencies	N	B	D
RAD/BMPF-2	3-61	Radiation Background Recording Deficiencies	BN	B	-
TCM/BMPF-1	3-64	Inadequate Asbestos Labeling, Inventory, and Characterization of Potentially Contaminated Areas	N	B	-
QA/CF-1	3-70	Lack of Quality Assurance Data in the Annual Site Environmental Reports	N	B	D
QA/CF-2	3-71	Lack of a Formal Lessons Learned Program	N	O, B	D
QA/CF-3	3-72	Lack of Formal Surveillance Activities on FUSRAP by DOE	N	O	D
QA/CF-4	3-73	Deficiencies Exist in the Control of FUSRAP Documents	N	B	I
IWS/CF-1	3-79	Administrative Record for Selection of Response Action	N(A)	B	D, R
IWS/CF-2	3-83	Community Relations in Support of the RI/FS - EIS Process	N(A)	O, B	D, R
IWS/CF-3	3-87	Natural Resource Trustee Responsibilities	N(A)	O, B	D, R
MGT/CF-1	3-96	Failure to Prepare Environmental Protection Plans As Required by DOE Order 5400.1	N(A)*	O, B	D

TABLE 2-1
ENVIRONMENTAL AUDIT FINDINGS

FINDING NUMBER	PAGE NUMBER	TITLE	APPRAISALS/AUDITS ¹ YES/NO	AFFECTED ORG. ²	REASON ³ D, I, R
MGT/CF-2	3-98	Inadequate SEN-7 Reports	N	O	D
MGT/CF-3	3-100	Inadequate Self-Assessment Program	N(A)	O	D
MGT/BMPF-1	3-102	Ineffective Communication Between Departments in the BNI FUSRAP Program	N(A)	B	-
MGT/BMPF-2	3-103	Inadequate DOE Surveillance Review of the BNI Management Control System	N(A)	O	D
SI-1	3-105	Ambiguities in FFA Language	N(A)		

¹ BN = BNI Audit 11/1/90
OC = ORNL Compliance Assessment 5/90
DO = DOE/OR Functional Appraisal 6/90
A = FUSRAP Personnel Aware of the Finding
* = FUSRAP Personnel Aware of Part of the Finding

² H = DOE Headquarters
B = BNI
O = DOE/OR

³ D = DOE Orders
I = Internal Procedure Requirement
R = Regulatory (EPA, State) Requirement

the table indicates the source (regulation, DOE Order, or internal FUSRAP procedure) of the Performance Objective for each finding.

Key findings were selected from the Audit findings for Maywood. These are findings or groups of findings related to the same issue, which, in the judgment of the Audit team, are keys to understanding the nature and scope of environmental problems at the Maywood Site. Key findings are:

- Deficiencies in Dose Assessment Methodologies - (RAD/CF-1) Dose assessment methodologies employed at the Maywood Site do not meet the requirements of DOE Orders and EPA regulations contained in 40 CFR Part 61. FUSRAP has not developed an overall, written site dose assessment plan, nor has it conducted complete dose assessment pathway analyses. The AIRDOS-PC computer program, first used this year to demonstrate compliance with 40 CFR Part 61 Subpart H, has not been checked against a "benchmark problem" to demonstrate that the software functions properly within the computer system operating environment. AIRDOS Subpart H modeling at the Maywood Interim Storage Site (MISS) did not include all potential sources at the site.
- Inadequate Self-Assessment Program - (MGT/CF-3) The DOE-OR line management self-assessment program for FUSRAP does not fully meet the requirements established by the Secretary of Energy. The line management organization, the FSRD, does not conduct functional and management appraisals or formal surveillances of BNI. FSRD has developed a self-assessment program; however, it does not include specific operating procedures, including authorities, responsibilities, and planning requirements, nor does it specify involvement by senior DOE-OR and Headquarters management. Though it requires that root causes of deficiencies be determined, there is no formal requirement that root causes be addressed in action plans.
- Deficiencies in Community Relations Actions in Support of the RI/FS-EIS Process - (IWS/CF-1 and IWS/CF-2) The public information copy of the Administrative Record for the RI/FS and the NEPA actions to be taken at the Maywood Site is housed in the Maywood Public Library. The Record is in disarray, with portions missing, and the librarian has not been trained on the purpose and maintenance of the Record. The Work Plan for the remedial investigation/feasibility study-environmental impact statement (RI/FS-EIS) to be done at the Maywood Site has not yet been made available for public comment because the Notice of Intent to prepare an integrated RI/FS-EIS has experienced delayed review at DOE Headquarters. Nevertheless, the Maywood FUSRAP management staff is

proceeding with the RI actions. On the current schedule, the RI work will be completed before public comments on the RI/FS Work Plan have been received and addressed.

- Inadequate Quality Assurance/Quality Control for Environmental Monitoring and Reporting Activities - (A/CF-1, A/CF-2, A/BMPF-1, A/BMPF-2, SW/BMPF-1, GW/CF-1, RAD/CF-2, RAD/BMPF-2, and QA/CF-1) This key finding consists of a group of findings relating to failures to formally document procedures, reconcile monitoring practices with established procedures, periodically review monitoring programs, and fully review and report monitoring data. For perspective, it must be stated that most of the Maywood-FUSRAP procedures are well-documented and reports are for the most part technically sound and complete. However, it is a broadly scoped program, and the noted deficiencies need to be addressed.

Figure 2-1 presents the total number of findings (compliance and BMP) for each medium or discipline audited. As can be seen, Radiation had the largest number of findings, with 6.

Figure 2-2 shows the numbers of findings associated with each of the FUSRAP management organizations. As might be expected, there is a close relationship between the level of interaction of the organization with the Maywood Site project and the number of findings attributed to each organization. BNI, as the project management contractor, has a total of 26; DOE-OR, as the FSRD manager, has 8; and DOE Headquarters, as the overall FUSRAP manager, has 4.

2.3 Summary of Findings by Discipline

Air - Issues identified during the Audit related to a lack of adequate documentation and periodic evaluation, a lack of sufficient training, and a lack of appropriate supervision in the ambient air monitoring program. Essential design and siting criteria of the monitoring network are not sufficiently documented and so do not meet requirements of DOE Orders. Likewise, previous evaluations of the adequacy of this network are not documented or were not performed on a periodic basis. Monitoring results are discussed in Annual Site Environmental Reports (ASERs); however, these are not provided with sufficient documentation to support the conclusions presented. Procedures governing activities in the field are deficient in providing guidance and suitable detail to ensure that appropriate practices and accurate documentation are maintained in the program. Furthermore, there is a lack of appropriate supervision in ensuring that procedures and training are being applied.

Total Findings By Discipline

Figure 2-1

Organizations Affected by Audit Findings

Figure 2-2

Soils/Sediments/Biota - In soils/sediments/biota there was a lack of adequate reviews of subcontractor activities with regard to spill prevention and cleanup. Indicative of this were the lack of secondary containment for a subcontractor-owned petroleum product container stored outside Building 76 and the presence of spilled materials on soils around the product storage locations. BNI effected cleanup of the spilled materials when notified of the situation by the Audit team.

Surface Water - With regard to surface water, the only water discharged from the Maywood Site is stormwater runoff; no sanitary or process water is discharged to surface water. Concerns identified during the Audit address omission of some environmental monitoring results from the ASER, the lack of formal review and documentation of monitoring programs, and inadequate characterization of stormwater discharges. The lack of formal review and documentation procedures for environmental monitoring locations and analytical parameters has resulted in errors and discrepancies in Environmental Monitoring Surveillance Program Plans and in plans for the ongoing RI at the Maywood Site. Not all potential stormwater runoff pathways and discharge points from the MISS have been adequately characterized. Plans exist to characterize these potential stormwater runoff pathways.

Groundwater - For groundwater, the MISS has not fully developed a Groundwater Protection Management Plan. Groundwater in the site area is contaminated, but the sources either on- or off-site have not been determined fully, and the groundwater has not been fully characterized with regard to non-radioactive constituents, nor the hydrogeology. An RI/FS is to be conducted during which the necessary data will be collected. Furthermore, characterization of the northwest portion of the site has not been fully addressed. Additional groundwater issues identified insufficient security, and surface protection for monitoring wells.

Waste Management - In the area of waste management, activities at the Maywood Site include the generation and storage of investigation-derived waste materials, including drill cuttings and low-level radioactive trash. Currently more than four hundred 55-gallon drums of waste materials are stored on-site in Building 76. The applicability of Federal and state hazardous waste management regulations to the Maywood Site must be considered in the context of CERCLA, since Maywood is an EPA-designated Superfund site and became subject to CERCLA requirements in 1986 when the Superfund Amendments and Reauthorization Act (SARA) required Federal agencies to comply. For activities conducted entirely on-site, CERCLA only requires compliance with the substantive technical provisions of applicable, or relevant and appropriate requirements (ARARs). The FUSRAP is deficient in properly characterizing investigation-derived waste materials which began accumulating on-site in 1984. No waste analysis has been conducted as required by both New Jersey and Federal hazardous waste management regulations. Therefore, the management of these waste may not be in accordance with

substantive technical standards of New Jersey's hazardous waste storage regulations. The FUSRAP is currently planning for development of a waste analysis plan to properly characterize stored wastes.

Radiation - In summarizing the environmental radiation assessment of the Maywood Site, the most serious issues of concern to the Audit team were dose assessment methodology deficiencies and site characterization and post-remedial action reporting deficiencies. Because the FUSRAP deals with properties where members of the public are in some cases exposed to radiation levels at significant percentages of acceptable limits, documentation of current conditions, exposure assessments, and remedial actions taken to correct these situations must withstand rigorous scrutiny for ultimate certification and release. To give perspective, individual doses (as calculated by current FUSRAP methodologies) to residents of select vicinity properties, because of proximity to contamination, exceed maximally exposed individual doses reported at numerous major DOE facilities. These calculated doses are on the order of 30 mrem/yr. Of all issues evaluated and discussed in the Audit findings, the lack of thorough exposure scenario discussions and non-site-specific background subtraction are considered to be the most serious deficiencies in the overall environmental radiation assessment program.

Other issues identified in the environmental radiation Audit relate to documentation of activities in a manner allowing independent verification. As much of this information feeds into evaluations of public exposure, rigorous adherence to requirements is necessary to support subsequent conclusions.

Toxic Materials and Chemical Products Management - In Toxic Materials and Chemical Product Management there was inadequate identification and characterization of asbestos-contaminated materials and locations at the MISS where asbestos contamination may be present. This could lead to the mismanagement and/or spread of asbestos materials into uncontaminated areas. Scrap process equipment that has been determined to contain asbestos was properly encased and labeled.

Quality Assurance - In quality assurance (QA) there was a lack of formal surveillances of FUSRAP activities by DOE and a lack of a formal lessons-learned program within BNI, thus indicating that problems affecting QA on the FUSRAP program may not be identified and that associated information, such as corrective actions, may not be adequately disseminated. Although the document control process for the FUSRAP is adequate, minor deficiencies in the control of FUSRAP documents indicate that insufficient, excessive, or outdated documentation may be employed on FUSRAP projects.

Inactive Waste Sites - Current responsibility for cleanup of radioactive and chemical contamination at the Maywood Site is divided between DOE and the EPA in accordance with the provisions

in the FFA. Although the FUSRAP is largely in compliance with the requirements of CERCLA and the FFA, three compliance findings were identified during the Audit. These findings deal with inadequate implementation of certain provisions of the National Contingency Plan (NCP) and DOE Order 5400.4. Deficiencies in maintenance of the Administrative Record, community relations activities, and performance of natural resource trustee notifications were identified. FUSRAP personnel were aware of these deficiencies.

Management - The management systems for DOE-OR and BNI that are in place for the FUSRAP are for the most part effective and responsive to the changing requirements and resources available to the program. However, deficiencies were found in DOE's surveillance and self-assessment programs, Secretary of Energy Notice (SEN)-7 reporting, and in the manner by which divisions and departments within the FUSRAP communicate at the project level. The absence of formal DOE surveillances of BNI activities is a deficiency due to the fact that although DOE maintains daily contact with and oversight of BNI on nearly all aspects of FUSRAP, formal surveillance activities as delineated in the Management Requirements and Policy Manual (MRPM) are not carried out.

An evaluation of the DOE line management self-assessment program was performed against the requirements specified in Secretary Watkins' self-assessment guidance, transmitted to Secretarial and Operations Office managers on July 31, 1990. This evaluation determined that the current DOE-OR line management self-assessment program for the FUSRAP is not in compliance with substantive provisions of this guidance. The major deficiency of this program is the lack of DOE line management functional and management appraisals of the FUSRAP Project Contractor (BNI).

A review of the FUSRAP's compliance with SEN-7 was also conducted. SEN-7 reports prepared by FUSRAP were determined to be incomplete and not prepared in accordance with SEN-7 and guidance issued by Headquarters.

2.4 Causal Factors Summary

In an effort to understand why a finding occurred, a systematic approach was implemented to perform a "probable root cause" analysis. This approach is initiated by a series of "why" questions concerning the apparent cause(s) of a finding. The cause(s) and rationale(s) are identified and placed in the supporting information for each finding. The causal factors are then used to determine the corrective actions required to rectify identified findings and to prevent recurrence. Definitions of the causal factors used are presented in Appendix G.

The Environmental Audit identified 10 apparent causal factors which contributed to the occurrence of the findings (see Table 2-2). The

TABLE 2-2
SUMMARY OF CAUSAL FACTORS IDENTIFIED BY AUDIT FINDING

Finding Number	Causal Factors										
	Policy	Policy Implementation	Procedures	Personnel	Resources	Training	Change	Risk	Appraisals, Audits/Reviews	Design	Human Factors
A/CF-1		X				X					X
A/CF-2			X						X		
A/BMPF-1		X				X			X		
A/BMPF-2						X			X		X
SSB/BMPF-1						X					X
SW/CF-1			X						X		
SW/BMPF-1			X						X		
SW/BMPF-2			X						X		
GW/CF-1		X				X					
GW/BMPF-1		X									
GW/BMPF-2		X	X								
WM/CF-1		X									

**TABLE 2-2 (Continued)
SUMMARY OF CAUSAL FACTORS IDENTIFIED BY AUDIT FINDING**

Finding Number	Causal Factors												
	Policy	Policy Implementation	Procedures	Personnel	Resources	Training	Change	Risk	Appraisals, Audits/ Reviews	Design	Human Factors	Barriers and Controls	Supervision
RAD/CF-1		X	X										
RAD/CF-2		X											
RAD/CF-3							X	X					
RAD/CF-4			X									X	
RAD/BMPF-1		X	X										
RAD/BMPF-2			X										
TCM/BMPF-1			X						X				
QA/CF-1		X				X							
QA/CF-2									X				
QA/CF-3					X				X				
QA/CF-4			X						X				
IWS/CF-1			X			X							
IWS/CF-2		X											
IWS/CF-3			X										

**TABLE 2-2 (Continued)
SUMMARY OF CAUSAL FACTORS IDENTIFIED BY AUDIT FINDING**

Finding Number	Causal Factors												
	Policy	Policy Implementation	Procedures	Personnel	Resources	Training	Change	Risk	Appraisals, Audits/ Reviews	Design	Human Factors	Barriers and Controls	Supervision
MGT/CF-1		X											
MGT/CF-2		X											
MGT/CF-3		X											
MGT/BMPF-1										X			
MGT/BMPF-2					X				X				
TOTAL	0	14	13	0	2	7	1	1	11	1	0	2	2

four causal factors that appeared most frequently are policy implementation, procedures, appraisals, and training (see Table 2-2). Each of these causal factors is discussed below.

Policy Implementation - appeared most frequently, in 45 percent of the findings, and was evident in all disciplines except Soils/Sediments/Biota, Surface Water, and Toxic Materials and Chemical Products Management. In many cases, the inability of the FUSRAP or the Maywood Project to fully implement Federal, state, and local regulations, DOE Orders, or BMP guidelines appeared to result from other factors, including inadequate procedures, training, and appraisals as identified on Table 2-2.

Procedures - appeared as a causal factor in 42 percent of the findings, most prominently in the Surface Water and Radiation disciplines. In these findings, FUSRAP and BNI procedures, such as Instruction Guides (IGs) and project manuals needed to ensure implementation of Federal, state, and local regulations, DOE Orders, or BMP guidelines were either incomplete or not being followed correctly by all applicable personnel.

Appraisals - appeared as a causal factor in 35 percent of the findings and was evident in the Air, Surface Water, Toxic Materials and Chemical Products Management, Quality Assurance, and Management disciplines. This factor appeared to contribute to findings insofar as FUSRAP and BNI internal audit/review processes were either missing or flawed and subsequently failed to identify existing problems.

Training - appeared as a causal factor in 23 percent of the findings and appeared in the Soils/Sediments/Biota, Groundwater, Quality Assurance, and Inactive Waste Sites disciplines. In these findings, personnel had not received the proper training to perform the functions for which they were charged or the training was not documented.

Other causal factors, appearing in less than 10 percent of the findings, include:

- Resources or materials available to implement programs and procedures;
- Changes in regulations or program activities;
- Perception of the relative degree of risk associated with program activities;
- Design of systems or programs;
- Administrative and physical barriers; and
- Adequate oversight and supervision of personnel.

Figure 2-3 presents the number of findings associated with each causal factor.

The following sections present the specific findings, by discipline, identified by the Environmental Audit and discuss in greater detail the causal factors that appeared to contribute to them.

Number of Findings Per Causal Factor

Figure 2-3

Other - Causal Factors Which Appeared in Less Than 10% of the Findings

3.0 ENVIRONMENTAL AUDIT FINDINGS

3.0 ENVIRONMENTAL AUDIT FINDINGS

3.1 Air

3.1.1 Overview

The Maywood Interim Storage Site (MISS) is located in northern New Jersey approximately 21 kilometers (km) (13 miles [mi]) northeast of the City of Newark. The closest National Weather Service station which reports local climatological data (LCD) is at the Newark International Airport (EWR). These data may be considered representative of the general climatology at the MISS due to its proximity to EWR and the lack of significant terrain features at both locations.

The mean annual wind speed is approximately 5 meters per second (mps) (11 miles per hour [mph]) and prevails from the southwest annually. Prevailing wind directions vary from northeasterly and northwesterly in January through April to strictly southwesterly for the remaining months. Mean monthly wind speeds range from about 4 to 5 mps (9 to 11 mph). The maximum mean monthly precipitation is about 11 centimeters (cm) (4 inches [in]), occurring in August, and the mean annual water equivalent is about 108 cm (42 in). On an annual basis the mean temperature is near 12°C (54°F) with mean daily temperatures ranging from about 8° to 17°C (46°F to 63°F).

The ambient air monitoring network at the Maywood Site was established to monitor gaseous radionuclide emissions resulting from operations at the MISS and from background sources. Air pollutant sources at the Maywood Site are primarily fugitive emissions from the storage pile and from contaminated surface soil adjacent. The radionuclides monitored are radon-220 (Rn-220) and radon-222 (Rn-222). The network consists of 19 monitoring stations (A-2), 16 of which are on-site at the MISS and distributed around the site perimeter and at several in-property locations. The remaining three are background locations in Rochelle Park and Paterson, New Jersey. Each monitoring station is equipped with paired Tech Ops/Landauer type F (Rn-220 and Rn-222) and type M (Rn-222 only) detectors (A-1). Rn-222 concentrations are derived directly from microscopic inspection of the detectors, while Rn-220 concentrations are derived from a difference in the paired data. In addition to these, Rem AT 100 Rn-222 detectors are also being used but only for the purpose of evaluating their performance.

Data from the ambient air monitoring network are reported in the Annual Site Environmental Report (ASER) and used to assess radiological doses to the public resulting from operations at the MISS.

The purpose of the ambient air monitoring program Audit was to assess the program with respect to applicable Federal, state, and local regulations, U.S. Department of Energy (DOE) Orders, and

program requirements. Table 3-1 provides a list of documents which contain applicable regulations, orders, and requirements. The general approach to the air Audit included the following activities: 1) an examination of the Maywood Site and associated ambient air monitoring network; 2) interviews with current and former Bechtel National, Inc./Formerly Utilized Sites Remedial Action Program (BNI/FUSRAP) personnel; and 3) a review of program files and documents related to the site.

The air monitoring program at the MISS is adequate to meet the original objectives of the program. However, several deficiencies were noted during the Audit.

Investigations during the Audit resulted in four findings. There were two compliance findings which relate to air monitoring program requirements and analysis of data with respect to DOE Orders. There were also two best management practice (BMP) findings which related to deficiencies in the documentation and procedures associated with the air monitoring network as well as inconsistencies in monitoring program reports and procedures.

3.1.2 Findings

A/CF-1 Noncompliance with Field Activities Instruction Guide

Performance Objective: FUSRAP Integrated Environmental Field Activities Instruction Guide, Rev. 1 (No. 14501-191-00-IG-03) (IG) stipulates the procedures to be followed for exchange and shipment of radon/thoron samples and Tissue Equivalent Thermoluminescent Dosimeters (TETLDs).

The IG stipulates, "All monitoring stations and sampling locations are inspected weekly" and further states that results are to be recorded on the specified Environmental Monitoring Weekly Site Inspection Forms.

Finding: Field activities performed in support of the ambient air monitoring program are not in compliance with the IG. The following deficiencies were noted on the 1990 Field Exchange Logs (FELs) and on Weekly Site Inspection Forms and are inconsistent with the referenced guide:

- The exchange dates recorded in the Second Quarter Rem and Terrader (i.e., Tech Ops/Landauer) FELs (A-13) were provided for only the first recorded site with no indication whether this date is applicable to subsequent entries. In addition, the serial numbers of the detectors were not fully recorded. Field observations by

TABLE 3-1
LIST OF APPLICABLE AIR
REGULATIONS/REQUIREMENTS/GUIDELINES

<u>Regulations/ Requirements/ Guidelines</u>	<u>Section/Title</u>	<u>Authority</u>
40 CFR 61	Clean Air Act Implementing Regulations Subpart H	EPA
DOE Order 5400.1	General Environmental Protection Program	DOE
DOE Order 5400.5	Radiation Protection of the Public and the Environment	DOE
DOE Order 5400.xy	Radiological Effluent Monitoring and Environmental Surveillance	DOE
DOE Order 6430.1A	General Design Criteria	DOE
FUSRAP Instruction Guide No. 14501-191-00- IG-03	FUSRAP Integrated Environmental Monitoring Field Activities Instruction Guide	BNI
BNI Project Instruction 23.205	Compliance with Subpart H on NESHAP	BNI

the Audit team and log entries indicate that both types of detectors use a six-digit serial number. In all but four entries, three or fewer digits are recorded.

- No exchange dates were provided on page 2 of the 1990 Third Quarter Rem FEL or any pages of the 1990 Third Quarter Terradex FEL (A-6).
- The "installed detectors" serial numbers were recorded in the "Comments" column in all Third Quarter Terradex FELs and "removed detector" serial numbers for sites 12, 13, and 15 through 17 were recorded in the "Detector Installed" column.
- There is no "removed detector" serial number entered for site 18 on the Third Quarter Terradex FEL and no explanation is provided.
- The site identification on page 3 of the Third Quarter Terradex FEL is 138-WISS. (WISS is the acronym for Wayne Interim Storage Site, not the MISS.)
- On one page of the First Quarter TETLD FEL, two entries of serial numbers were found without indication of location. Additionally, numbers observed by the Audit team on TETLDs in the field at sites 2, 8, and 15 consisted of a nine-character alpha-numeric code. The IG only discusses a four-digit identification number and requires that this number be recorded.
- The IG is inconsistent with regard to data logging information required during detector and TETLD exchange. For example, all three procedures require the logging of serial or identification numbers during exchange; however, only the exchange date is required as additional information for the Terradex detectors while only site locations are required as additional information for the Rem and TETLD detectors.
- The Weekly Site Inspection Forms being used by field personnel are not those specifically required by the IG (Exhibit 4-6 in the guide) and were not specific to the MISS. Furthermore, these forms do not provide the information called for on the specified form. Consequently, there is no documentation to verify that the inspections detailed in the IG were performed. Additionally, in a review of the September and October 1990 forms (A-14), no evidence was found to indicate that an inspection of the MISS and associated off-site environmental monitoring stations had been performed between October 13 and October 28, 1990. However, all previous and subsequent documentation provided records of weekly inspection activities.

Findings RAD/CF-2 and A/BMPF-2 provide further discussions on data recordkeeping.

FUSRAP personnel were aware of the incomplete recording of detector serial numbers and missing exchange dates but were not aware of the remaining issues.

This finding was not included in any DOE line management self-assessment, as none has been completed. These specific conditions were not included in any audit or appraisal which was reviewed. However, a similar finding was made in the FUSRAP Audit No. 56 of August - September 1990 conducted by BNI (Corrective Action Request No. 2-EPP).

Causal factors appear to be a lack of policy implementation, inadequate training, and a lack of appropriate supervision in that it is not being assured that required procedures are being applied in the field.

A/CF-2 Insufficient Analysis and Documentation of Measured Airborne Radionuclide Concentrations with Respect to Applicable DOE Limits

Performance Objective: DOE Orders 5400.1, 5400.5 and 5400.xy stipulate that environmental monitoring data collected to determine compliance with applicable limits be documented in a manner capable of supporting conclusions and information reported in the ASER.

Finding: Rn-220 and Rn-222 concentrations measured at monitoring site 5 at the MISS and reported in the ASERs for calendar years 1986 through 1989 (A-10 through A-12) exceeded limits specified in DOE Order 5400.5. For the past 4 years these data were neither compared to the applicable DOE limits nor documented in a manner that supported the conclusion stated in the ASERs that the dose to the maximally exposed individual, resulting from DOE operations, would be indistinguishable from that received from background sources.

FUSRAP personnel were aware of the requirement to demonstrate compliance with DOE specified limits but were unaware that data collected to determine compliance must be documented in a manner capable of supporting conclusions based on them.

This finding was not included in any DOE line management self-assessment, as none has been completed. In addition, the finding was not included in any program audit or appraisal which was reviewed.

Causal factors appear to include a lack of audits and appraisals in that a sufficient review of the reports supporting environmental compliance of impacts from the MISS should ensure that all DOE reporting requirements are met, and failure to implement procedures to ensure that reports comply with DOE Orders.

A/BMPF-1

**Deficiencies in the Documentation and Siting of the
Ambient Air Monitoring Network**

Performance Objective: DOE Order 5400.1 stipulates in Chapter IV the following requirements, which are to be implemented no later than November 11, 1991:

- An Environmental Monitoring Plan (EMP) must be developed for each DOE site or facility which releases or manages significant pollutants or hazardous materials.
- The EMP must contain the rationale and design criteria for the monitoring program.
- The EMP must be reviewed annually and updated every 3 years.

Draft DOE Order 5400.xy stipulates the following:

- An evaluation shall be conducted and used as the basis for establishing an environmental surveillance program. The results of this shall be documented in the EMP to show sampling locations used for determining ambient environmental levels resulting from facility operations.
- It is essential that overall objectives for environmental monitoring programs be established, including determination of compliance with applicable public exposure limits. It is imperative that the program be reviewed periodically.
- Unless documented site specific evidence exists to justify otherwise, air samples should be collected at a height of 2 m (6 ft) in a location free from localized effects (e.g., a large building or trees) that could result in artificially low or high concentrations.
- An annual review of the radionuclide emissions shall be made and compared with those used to establish the site EMP. Any deviations from routine environmental surveillance requirements, including measurement station placement, must be documented in a revised EMP.

Finding There are deficiencies in the documentation and siting of the MISS ambient air monitoring network.

Insufficient progress has been made to meet the requirements of Chapter IV of DOE Order 5400.1 and Draft DOE Order 5400.xy. Deficiencies resulting from this lack of progress are detailed below:

- Review of the MISS EMP (A-1) revealed that no rationale was presented for the configuration of the radon/thoron

ambient monitoring network. The prevailing wind direction was the only consideration given for design criteria for the network configuration. Interviews with FUSRAP personnel (I-A-1, I-A-2) determined that the current EMP has not been reviewed with respect to applicable DOE Orders, nor have any plans been initiated to effect this review.

- An evaluation of the siting of on-site radon/thoron monitoring stations was performed by FUSRAP personnel (I-A-4) to assess the adequacy of the network. In addition, annual monitoring results were assessed to ensure that the objectives of the program were being met. However, the information and associated procedures were not compiled in a formal document which could serve as guidance in the future. Interviews with FUSRAP personnel (I-A-1, I-A-2) indicate these types of evaluations have not continued on a periodic basis.

A review of the radon/thoron monitoring network during the Environmental Audit revealed the following deficiencies in the siting of monitoring stations, which may bring into question the validity of the data collected:

- Of the 10 on-site and 2 off-site monitoring stations visited, none were located at the recommended height of 2 m.
- Both off-site monitoring stations inspected were situated 1 m or less from large structures.
- Of the 10 on-site monitoring stations inspected, one was within 1 m of a dirt mound approximately 2 m high.

A review of the 1989 ASER (A-12) revealed a discrepancy between the field location of radon/thoron monitoring station 2, as observed during the Audit, and its location as depicted on Figure 3-1. Interviews with FUSRAP personnel (A-I-9) revealed that this station had originally been located at the point indicated on Figure 3-1 but was subsequently relocated. It was also indicated that the station was located at the Figure 3-1 location until at least mid-1988 (I-A-4). No documentation was found on the relocation nor could an exact date of relocation be determined. As a result Figure 3-1 of the ASER for at least 1989 (as well as the EMP [A-1], and Field Instruction Guide [A-2] which also use this figure) does not accurately show the current location of station 2.

FUSRAP personnel were aware of this finding for all issues except the relocation of station 2. Action to remove the dirt mound from the vicinity of monitoring station 5 has been initiated (A-15).

This finding was not included in any DOE line management self-assessment, as none has been completed. This finding was not included in any program audit or appraisal which was reviewed.

The causal factors that led to the development of this finding appear to be the lack of policy implementation in that sufficient progress has not been made to meet the requirements of applicable DOE Orders, inadequate training in that practices performed in the past were not conveyed to subsequent or current project personnel, and the lack of appraisals, audits, or reviews, which should have previously identified these deficiencies.

A/BMPF-2

**Inconsistencies and Deficiencies in the FUSRAP
Integrated Environmental Activities Field Guide,
Rev 1 (No. 14501-191-00-IG-03)**

Performance Objective: Guidance provided to personnel performing field activities in support of environmental monitoring programs for the MISS should be complete, accurate, and of sufficient detail to allow for the recording of traceable and verifiable information.

Finding: Inconsistencies and deficiencies in the FUSRAP IG (A-2) were noted with regard to descriptions and procedures relating to the radon/thoron monitoring network as noted below:

- There is no requirement stated in the IG for the field personnel to have access to the guide at all times while in the field.
- A total of 19 radon monitoring locations are identified in the IG. Adequate descriptions of these locations are provided for all but locations 15, 16, and 17.
- The radon/thoron detectors identified on page 57 of the IG call for the use of Tech Ops/Landauer type F and type M detectors. The subsequent exchange procedure for type F and type M detectors on page 58 only describes the steps for exchange of a detector using a "white membrane filter". No indication is given as to whether this is for a type F or type M detector and no description is provided for exchange of a second unit.
- The procedures call for data entries to be made by field personnel on FELs. However, there is no requirement for field personnel to sign or initial and date these entries to facilitate the tracking of sample handling.
- No detailed packaging instructions for detectors are provided in the procedures even though this packaging involves safeguards to the exposed detectors suggested by the manufacturer as described by FUSRAP personnel (I-A-8). As indicated by an interview with FUSRAP personnel, the appropriate procedures were being followed; however,

no documentation could be provided to support this (I-A-9).

- The IG provides a discussion on FELs which indicates their use for recording field data during exchange of several different types of detectors. An example of this log is presented in Exhibit 4-2 but no instructions are provided for proper completion for each of the detector exchanges (see A/CF-1 for further discussion on FEL data recordkeeping). A similar lack of guidance for form completion was noted in the discussion of Track Etch data sheets used for shipping samples. Discussion with FUSRAP personnel (I-A-8) revealed that field personnel are trained in proper completion of all forms; however, no documentation of this could be provided. Additionally, this training was not apparent in the FELs and Data Sheets (A-6 and A-13), reviewed as these showed inconsistent and incomplete recording of serial numbers, missing exchange dates, and data recorded in inappropriate columns.
- The IG discusses chain of custody (COC) and it states that the COC "provides a clear and accurate written record which can be used to trace possession of a sample" from collection through subsequent use of reported data. The same section also addresses the use of COC seals to ensure the integrity of samples. There is no requirement nor any documentation to demonstrate COC for radon/thoron samples. Additionally, there is no requirement for a COC seal for any air samples, although these are required for all other types of samples. FUSRAP personnel (I-A-6) indicated that the Field Data Sheets (presented as Exhibits 4-3 and 4-4 in the IG) serve as COC forms for radon/thoron detectors. A review of these forms (A-6 and A-13) revealed that they were not maintained in a manner that would allow a clear and accurate record of tracing sample possession. For example, there was no provision for or documentation of shipping and receiving samples from collection to analysis and finally receipt of results.

FUSRAP personnel were aware of the lack of COC forms as discussed in this finding. Action has been initiated to rectify this situation. However, FUSRAP personnel were not aware of the other issues addressed in this finding.

This finding was not included in any DOE line management self-assessment, as none has been completed. Neither was this finding included in any program audit or appraisal which was reviewed.

The probable causal factors are a lack of in-depth audits and appraisals in that the IG is not reviewed in sufficient detail to ensure adequate description of field practices and recordkeeping,

ineffective training of field personnel, and a lack of appropriate supervision in that it is not being assured that procedures demonstrated in training are being applied in the field.

3.2 Soils/Sediments/Biota

3.2.1 Overview

The purpose of the soils/sediments/biota portion of the Environmental Audit of the Maywood Site was to 1) evaluate the environmental monitoring programs, 2) evaluate the potential and actual contamination of these media by hazardous constituents as a result of past and present operations, and 3) compare the environmental monitoring data for these media with applicable concentration guidelines and requirements.

Most of the following information is summarized from the Draft Work Plan for the Remedial Investigation/Feasibility Study-Environmental Impact Statement for the Maywood Site, Maywood, New Jersey (July 1990).

The Maywood Site is located in the glaciated section of the Piedmont Plateau of north-central New Jersey. The terrain is generally level, with minor relief created by occasional shallow ditches and low mounds; elevations range from 15 to 20 m (50 to 68 ft) above mean sea level. The surface slopes gently to the west and is poorly drained (Cole et al., 1981).

Bedrock underlying the Maywood Site consists of igneous and sedimentary rock of Triassic age. The Brunswick Formation has alternating beds of reddish-brown sandstone, mudstone, and shale, and ranges from 1,800 to 2,400 m (5,900 to 7,900 ft) in thickness (Carswell and Rooney, 1976). This formation contains three basalt units (Watchung Basalt), ranging from 110 to 260 m in thickness. Erosion of the sedimentary rock has created prominent ridges in the more resistant basalt.

The area is part of an apparently broad, diffuse region of seismic activity that extends north-northeast from New Jersey to New Brunswick, Canada. However, although numerous earthquakes have been recorded locally, they are typically of low magnitude and cause little structural damage.

Historically, the unconsolidated glacial till in the Maywood area was capped with a well-developed deciduous forest soil. However, extensive agricultural and urban development has disturbed or destroyed much of this original soil horizon, and most of the current soil cover in the area may now be classified as urban fill.

The region of the Maywood Site is within the Eastern Deciduous Forest Province (Bailey, 1978). However, this original forest habitat has been destroyed, first by agricultural then urban development. Prior to recent removal actions on the Ballod property and the Maywood Interim Storage Site (MISS), these areas supported an early successional community dominated by grasses and forbs with scattered shrubs and trees. The residential properties, including those which have undergone removal actions, contain

species common to landscaped yards, such as grasses, garden vegetables, flowers, shrubs, and trees.

Animal life is not abundant, based on the lack of viable habitat. Species present are those adapted to urban environments. Bird species include the house sparrow, red-winged blackbird, common crow, common grackle, starling, mourning dove, robin, and wood thrush. Mammals include the Norway rat, house mouse, meadow vole, raccoon, eastern cottontail rabbit, opossum, and eastern gray squirrel. Woodchuck burrows were observed at the Maywood Site by the Audit team. A small number of reptile and amphibian species probably inhabit the area (ANL, 1984).

Aquatic habitats are limited to drainageways, small temporary ponds, Westerly and Lodi Brooks, and the Saddle River. Westerly Brook traverses the MISS portion of the Maywood Site, but is encased in concrete pipe beneath the site. Lodi Brook originates on the Sears property; however, much of it has been incorporated into a subsurface storm drain system. Surface-feeding ducks have been observed on the Saddle River and accessible portions of Westerly Brook. Mosquito larvae, beetles, snails, isopods, midges, aquatic worms, and other invertebrates typically occur in these habitats and in stream and temporary pond habitats.

Protection and remediation of soils, sediments, and biota at the Maywood Site are primarily mandated by U.S. Department of Energy (DOE) Orders and by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as indicated in Table 3-2. DOE is responsible for enforcement of these requirements.

Although soils at the MISS and vicinity properties are contaminated with radioactive materials and possibly with chemical constituents, there is no finding on the soil contamination in this section. The very reason for existence of the Formerly Utilized Sites Remedial Action Program (FUSRAP) and the Maywood Site is the recognized presence of this contamination. Instead, this Audit focuses on the effectiveness of the Maywood Site portion of the FUSRAP in addressing the contamination. Therefore, all the findings in the Audit Report should be viewed as assessing the status and quality of monitoring, protection, and remediation of soils, sediments, and biota.

Taken together, the findings indicate that the Maywood Site portion of the FUSRAP is very effective in addressing the soil contamination, with exceptions as described in the findings. This section does contain one finding on inadequate secondary containment for one 55-gallon drum of petroleum product.

TABLE 3-2
LIST OF APPLICABLE SOILS/SEDIMENTS/BIOTA
REGULATIONS/REQUIREMENTS/GUIDELINES

<u>Regulations/ Requirements/ Guidelines</u>	<u>Section/Title</u>	<u>Authority</u>
DOE Order 5400.1	General Environmental Protection Program	DOE
DOE Order 5400.xy (Draft)	Radiological Effluent Monitoring and Environmental Surveillance	DOE
DOE Order 5400.4	Comprehensive Environmental Response, Compensation, and Liability Act Program	DOE
40 CFR 761	Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions	EPA
40 CFR 260-280	Resource Conservation and Recovery Act	EPA
	FUSRAP Guidelines	DOE
40 CFR 300	National Contingency Plan	EPA
CERCLA/SARA	Section 120 Federal Facilities	EPA

3.2.2 Finding

SSB/BMPF-1 Inadequate Secondary Containment for Petroleum Product Storage

Performance Objective: Storage practices for the management of petroleum products, such as diesel fuel, should include the use of secondary containment to prevent spills or releases from entering the environment. Additionally, spills or releases need to be cleaned up immediately to prevent the spread of contamination.

Finding: The lack of secondary containment for a 55-gallon drum of diesel fuel located adjacent to Building 76 at the MISS could lead to the release of diesel fuel to the environment through various spills and releases.

A 55-gallon drum of diesel fuel, owned by a site subcontractor, was situated on a broken wooden pallet adjacent to and west of Building 76 without any type of secondary containment. During the removal of stained soil from a previous release of hydraulic oil in the same area and replacement of the broken pallet, it was determined that a quantity of diesel fuel had been spilled or released. The soil stained with hydraulic oil and diesel fuel was removed and drummed. Clean material was backfilled into the area.

Maywood Site personnel were not aware of this situation, although drum management findings were identified in the Bechtel National, Inc. (BNI) Audit Report (September 1990).

The causal factors which led to the development of this finding appear to be inadequate training of subcontractor personnel with regard to spill prevention, and lack of barriers and controls.

3.3 Surface Water

3.3.1 Overview

The Maywood Site lies within the Saddle River drainage basin. The Maywood Interim Storage Site (MISS) is located approximately 0.8 kilometer (km) (0.5 mile [mi]) east of the Saddle River (a tributary of the Passaic River) and approximately 1.6 km (1 mi) west of the drainage divide of the Hackensack River basin. Drainage conditions at the site are poor. Rainwater runoff from the MISS empties into the Saddle River via Westerly Brook, which flows under the site and Route 17 through a concrete storm drain and eventually empties into the Saddle River. Neither the Saddle River nor Westerly Brook is used as a source of potable water. The former Lodi Brook now is channeled into buried culverts and provides drainage to the south.

The MISS has no active surface water effluents and requires no permits. Potential applicability of pending U.S. Environmental Protection Agency (EPA) stormwater discharge permit requirements has not yet been determined. The Formerly Utilized Sites Remedial Action Program (FUSRAP) has requested guidance from the New Jersey Department of Environmental Protection (NJDEP), but no reply has been received.

Passive effluents (stormwater runoff) are regulated by requirements in U.S. Department of Energy (DOE) Orders, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and the Maywood Site Federal Facility Agreement (FFA) to monitor and control contaminant migration off-site via surface water erosion. Applicable DOE Orders and Federal and state regulations are identified in Table 3-3.

No sanitary or process wastewater is generated at the MISS. The only water generated is stormwater runoff. Stormwater discharges to the ground surface and may enter local surface water (Westerly Brook). Westerly Brook flows through a storm sewer system beneath the MISS. The storm sewer system is leaking, allowing infiltration of groundwater into the storm sewer (see Section 3.4 for additional information on groundwater). Smoke testing of newly discovered sewers beneath the MISS is planned in an effort to further characterize the stormwater discharge pathways from the site, as described in Finding SW/BMPF-2.

Westerly Brook water and sediment are sampled upstream and downstream of the MISS as part of the environmental monitoring program. Westerly Brook flows into the Saddle River, which is located approximately one-quarter mile (400 to 500 m) west of the MISS. Surface water and sediment in Saddle River are also sampled during routine environmental monitoring. Additional sampling of these water bodies is planned as part of the Remedial Investigation (RI) for the Maywood Site.

TABLE 3-3
LIST OF APPLICABLE SURFACE WATER
REGULATIONS/REQUIREMENTS/GUIDELINES

<u>Regulations/ Requirements/ Guidelines</u>	<u>Section/Title</u>	<u>Authority</u>
40 CFR 122 and 125	National Pollutant Discharge Elimination System	EPA
40 CFR 136	Test Procedures for the Analysis of Pollutants	EPA
DOE Order 5400.1	General Environmental Protection Program	DOE
DOE Order 5400.5	Radiation Protection of the Public and the Environment	DOE
DOE Order 5400.xy	Radiological Effluent Monitoring and Environmental Surveillance	DOE
NJAC 7:9-4	New Jersey Surface Water Quality Criteria	NJDEP
NJAC 7:14A	New Jersey Pollutant Discharge Elimination System	NJDEP
191-00-IG-03	FUSRAP Integrated Environmental Monitoring Field Activities Instruction Guide	BNI
DOE Order 5484.1	Environmental Protection, Safety, and Health Protection Information Reporting Requirements	DOE

The headwaters of the former Lodi Brook are located on property adjacent to the MISS. Discharges from the former Maywood Chemical Works (MCW) lagoons migrated via Lodi Brook and caused much of the contamination problems in Lodi. Most of the original stream has since been replaced by a subsurface storm drain system.

The environmental monitoring program for surface water and sediment is adequate for radionuclides; however, there are data gaps for organic compounds and heavy metals. Until the fall of 1990, there had been no monitoring of surface water or sediment for chemical parameters. This is a key consideration, since chemically contaminated groundwater infiltrates into the Westerly Brook storm sewer (I-SW-15). Additional monitoring and investigations are planned to fill known data gaps. The additional monitoring of surface water and sediment for organics and heavy metals should fill remaining data gaps with respect to the environmental monitoring program.

Although the environmental monitoring program is improving, there is no formal periodic review of monitored sites and parameters to ensure the adequacy of the environmental monitoring program. This was indicated by discrepancies between RI planning documents and errors or omissions in instruction guides for environmental monitoring, as described in Finding SW/CF-1.

Three surface water findings were identified at the Maywood Site. One is a compliance finding and two are best management practice (BMP) findings. The compliance finding deals with the omission of environmental monitoring results from the Annual Site Environmental Report (ASER). The BMP findings deal with review and documentation of monitoring programs and characterization of stormwater discharges.

3.3.2 Findings

SW/CF-1 Omission of Environmental Monitoring Data from the Annual Site Environmental Report

Performance Objective: DOE Order 5400.1 requires that programs for monitoring the environment be conducted at DOE sites to determine the background levels and site contribution of radioactive or chemical contamination to the environs. The Order also requires that an ASER be prepared to summarize and interpret the results of monitoring at DOE sites.

Finding: Environmental monitoring data for Lodi Brook are not included in the ASER; thus, the contribution of radioactive contamination to Lodi Brook was not summarized and interpreted as required by DOE Order 5400.1.

Surface water and sediment samples have been collected from Lodi Brook and analyzed for radioactivity since July 1989 as part of the MISS environmental monitoring program (SW-33, SW-34). The

analytical results were not included in the MISS ASER for 1989 (SW-8), though the 1989 report did include monitoring data for all other sampling locations that comprise the environmental monitoring program.

FUSRAP project personnel were not aware of this finding, and it was not included in any DOE line management self-assessment, as none has been completed, or in Bechtel National, Inc. (BNI) audits or appraisals.

Causal factors for the finding appear to be inadequate procedures and appraisals, audits, and reviews. Personnel responsible for preparation of the ASER were not aware of the need to include the results for Lodi Brook, and the omission was not detected during review of the document.

**SW/BMPF-1 Inadequate Review and Documentation of
Environmental Monitoring Locations and Analytical
Parameters**

Performance Objective: Environmental surveillance programs and environmental monitoring plans should be reviewed regularly and revisions documented so that characteristics and trends in conditions of environmental media can be identified and new or existing environmental quality problems can be quantified.

Finding: The lack of formal review and documentation procedures for environmental monitoring locations and analytical parameters has resulted in errors and discrepancies in Environmental Surveillance Program Plans and in plans for the ongoing RI at the Maywood Site.

The original Environmental Monitoring Plan (EMP) (SW-25), dated September 1984, states that priority pollutant analyses will be conducted on four surface water and sediment samples during baseline monitoring. The 1984 ASER (SW-3) does not include analytical data from priority pollutant analyses and indicates six monitoring locations for surface water and sediment instead of the planned four locations. Four of these locations (a manhole on the Westerly Brook storm sewer, the Saddle River, and two locations on the Ballod property) did not correspond to the locations given in the EMP. There is no procedure in place that would have required a discussion in the 1984 ASER on the rationale for the change or addition of monitoring locations and the absence of priority pollutant data.

In the FUSRAP Integrated Environmental Monitoring Field Activities Instruction Guide (IG) (SW-15), dated October 1990, surface water and sediment Monitoring Station 4 is identified as Lodi Brook. Available quarterly monitoring results for 1990 (SW-21) also indicate that samples were collected at Monitoring Station 4. In previous ASERs and Summaries (SW-3, SW-4, SW-5, SW-6, SW-7, SW-8), Monitoring Station 4 is identified as a manhole that is not

accessible because the cover was welded shut. There is no procedure in place that would require documentation of the rationale that was used to change the location of Monitoring Station 4.

Groundwater contaminated with organic compounds (SW-8) infiltrates into the storm sewer system that conveys Westerly Brook under the site (I-SW-15). The outfall of this pipe, Monitoring Station 2, is a sampling location in the environmental monitoring program. Currently, there is no analysis of samples from Monitoring Station 2 for organic compounds (SW-8) except for pending analysis of total organic carbon (TOC) and total organic halogens (TOH) (SW-35). Annual sampling and analysis of surface water and sediment for organic compounds are to be included as part of the environmental monitoring program beginning in July 1991 (I-SW-18). These analyses are not included in the IG (SW-15). Additionally, the Remedial Investigation/Feasibility Study-Environmental Impact Statement (RI/FS-EIS) Work Plan (SW-23) indicates that surface water and sediment samples are to be analyzed for organic compounds. However, the RI/FS-EIS Field Sampling Plan (SW-30) does not include the analysis of surface water and sediment samples for organic compounds. Discussions with FUSRAP personnel indicate that the Work Plan is incorrect, as analysis of surface water and sediment for organic compounds is not planned for the RI but is to be included as part of the environmental monitoring program (I-SW-18).

FUSRAP project personnel were not aware of this finding, and it was not included in any DOE line management self-assessment, as none has been completed, or BNI audits or appraisals.

The causal factors for this finding appear to be inadequate procedures and appraisals, audits, and reviews. There is no formal procedure to determine the adequacy of monitoring locations or the parameters analyzed. Reviews have not identified discrepancies in site planning documents.

SW/BMPF-2 Inadequate Characterization of Stormwater Discharge Pathways

Performance Objective: Environmental monitoring should be conducted in a manner that will establish well-defined histories of the conditions of local surface water. Environmental surveillance programs should also be undertaken to determine the need for a permanent surveillance program.

Finding: Not all potential stormwater runoff pathways and discharge points from the MISS have been adequately characterized.

A vault containing several underground sewers of unknown origin and discharge location has been discovered at the MISS. After the storage pile was constructed, vegetation on the site was allowed to overgrow, thus preventing the discovery of this potential

contaminant transport pathway. It is suspected by FUSRAP personnel that one or more of the pipes in the vault discharge to Westerly Brook (I-SW-6, I-SW-15); however, this has not been confirmed. Westerly Brook is part of the existing environmental program. The possibility exists that discharges from the vault do not flow to Westerly Brook and thus are not being sampled during routine environmental monitoring.

FUSRAP project personnel were aware of this finding and plan to perform smoke testing of the sewers in an attempt to further characterize stormwater drainage pathways from the MISS. Vault discharges are to be included in the environmental monitoring program if they do not flow into Westerly Brook. This finding was not included in any DOE line management self-assessment, as none has been completed, or BNI audits or appraisals.

The causal factors for this finding appear to be inadequate procedures and appraisals, audits, and reviews. There is no formal procedure to evaluate the adequacy of monitoring locations. Reviews have not identified the need for prompt investigation of newly discovered site features that could affect surface water quality.

3.4 Groundwater

3.4.1 Overview

Groundwater at the Maywood Site is impacted or potentially impacted by off-site upgradient chemical and radiological contamination, on-site and off-site areas of Formerly Utilized Sites Remedial Action Program (FUSRAP) waste contamination not yet remediated, and possibly from the pile of contaminated soil stored on-site on and under Hypalon liners in case of a breach in the liner.

It has not yet been determined what the impacts are of FUSRAP or non-FUSRAP sources on the site. This is an objective of the Remedial Investigation/Feasibility Study (RI/FS) to be done on-site.

There are no New Jersey Pollution Discharge Elimination System (NJPDDES) required permits at this time, but there is the potential for the New Jersey Division of Hazardous Waste Management to require a permit, since their jurisdiction supersedes that of the expired NJPDDES permits.

Applicable regulations that dictate groundwater quality protection and management include the requirements of U.S. Department of Energy (DOE) Orders, New Jersey Administrative Code (NJAC) regulations, and the Federal Facility Agreement (FFA). Industry guidance includes publications developed as part of both the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) programs by the U.S. Environmental Protection Agency (EPA). Best management practices (BMPs) are current practices in industry and government programs.

The Federal regulations and State of New Jersey regulations, DOE Orders, and EPA guidance documents applicable to the site are identified in Table 3-4.

The sediments which underlie the Maywood Site are divided into two units, the unconsolidated surficial deposits (overburden) and the underlying sandstone (bedrock) aquifer. The overburden is principally Quaternary-age glacial till, a heterogeneous mixture of sand, silt, clay, gravel, cobbles, and occasional boulders. The thickness of the overburden varies from about 0.6 to 7 m (2 ft to 22 ft). The Triassic-age Brunswick Formation lies beneath the unconsolidated sandy overburden and consists mainly of a fine-grained, well-cemented, reddish sandstone with some conglomerate and occasional interbeds of shale. The sandstone and shale exhibit thinly laminated bedding, and the dip of the beds ranges from nearly horizontal to nearly 20 degrees. The upper 4.5 to 6 m (15 to 20 ft) often contain numerous vertical to nearly vertical, fresh to slightly weathered, open fractures. The storage and movement of groundwater within the bedrock appear to be confined to these secondary openings (GW-9).

TABLE 3-4
LIST OF APPLICABLE GROUNDWATER
REGULATIONS/REQUIREMENTS/GUIDELINES

<u>Regulations/ Requirements/ Guidelines</u>	<u>Section/Title</u>	<u>Authority</u>
DOE Order 5400.1	General Environmental Protection Program	DOE
NJAC 7:14A-1 et seq	Regulations Concerning the New Jersey Pollutant Discharge Elimination System	NJDEP
NJSA 58:10A-1 et seq	Water Pollution Control Act	NJDEP
NJSA 13:1E-1 et seq	Solid Waste Management Act	NJDEP
NJAC 7.26	Hazardous Waste Management Regulations	NJDEP
40 CFR Parts 261-270	Hazardous Waste Regulations	EPA
	RCRA Groundwater Monitoring Technical Enforcement Guidance Document	EPA
	Guidance for Conducting RI/FS Under CERCLA	EPA
	Guidance on Remedial Actions for Contaminated Groundwater at Superfund Sites	EPA
IG 191-IG-007 Rev. 0	Water Level and Precipitation Measurement	BNI

Current information developed on the site indicates that the surficial groundwater table is generally shallow, lying 1.2 to 3.7 m (4 to 12 ft) below the ground surface. Groundwater in the Maywood area is available primarily from the bedrock aquifer and also from the overlying unconsolidated surficial deposits. Wells that draw from the unconsolidated surficial deposits generally have low yields and are used for domestic purposes. However, some wells located in areas with thicker surficial units of stratified glacial deposits have high yields and have been developed for industrial and public uses (GW-6). Water level measurements over the past 5 years show seasonal fluctuations, generally with the highest levels in the spring and the lowest levels in the fall and winter. The groundwater flow in the upper unit is in the westerly direction with a gradient ranging from 0.006 to 0.008 foot per foot depending on the season. The upper unit well in the northwest corner of the site has been dry for most of the monitoring periods; therefore, the direction and gradient in this area are unknown.

The potentiometric surface of the semiconfined bedrock groundwater aquifer is from 2.1 to 5.2 m (7 to 17 ft) below the ground surface. The groundwater flow direction in this unit is radial toward the northwest, west, and southwest at a gradient from 0.006 to 0.008 foot per foot (GW-9).

There is routine monitoring of groundwater at the Maywood Interim Storage Site (MISS). Groundwater level measurements were taken weekly until 1990 and then biweekly. Groundwater quality sampling has been conducted quarterly since 1985. Groundwater has been analyzed for metals; some inorganic mobile ions; priority pollutants; and radionuclides, including uranium, thorium, and radium. Groundwater has not been analyzed for sulfate or for sulfide, constituents used in the extraction of thorium from the monazite sand. Volatile organics have been detected in wells on-site since 1985 and some of these constituents have been detected in the upgradient wells in addition to the on-site wells. Some of these constituents in on-site and upgradient wells exceed drinking water standards or Maximum Concentration Limits (MCLs) (GW-2, GW-6).

The groundwater program at the MISS is adequate in most areas, and the analytical parameter list is extensive.

However, groundwater protection and monitoring at the MISS do not meet certain compliance and BMP requirements. Some wells on-site have been dry for more than three monitoring periods (quarters) and the site has not replaced them as required by New Jersey Department of Environmental Protection (NJDEP) regulations. Wells have not been kept locked to protect their integrity, and several well pads are cracked or otherwise deteriorated and do not prevent surface infiltration from entering the annular space around the casing. Precipitation measurements have not been taken according to the instructions in the Instruction Guide for Water Level and Precipitation Measurement. Characterization of the hydrogeologic

regime over the northwest portion of the site has not been adequate.

The findings that follow this overview detail the specific aspects of the MISS groundwater monitoring and characterization that do not meet compliance and BMP requirements. There are one compliance finding and two BMP findings for groundwater at the Maywood Site. The compliance finding deals with failure to revise the IG. The first BMP finding deals with failure to replace dry wells, and therefore failure to adequately characterize the hydrogeology, and the second with inadequate monitoring well maintenance and proper surface protection requirements.

3.4.2 Findings

GW/CF-1 Failure to Update and Comply with Instruction Guide 191-IG-007 Rev. 0

Performance Objective: The Instruction Guide for Water Level and Precipitation Measurement, FUSRAP Sites, 191-IG-007 Rev. 0 stipulates that precipitation is to be measured daily and that the location of the precipitation station is to be shown on Drawing 138-DD000-C05.

Finding: Current monitoring practices do not comply with the Instruction Guide (IG).

Changes have been made to the frequency that data are collected and recorded pursuant to the Instruction Guide for Water Level and Precipitation Measurement, FUSRAP Sites, 191-IG-007 Rev. 0 (GW-8), and the guide has not been revised to show these changes. In the guide it is stated that precipitation measurements are to be taken daily, while actually the measurements are taken weekly (GW-15). The guide states that the location of the precipitation station is to be shown on the drawing, and it is not shown on Drawing 138-DD000-C05 (GW-12).

The Maywood Site personnel responsible for reviewing and revising Instruction Guides for the site were not cognizant of the difference between the guide and current site practices.

This finding was not included in any of the DOE line management self-assessments, audits, or appraisals.

The causal factors that contributed to this finding appear to be inadequate policy implementation of FUSRAP, caused by inadequate training, supervision, and procedures. The site monitoring personnel did not follow the existing guide regarding measuring procedures, partially as a result of inadequate training.

Failure to Adequately Monitor Groundwater Quality and Hydrogeologic Parameters

Performance Objective: DOE Order 5400.1, Chapter IV, Section 5.b requires environmental surveillance to monitor any effects of DOE activities on on-site and off-site environs. Section 9.b requires that groundwater monitoring programs be designed to determine baseline conditions of quality and flow, demonstrate compliance with regulations and DOE Orders, and provide data to permit early detection of groundwater pollution or contamination.

Also a memorandum dated August 24, 1989 from James Fiore, NE-23, to Peter Gross, U.S. Department of Energy-Oak Ridge Operations Office (DOE-OR), titled Chemical Contamination at FUSRAP Sites (GW-11) states, "In general, we should also characterize chemical wastes associated with DOE predecessor operations to determine if the operations caused chemical contamination of the site or the surrounding environs. DOE-owned facilities must be monitored for any chemical contamination whether it is due to predecessor operations or non-DOE related activities."

Finding: The FUSRAP Maywood Site groundwater level measurement and the groundwater sampling procedures do not meet the intent of DOE Order 5400.1.

Groundwater monitoring wells were installed in October and November 1984 (GW-9), and in 1985 only one sample was collected from wells 1A and 5A, and 5A-1 was dry (GW-2). In 1986 wells 1A, 4A, 5A-1 and 7A were dry during all sampling periods (GW-3), in 1987 wells 1A, 4A and 5A-1 were dry during all periods (GW-4), in 1988 wells 1A, 5A, 5A-1 and 7A were dry during all periods (GW-5). Finally in 1989 wells 1A, 5A, 5A-1 and 7A were dry during all periods (GW-6). The wells that were dry for more than three sampling periods were not replaced, re-completed, or sealed as specified by New Jersey requirements. Also because of the dry wells, FUSRAP personnel were unable to take water level measurements or groundwater samples and were unable to draw groundwater contours for the whole site, and therefore do not completely understand the groundwater flow in the upper unconsolidated overburden aquifer.

Data analyzed for 1984-1989 have not been looked at for trends on nonradiological data, and significant changes during the years have not been explained in the annual monitoring summaries.

The Maywood Site personnel were aware of this situation; however, it does not appear in any self-assessment, audit, or appraisal.

The causal factor that may have contributed to this finding appears to be inadequate policy implementation. The policy of following all requirements of DOE Orders was not followed.

Performance Objective: BMPs typically provide that monitoring wells be kept in a condition such that chain of custody (COC) can be maintained, potential for vandalism minimized, and surface infiltration minimized.

Finding: Some monitoring wells at the MISS are not adequately secured or maintained.

The hinge on the locking cap on Well MISS 6B was broken, the locks on wells B38W5B and B38W01S were unlocked, and the locking cap for well B38W01S was on the ground.

The intent of locking caps is to prevent unauthorized access to the wells, to ensure the integrity of the monitoring system, and to guarantee COC requirements.

Concrete surface seals (pads) were broken on several wells; and B38W5B, MISS 4B, B38W18D, and MISS 2A and 2B had no visible pads. Annulus seals or cement surface pads are constructed to prevent the downward migration of pollutants around the casings. The four wells with inadequate cap and lock maintenance represented 12 percent of the wells on-site. The five wells with broken or missing well pads represented 15 percent of the wells on-site.

BMPs provide that wells be maintained in order to ensure the integrity of the monitoring system. This is especially important with regard to COC requirements. Wells that are not locked could permit unauthorized access, allowing for possible adulteration or contamination of the well by vandals. Cracked seals allow for the introduction of surface infiltration along the casing.

Site personnel were aware of the condition of the well seals and the broken hinge but this is not documented in the Weekly Inspection and Annual Inspection Reports reviewed (GW-15), and also they were not aware of the unlocked wells. Conditions reported on the inspection forms sometimes have not been repaired for as long as 4 months, and there is no place on the inspection form to indicate completed actions that required repair.

Procedures for annual well inspections to determine if maintenance is required were recently instituted (10/5/90) and have not yet resulted in identifying problems with wells and repairing them.

Portions of this finding were included in a DOE Environmental Safety and Health & Quality Assurance (ESH&QA) Functional Appraisal, June 1990 (GW-18). BNI has written a Corrective Action Request for annual inspections of the wells and is considering adding an "action taken" portion to the inspection forms (I-GW-20).

The causal factors that contributed to this finding appear to be policy implementation and procedures. There is a policy to inspect the casing pads for damage and to repair them (GW-1).

3.5 Waste Management

3.5.1 Overview

The applicability of hazardous waste regulations at the Maywood Site must be analyzed with respect to its status as a U.S. Environmental Protection Agency (EPA) designated Superfund site. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and its implementing regulations promulgated in the National Contingency Plan (NCP) require that actions (including the handling, treatment, or disposal of investigation-derived wastes) conducted on Superfund sites comply only with the substantive technical provisions of applicable, or relevant and appropriate requirements (ARARs) (including Federal and state hazardous waste management regulations). Compliance with administrative requirements for actions taken completely on-site is not required.

The general approach to the waste management portion of the Audit included discussions with both U.S. Department of Energy (DOE) and Bechtel National, Inc. (BNI) Formerly Utilized Sites Remedial Action Program (FUSRAP) staff; review of FUSRAP documents, procedures, correspondence, and other records; and observation of the Maywood Site and associated activities. The information collected from these activities was evaluated with respect to applicable Federal and state regulations and DOE Orders, as identified in Table 3-5, and current industry best management practices (BMPs).

Waste materials routinely generated at the Maywood Site include radioactively contaminated soils collected from site characterization activities (i.e. drill cuttings from the installation of groundwater monitoring wells in areas of radioactive and chemical contamination) and radioactive trash consisting of low-level radioactive waste from site investigations and maintenance (i.e., shoe covers, gloves, etc.). Due to their radioactive nature, these waste materials are drummed and stored in an on-site warehouse (Building 76). The current inventory of waste in Building 76 exceeds four hundred 55-gallon drums.

In September 1989, 27 drums in Building 76 were determined to contain corrosive Resource Conservation and Recovery Act (RCRA) hazardous waste (RCRA hazardous waste code D002). These drums have subsequently been treated to eliminate their corrosive characteristic (I-ATL-3). The treatment consisted of drying with drum heaters to evaporate free liquids so that the drummed material would pass the paint filter test.

TABLE 3-5
LIST OF APPLICABLE WASTE MANAGEMENT
REGULATIONS/REQUIREMENTS/GUIDELINES

<u>Regulations/ Requirements/ Guidelines</u>	<u>Section/Title</u>	<u>Authority</u>
DOE Order 5400.1	General Environmental Protection Program	DOE
DOE Order 5400.3	Hazardous and Radioactive Mixed Waste Program	DOE
DOE Order 5820.2A	Radioactive Waste Management	DOE
New Jersey Administrative Code Title 7, Subtitle F, Chapter 26	Hazardous Waste Management Regulations	NJDEP
40 CFR 260-271	Hazardous Waste Management Regulations	EPA

Waste materials in Building 76 are required, pursuant to New Jersey and Federal hazardous waste regulations, to be characterized for hazardous waste characteristics. The New Jersey Administrative Code (NJAC) Sections 7:26-8.9 to 7:26-8.15 have primacy over Federal regulations for the characterization of waste materials with the exception of 40 CFR 261.24, which was recently modified and requires the use of the Toxicity Characteristic Leaching Procedure (TCLP) for determination of the leachability of specific hazardous substances. Federal regulations under this provision would be applicable to the Maywood Site pending adoption by New Jersey.

BNI is currently planning the development of a waste analysis plan to determine the presence of RCRA hazardous waste in the drummed waste in Building 76. If the results of this waste analysis effort indicate that RCRA wastes are present in drums stored in Building 76, the substantive technical standards of NJAC requirements for hazardous waste storage would be applicable (NJAC 7:26-9 and 7:26-10). Building 76 in its current condition would not meet all substantive technical requirements, including the requirements for crack-free floors and efficient drainage design.

The waste management program for Building 76 on the Maywood Interim Storage Site (MISS) appears to be adequate in most areas. Waste materials are stored in steel drums (apparently in good condition) and are stored on pallets with sufficient aisle spacing to allow for visual inspections of potential leaks. With the exception of one drum found during the Audit, drums were labeled and included in a comprehensive inventory of Building 76. After the field Audit, the unlabeled drum was labeled to identify its contents as radioactive trash from site investigations. One area of concern is the potential release of liquids from uncharacterized drums with respect to the noticeable cracks in the Building 76 floor.

Although the drum inventory includes information on the presence of liquids, FUSRAP personnel do not know the locations of liquid-containing drums among the more-than 400 drums in Building 76. Therefore, the weekly inspections of Building 76 can not focus on the liquid-containing drums, which present the greatest potential environmental hazard due to the inherent potential for mobility of liquids.

One waste management finding was identified for the Maywood Site. It addresses the lack of proper characterization of wastes currently stored in Building 76. An additional finding in the waste management area is included as a component of a compliance finding (MGT/CF-1) in the management section (Section 3.10). This finding involves the failure of the FUSRAP program to prepare a Waste Minimization Program Plan and a Pollution Prevention Awareness Program Plan as required by DOE Order 5400.1.

3.5.2 Finding

WM/CF-1 Inadequate Characterization of Maywood Wastes

Performance Objective: NJAC 7:26-8.5 and Federal regulations promulgated in 40 CFR 262 require generators of solid waste to determine if that waste is a hazardous waste as defined in NJAC Sections 7:26-8.9 to 7:26-8.15 and 40 CFR 261, respectively. The characterization of investigation-derived waste is considered to be an applicable requirement pursuant to CERCLA.

Finding: Waste materials currently stored in Building 76 have not undergone adequate characterization as required by NJAC 7:26-8.5 and 40 CFR 262.

These waste materials, which consist of over four hundred 55-gallon drums, include radioactively contaminated soils collected from site characterization activities (i.e., drill cuttings from the installation of groundwater monitoring wells in areas of radioactive and chemical contamination) and radioactive trash consisting of low-level radioactive waste from site investigations and maintenance (i.e., shoe covers, gloves, etc.).

It should be noted that the site was not subject to RCRA provisions of CERCLA until 1986 when the Superfund Amendments and Reauthorization Act (SARA) reauthorized CERCLA and required Federal agencies to comply with ARARs.

In September 1989, BNI conducted pH sampling of drums in Building 76 that contained liquids and determined that 27 drums contained liquids with a pH greater than or equal to 12.5 (classified as RCRA hazardous waste code D002). These drums have subsequently been treated to eliminate their corrosive characteristic. The treatment consisted of drying the free liquids using drum heaters, so that the remaining waste would pass a paint filter test. No detailed chemical characterization has been conducted on any of the drums stored in Building 76 (I-ATL-3).

A drum of thorium 232-contaminated diesel fuel was placed into storage in Building 76 after its presence was discovered in July 1990. BNI has not determined the status of this material as a waste. This drum of diesel fuel is believed to have been left in the field by a subcontracted drilling crew during the fall of 1989. Although BNI has not classified this material as a waste, no appropriate uses for it have been identified (I-ATL-3). Potential industrial and commercial uses of the fuel would pose as low as reasonably achievable (ALARA) concerns, even if diluted prior to use.

BNI is currently planning the development of a waste analysis plan to determine the presence of RCRA hazardous waste in the drummed waste in Building 76. If the results of this waste analysis effort indicate that RCRA wastes are present, or that the drum of thorium-

contaminated diesel fuel constitutes a hazardous waste, either by definition, as a listed waste oil pursuant to NJAC 7:26-8.13, or by exhibiting the characteristic of ignitability as defined by NJAC 7:26-8.9, substantive technical standards of NJAC requirements for hazardous waste storage would be applicable (NJAC 7:26-9 and 7:26-10). Building 76 in its current condition would not meet all substantive technical requirements, including the requirements for crack-free floors and efficient drainage design.

One additional area of concern is the potential release of liquids from uncharacterized drums with respect to the noticeable cracks in the Building 76 floor. Although the drum inventory includes information on the presence of liquids, FUSRAP personnel do not know the locations of liquid-containing drums among the more-than 400 drums in Building 76. Therefore, the weekly inspections of Building 76 can not focus on the liquid-containing drums, which present the greatest potential environmental hazard due to the inherent potential for mobility of liquids.

FUSRAP personnel were aware of the finding prior to this Audit. The finding was included in the May 25, 1990 Oak Ridge National Laboratory audit, "Formerly Utilized Sites Remedial Action Program Environmental Compliance Assessment Findings for Maywood Interim Storage Site...." (WM-2). The finding was not included in any DOE line management self-assessment, as none has been completed.

The probable causal factor is the inadequate policy implementation of state and Federal hazardous waste regulations. DOE FUSRAP management failed to determine the need to conduct characterization of the stored waste materials in Building 76.

3.6 Radiation

3.6.1 Overview

Radiation sources at the Maywood Site include contamination in the soil of the site, contaminated soil in the pile of materials removed from the vicinity properties, and contamination in the soil and some structures on the vicinity properties.

The background radiation in the vicinity of the Maywood Site is both natural and man-made. Sources include cosmic radiation, natural radioactive materials in the soil (particularly relevant to this evaluation), fallout from past worldwide atmospheric weapons detonations, and accidental releases. The radiological environmental monitoring program at the Maywood Site evaluates ambient air for radon-222 and 220 using Trak-Etch detectors penetrating radiation using Tissue Equivalent Thermoluminescent Dosimeters (TETLDs), water effluents for thorium, uranium, and radium, and soil samples for thorium, uranium, and radium.

As part of the environmental radiation protection Audit, reviews were coordinated with other team specialists to ensure that all potential radiation protection problem areas were evaluated in sufficient detail. Coordination with other specialists concentrated on: Surface Water, Air, and Groundwater specialists, to evaluate monitoring programs and effluent controls; and the Inactive Waste Site specialist, to evaluate the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) issues affecting this site.

As part of the radiation assessment, site characterization and post-remedial action reports were evaluated for a representative number of the 82 vicinity properties which have been identified so far. The on-site portion of the Audit included visits to numerous vicinity properties including residential, commercial, and municipal properties.

Maywood Site environmental radiation protection and monitoring programs were assessed against the requirements for ensuring radiation protection of the public and the environment contained in U.S. Department of Energy (DOE) Orders and Formerly Utilized Sites Remedial Action Program (FUSRAP) guidelines, as well as U.S. Environmental Protection Agency (EPA) regulations. These requirements include; environmental monitoring, compliance with dose standards, dose assessment methodologies, control of airborne and liquid discharges, and radioactive materials. Table 3-6 contains a list of applicable radiation regulations/requirements/guidelines evaluated during this Audit. The Maywood Site releases relatively small amounts of radioactivity in airborne and liquid discharges.

The Audit team noted deficiencies in dose assessment methodologies, the TETLD program, and the As-Low-As-Reasonably-Achievable (ALARA)

TABLE 3-6
LIST OF APPLICABLE RADIATION
REGULATIONS/REQUIREMENTS/GUIDELINES

<u>Regulations/ Requirements/ Guidelines</u>	<u>Section/Title</u>	<u>Authority</u>
DOE Order 5400.1	General Environmental Protection Plan	DOE
DOE Order 5400.5	Radiation Protection of the Public and the Environment	DOE
Draft DOE Order 5400.xy	Radiological Effluent Monitoring and Environmental Surveillance	DOE
DOE Order 5484.1	Environmental Protection, Safety and Health Protection Information Reporting Requirements	DOE
DOE Order 5820.2A	Radioactive Waste Management	DOE
40 CFR 192	Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings	EPA
DOE Order 5482.1B	Environment, Safety and Health Appraisal Program	DOE
DOE Order 5400.4	Comprehensive Environmental Response, Compensation, and Liability Act Program	DOE
40 CFR 61	National Emission Standard for Hazardous Air Pollutants Subparts H and Q	EPA
DOE/EV-1830-T5	A Guide to Reducing Radiation Exposure to As Low As Reasonably Achievable (ALARA)	DOE
DOE/CH/8901	A Manual for Implementing Residual Radioactive Material Guidelines	DOE
BNI Procedures	FUSRAP Integrated Environmental Monitoring Field Activities Instruction Guide, 4.6.1 Thermoluminescent Dosimeter Exchange	BNI

TABLE 3-6 (Continued)
LIST OF APPLICABLE RADIATION
REGULATIONS/REQUIREMENTS/GUIDELINES

<u>Regulations/ Requirements/ Guidelines</u>	<u>Section/Title</u>	<u>Authority</u>
TMA/Eberline Procedures	Health Physics Operational Procedures Manual, 3B.2 Near Surface Gamma-Ray Radiation Survey, 3B.4 Walkover Gamma-Ray Scan, 3C.2 Determination of Background, 4A.1 Systematic and Bias Surface Soil Sampling	TMA/ Eberline
FUSRAP	Summary Protocol Identification- Characterization-Designation Remedial Action-Certification	DOE
ANSI/ANS-10.3- 1986	Guidelines for the Documentation of Digital Computer Programs	ANSI/ANS

Program. Site characterization and post-remedial reporting deficiencies were also noted. Radiation-related findings also appear in the Air section of this report.

From the environmental radiation perspective, the FUSRAP program is generally effective in seeking out and characterizing soil contamination needing remediation with the exception of important discrepancies as documented in these findings.

3.6.2 Findings

RAD/CF-1 Deficiencies in Dose Assessment Methodologies

Performance Objective: Dose assessments shall be documented and performed in a manner that ensures compliance with Federal and DOE requirements specified in 40 CFR Part 61, DOE Orders 5400.1 and 5400.5, and Radiological Effluent Monitoring and Environmental Surveillance Regulatory Guide for 10 CFR 834 (formerly Draft DOE Order 5400.xy). FUSRAP activities shall also be conducted in accordance with DOE/CH/8901 "A Manual for Implementing Residual Radioactive Material Guidelines". In addition to DOE Order requirements governing use of computer codes for dose assessment activities, ANSI/ANS 10.3-1986, "Guidelines for the Documentation of Digital Computer Programs," should be followed.

Finding: Dose assessment methodologies at the Maywood Interim Storage Site (MISS) (the DOE-owned portion of the Maywood Site) are not sufficiently documented to demonstrate full compliance with Federal regulatory and DOE requirements. Deficiencies noted affect both the storage pile and the area surrounding the pile. The following dose assessment deficiencies were observed during review of the program with FUSRAP personnel:

- An overall, written site dose assessment plan for compiling, evaluating, and reporting the environmental monitoring and calculated data used in dose assessment does not exist (I-R-6). Such a plan helps to ensure that dose assessments are as accurate and realistic as practical in accordance with DOE Orders 5400.1, 5400.5, and Radiological Effluent Monitoring and Environmental Surveillance Regulatory Guide for 10 CFR 834 (formerly Draft DOE Order 5400.xy);
- Complete dose assessment pathway analyses as described in DOE Order 5400.5.II.2,6, and 7; Radiological Effluent Monitoring and Environmental Surveillance Regulatory Guide for 10 CFR 834 (formerly Draft DOE Order 5400.xy.VIII [all sections]); and DOE/CH/8901 Sections 2.1-2.4, sufficient to support conclusions in the Annual Site Environmental Report (ASER) have not been performed and documented (I-R-6). For example, direct radiation measurements at property boundary locations 10, 5, and 4 are in excess of levels acceptable for continuous

exposure. Calculations or measurements supporting the statement that "homes on Central Avenue...would receive exposures equivalent to background" are not available (R-1). Because vicinity properties are privately owned, DOE Orders concerning dose assessments are the basis for best management practice findings with regard to the vicinity properties;

- The AIRDOS-PC (Version 3.0) computer program, first used this year to demonstrate compliance with 40 CFR 61 Subpart H, was not checked against a well-defined "benchmark problem" (I-R-11). As delineated in DOE Orders and ANSI/ANS-10.3-1986, this benchmark problem serves as a reference point to demonstrate proper functioning of the software within the computer system operating environment. AIRDOS-PC version 3.0 contains a "test case" which could serve as a minimal verification of proper functioning (R-27); and
- AIRDOS subpart H modeling was conducted only for the storage pile itself, not for the surrounding areas within the fenced property which are contaminated with radionuclides, and which also constitute a source more so during remedial activities, as defined in Subpart H (I-R-11). Additionally, input parameters are not documented in a manner which allows independent verification of assumptions used in the modeling as required by 40 CFR 61.95. For example, the storage pile, which is covered with seamed Hypalon, is modeled as 99 percent vegetated to mathematically represent low emission rates. Discussion of this assumption is not provided. A complete explanation of conversion factors used for source term inputs is also not provided (R-26).

Although calculated dose equivalents reported by the MISS are well below the 10-mrem/yr National Emission Standards for Hazardous Air Pollutants (NESHAP) limit, documentation of the program as it exists today does not meet the independent verification requirement in the EPA regulation and in DOE Order 5400.1.

This finding was not included in any DOE line management self-assessment, as none has been completed, nor were FUSRAP personnel aware of all aspects of it. An environmental assessment conducted by Oak Ridge National Laboratory (ORNL) identified that NESHAP dose assessments were not performed at MISS (R-25). Though these assessments have since been performed, deficiencies have been identified.

Causal factors include lack of procedures requiring specific quality assurance (QA) actions and documentation relating to dose assessments and failure to implement policy as represented by DOE Orders.

Tissue Equivalent Thermoluminescent Dosimeter
Program Deficiencies

Performance Objective: DOE Orders 5400.1, 5400.5, and 5400.xy stipulate that environmental monitoring data collected to determine compliance with applicable limits be documented in a manner capable of supporting conclusions and information reported in the ASER.

Finding: Although the original TETLD program for the MISS was thoroughly evaluated and upgraded following DOE's assignment to the site (I-R-8), the current program lacks formality required by DOE Orders. This may bring into question the validity of results and associated assessments of compliance. Noted deficiencies include the following:

- Although extensive evaluation of siting criteria and measurements of external penetrating radiation was performed to assess the adequacy of TETLD locations, this information was never compiled in a formal document which could serve as guidance for the program in future years. Much of this information is still available in various files and logbooks; however, it is not in a form that allows periodic review of current conditions and applicability to the original design. For example, background TETLD locations at the Rochelle Park Post Office and Fire Department are immediately adjacent to building materials, which may have affected monitoring results. Although this was recognized at the time of initial siting, measurements evaluating this potential problem were obtained and found to have no significant effect on projected use of results (I-R-8). However, this analysis is not formally documented and archived, and has not been transmitted as "lessons learned" to subsequent program element managers.
- TETLD spiking used for fade correction has recently been discontinued (I-R-6). Reportedly these corrections were running positive and negative, ultimately averaging out to make no significant difference in reported results. Discussions between Eberline and Bechtel National, Inc. (BNI) led to the decision to discontinue this practice. Formal documentation demonstrating that fade correction is not needed for TETLDs, which remain in the field for a year at a time, is not available. The spiking program seems to have had an added benefit in that it could assist in demonstrating the apparent high quality of the data obtained from the devices being used.
- An 8 percent correction factor is added to TETLD results to correct for attenuation of the polyvinyl chloride (PVC) canisters used to house and protect TETLDs while they remain in the field. Once again, extensive evaluation of these custom-designed canisters, which

appear to function quite nicely from a protection and security standpoint, was conducted but not formally documented.

See A/CF-1 for TETLD field data recording deficiencies.

This finding was not included in any DOE line management self-assessment, as none has been completed. FUSRAP personnel were unaware of the compliance aspects of this finding, and it was not included in audits or appraisals reviewed.

The causal factor appears to be failure to implement policy as represented by DOE Orders.

RAD/CF-3 Residual External Gamma Radiation Compliance Limit Discrepancies

Performance Objective: DOE Order 5400.5.IV.3.a specifies a basic public dose limit of 100 mrem/yr effective dose equivalent, followed by IV.3.b, which permits a dose limit greater than 100 mrem but not greater than 500 mrem in a year without approval from EH-1. Section IV.4c of that same Order states "The average level of gamma radiation inside a building or habitable structure on a site to be released without restrictions shall not exceed the background level by more than 20 μ R/hr..." This sentence goes on to say "...and shall comply with the basic dose limit when an 'appropriate-use' scenario is considered." This limit also applies to open lands. Section IV.2.c states, "The basis for the guidelines is generally a presumed worst-case plausible-use scenario for the property."

Finding: The gamma exposure rate limit of 20 μ R/hr (roughly 175 mrem/yr if continuous 24 hr/day exposure is assumed) above background stipulated in 5400.5.IV.4.c was published in site characterization reports without the "...shall comply with the basic dose limit..." portion of that requirement. This can exceed the current basic dose limit of 100 mrem/yr when the plausible-use guideline stipulated in 5400.5.IV.2.c is also invoked. The requirement in the Order and the published Maywood Site reports are thus subject to misinterpretation because they are based on an older limit stipulated in 40 CFR 192.12.

This finding was not included in any DOE line management self-assessment, as none has been completed. FUSRAP personnel were unaware of this finding, and it was not included in audits or appraisals reviewed.

Causal factors appear to include failure to completely assess risk associated with the 20 μ R/hr limit, and failure to reconcile change, as the limit dates to a period when accepted dose limits were higher.

Environmental "As Low As Reasonably Achievable"
(ALARA) Program Deficiencies

Performance Objective: DOE Order 5400.5, Section 6.b., Protecting the Environment, states, "In addition to providing protection to members of the public, it is DOE's objective to protect the environment from radioactive contamination to the extent practical." The Order also states in II.2.b, "Therefore,... qualitative analyses are acceptable, in most instances, for ALARA judgments, especially where potential doses are well below the dose limit (and) should be documented. More detailed analyses should be considered if the decisions might result in doses that approach the limit."

ALARA Program guidance is also found in DOE's "A Guide to Reducing Radiation Exposures to As Low As Reasonably Achievable (ALARA)" and "Health Physics Manual of Good Practices for Reducing Radiation Exposures to Levels that are As Low As Reasonably Achievable (ALARA)."

Finding: Environmental ALARA activities for site-specific operations other than the overall FUSRAP protocol (which is clearly based on the ALARA concept), are not documented and in at least one case, not implemented in accordance with site requirements (I-R-7).

With regard to surface contamination and control, the MISS portion of the Maywood Site has established a restricted-access control zone for areas that are contaminated with radionuclides. For the most part the restricted area is clearly delineated with rope and postings. One exception includes either side of the access road from the Stepan property to the reservoir on the fenced MISS site. Contaminated areas on both sides of the road are neither roped nor posted, and at the time of the Audit, the gate to the controlled area was open. While this gate would not allow members of the public access to the MISS, there is no means of controlling access through this gate and controlling the spread of contamination (from MISS to Stepan, Stepan to MISS, or MISS/Stepan to off-site), nor does it allow for recording on the log kept at the Eberline trailer who has entered the controlled area and whether or not they wore appropriate personal protective equipment and were monitored before leaving.

The finding was not included in any DOE line management self-assessment, as none has been completed. Many of these items were noted in a BNI Audit dated September 27, 1990 (for which corrective actions were already being developed) but which have not been corrected as of this writing.

Causal factors include lack of periodic review of site procedures and failure to implement barriers and controls as prescribed by DOE Orders.

Site Characterization and Remediation Reporting Deficiencies

Performance Objective: DOE Orders 5400.1, 5400.5.II.1, and Draft Order 5400.xy.VIII.2a require that dose assessments be conducted, evaluated, and reported in a manner capable of demonstrating compliance with applicable limits, including remedial actions (emphasis added). DOE/CH/8901, "A Manual for Implementing Residual Radioactive Material Guidelines," prescribes pathway analyses, soil concentration, and ALARA considerations to be employed.

Because vicinity properties are privately owned, DOE Orders are only compliance issues during actual remedial activities.

Finding: Site characterization and post-remedial action vicinity property reports do not discuss dose pathway analyses and exposure scenarios consistent with DOE remedial action requirements in a manner sufficient to support noted conclusions (I-R-10). Review of 9 out of approximately 70 site characterization reports and 2 post-remedial action reports revealed the following deficiencies (R-10 through 18 and R-19&20):

- Not all exposure pathways have been consistently evaluated. For example, radiological characterization for the property at 17 Redstone Lane (R-10) assumed exterior exposure in the yard where gamma radiation was measured between 10 and 14 $\mu\text{R/hr}$ (including 9 $\mu\text{R/hr}$ background), while this exposure scenario was not discussed at all for the property at 7 Branca Court (R-11) where gamma radiation of 26 $\mu\text{R/hr}$ was measured (9 $\mu\text{R/hr}$ background). Additionally, other pathways and their significance, such as ingestion of home-grown food, and inhalation of radionuclides potentially resuspended from mowing the lawn, etc., were not discussed.
- DOE Order 5400.5.IV.2.c states that the guideline for residual radioactive contamination "is generally a presumed worst-case plausible-use scenario for the property". Several of the site characterization reports assume only 16 hours of exposure in a home. It is reasonable to assume that some residents (infants, elderly, etc.) now, or in the future could spend 20-24 hrs/day at the property. Neither the residential site characterization plan nor the post-remedial action reports discuss what dose pathways were considered and subsequently reduced to those that were deemed significant; they merely report data for those evaluated (gamma radiation and radon monitoring).
- Post-remedial action reports for Lodi, Grove, and Parkway residential properties (R-19, R-20) subtract an annual background exposure rate of 100 mrem/yr from gamma exposure rates measured at remediated residences.

Measured background exposure rates of 9 μ R/hr (roughly 79 mrem/yr) are quoted in many of the site characterization reports. By subtracting 100 mrem from the overall gamma exposure rate for the property when actual measurements considered relevant for this area in New Jersey are roughly 79 mrem, the report underestimates the gamma dose resulting from residual radioactive materials by 21 mrem/yr (21 percent of the DOE basic dose limit) for each property.

This finding was not included in any DOE line management self-assessment, as none has been completed, and FUSRAP personnel were not fully aware of this finding. The finding was not included in any audit or appraisal reviewed.

Causal factors appear to include lack of procedures requiring specific QA actions and documentation and failure to implement policy as represented by DOE Orders.

RAD/BMPF-2 Radiation Background Recording Deficiencies

Performance Objective: Best Management Practice dictates that background measurements for radiation survey instrumentation be obtained and recorded in a consistent manner so measurements obtained may be properly interpreted. Forms used for recording field data should be completely filled out.

Finding: Background measurements obtained for data correction of walkover gamma scan and near-surface gamma radiation (cone-shielded) surveys are not consistently interpreted and recorded. Forms 3b.4a and 3b.2 are used to record data obtained in these surveys as specified in TMA/Eberline procedures 3B.4 (Walkover Gamma-Ray Scan) and 3B.2 (Near Surface Gamma-Ray Radiation Survey)(R-40). Each of these forms has an area to record "background". In some cases, no value is entered at all. In other cases, values obtained during instrument checks in the field office (within proximity to the pile and other contamination) are used (I-R-4). In still other cases, values obtained at the area being surveyed (which may also be affected by nearby contamination) are recorded. These observations indicate that a consistent basis for and understanding of the use of the background data do not exist. While the Audit Team understands that FUSRAP procedures call for soil sampling and analysis to be used for final unrestricted-release evaluations, direct-reading instrument measurements and data critical to their proper interpretation should be recorded on project documents in a clearly defined and uniform manner.

This finding was not included in any DOE line management self-assessment, as none has been completed. A BNI Audit form dated July 22, 1990 also noted background-data-recording deficiencies (R-24).

Causal factors appear to include failure to establish and implement consistent procedures.

3.7 Toxic Materials and Chemical Products Management

3.7.1 Overview

The Maywood Site does not manage or store any polychlorinated biphenyl (PCB) materials or restricted pesticide materials, nor does it store large quantities of process chemicals or petroleum products. Thus, the Toxic Substances Control Act (TSCA) (40 CFR 761); the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) (40 CFR 160); and portions of the Clean Water Act (CWA) relating to the storage of petroleum products (40 CFR 112 and 114) are not applicable to operations at the Maywood Site.

Asbestos-containing materials are present on the Maywood Site and their storage and management is regulated under the National Emission Standards for Hazardous Air Pollutants (NESHAP) (40 CFR 61). Sources of asbestos at the Maywood Interim Storage Site (MISS) include scrap process vessels and equipment which may have asbestos-containing insulation materials. An asbestos inventory has not been performed for the scrap materials, facilities, and equipment on the MISS nor has a characterization of potential asbestos-contaminated areas at the MISS been performed. A verbal agreement has been reached with the Stepan Company that any nonradioactive asbestos materials found at the MISS will be properly disposed of by Stepan (I-TCM-1).

The Toxic Materials and Chemical Products portion of the Audit identified one best management practice (BMP) finding. This finding deals with the lack of asbestos warning labels around areas of contamination, the lack of an adequate asbestos inventory, and the lack of a characterization of asbestos-contaminated areas at the Maywood Site.

3.7.2 Finding

TCM/BMPF-1 Inadequate Asbestos Labeling, Inventory, and Characterization of Potentially Contaminated Areas

Performance Objective: Best management practices for facilities contaminated with asbestos-containing materials include posting asbestos warning labels around areas of asbestos contamination, completion of a detailed asbestos site inventory, and characterization of additional areas on the site that are potentially contaminated with asbestos-containing materials.

Finding: Although a determination has been made that asbestos-containing materials are present at the MISS, asbestos warning labels have not been posted around areas of asbestos contamination, a detailed asbestos site inventory has not been performed, and characterization of additional potentially contaminated areas has not been performed.

During the Audit, a piece of scrap process equipment was identified as having friable asbestos-contaminated insulation. The equipment was promptly wrapped in plastic and appropriately labeled. Discussions with FUSRAP personnel indicated that the equipment had recently been moved from another location at the MISS onto the concrete pad where it currently is stored (I-A-10). Until the time of the Audit, the equipment was not covered with plastic, either at its former location or at its current location. The presence of friable asbestos on the equipment, combined with the lack of a protective cover, indicates that asbestos-containing materials may have contaminated the area where the equipment had formerly been stored. To preclude any further agitation or resuspension of asbestos-contaminated materials and to provide warning that the area may be contaminated, asbestos warning labels should be posted on the perimeter of the contaminated area, and additional areas contaminated with asbestos-containing materials should be characterized and controlled.

Discussions with Formerly Utilized Sites Remedial Action Program (FUSRAP) personnel indicated that a detailed asbestos site inventory to identify any further sources of friable asbestos had not been performed. Taking into account the age, past history of the site as a chemical manufacturing and processing site, and presence of asbestos-containing materials on scrap equipment, it is a reasonable assumption that additional asbestos may be present on-site.

FUSRAP personnel were aware of the asbestos-containing materials at the MISS but had taken no actions with regard to the other aspects of this finding.

The finding was not included in any DOE line management self-assessment, as none has been completed, nor was the finding included in any audit or appraisal conducted on environmental management activities at the Maywood Site.

The causal factors that led to the development of this finding appear to be incomplete inspections in that it was only recently determined that asbestos-containing materials are present at the MISS and inadequate procedures in that once the asbestos was confirmed, procedures and activities needed to limit the agitation and spread of asbestos were not in place.

3.8 Quality Assurance

3.8.1 Overview

The quality assurance (QA) Audit evaluated Maywood Site activities for the generation and validation of environmental monitoring data and assessed organizational effectiveness of Formerly Utilized Sites Remedial Action Program (FUSRAP) QA programs with regard to the management of environmental FUSRAP programs. The evaluation of QA practices was compared against regulatory requirements as listed in Table 3-7 and the data quality objectives for Maywood as derived from the U.S. Environmental Protection Agency (EPA) Region II Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) QA Manual as part of the Federal Facility Agreement (FFA).

The QA Program for FUSRAP resides in the Quality Assurance and Environmental Compliance (QA&EC) group at Bechtel National, Inc. (BNI), which functionally reports off-project to the QA Manager, Oak Ridge Office (BNI), but is dedicated to FUSRAP and has reporting responsibilities for project coordination with the FUSRAP Program Manager. QA&EC acts as a project-independent organization and sets QA policies, implements tier I program QA procedures, and conducts independent QA audit and surveillance activities. The document control activities are the responsibility of the FUSRAP Project Administration. U.S. Department of Energy (DOE), as the client organization, is linked to FUSRAP projects through the policies and procedures defined in the Management Requirements and Policies Manual. The QA responsibilities of DOE are surveillance of the program and the verification of conformance to DOE Orders and project requirements. The second tier of BNI QA for environmental activities resides in the Environmental, Health, and Safety Group, which implements and provides contractor oversight of field operations for FUSRAP. The final tier in the QA program is the implementation of environmental activities at New Jersey sites. All activities at this tier are not only guided by FUSRAP QA policies but must also comply with the EPA Region II CERCLA QA Manual.

All data generated in support of environmental programs and their validation are contracted to Roy F. Weston, Inc, and TMA/Eberline, Inc. The defensibility and the validity of these data are ensured through compliance with the requirements set forth in the EPA Region II CERCLA QA Manual. The contracting agreements and QA manuals for these companies were reviewed and found to adequately ensure data quality. In addition to reliance on contractor oversight of the data, BNI employs a rigorous verification procedure which checks all data for conformance to contract specifications. Annual audits of the contractor laboratories are performed with follow-up and verification of corrective actions. The weakness in this program is the lack of surveillance activities by DOE on BNI and TMA/Eberline field sampling operations.

TABLE 3-7
LIST OF APPLICABLE QUALITY ASSURANCE
REGULATIONS/REQUIREMENTS/GUIDELINES

<u>Regulations/ Requirements/ Guidelines</u>	<u>Section/Title</u>	<u>Authority</u>
DOE Order 5400.1	General Environmental Protection Program	DOE
DOE Order 5700.6B	Quality Assurance	DOE
DOE Order 5480.19	Conduct of Operations for DOE Facilities	DOE
DOE Order 5484.1	Environmental Protection, Safety, and Health Protection Information Reporting Requirements	DOE
CERCLA QA Manual	Region II CERCLA Quality Assurance Manual	EPA
EPA/QAMS-005/80	Handbook for Analytical Quality Control in Water and Wastewater Laboratories	EPA
EPA/QAMS-001/80	Strategy for the Implementation of the EPA's Mandatory Quality Assurance Program	EPA
NQA-1-1989	Quality Assurance Program Requirements for Nuclear Facilities	ANSI/ASME
FUSRAP Applicable Procedures	FUSRAP Manuals	BNI

The QA program for FUSRAP is defined in the Quality Assurance Program Plan (QAPP) and delineated in the policies, procedure manuals, and instruction guides generated for the conducting of FUSRAP. The QA program is highly detailed and complete in almost every aspect required by NQA-1. The BNI QA management systems are run effectively and have identified and corrected problems in a timely manner. However, the closeout of action plans by the FUSRAP project has been hampered by the failure of DOE to adequately review and sign off on these actions. The oversight activities conducted by BNI to ensure the effectiveness of environmental QA concerns have been effective; however, DOE surveillance activities on BNI have been absent. Concerns regarding the FUSRAP QA program involve completeness of the document control verification procedure and the absence of a formalized lessons-learned program.

The QA Audit identified four compliance findings that address the omission of QA data in the Annual Site Environmental Report (ASER), lack of lessons-learned program, no formal surveillance of environmental monitoring activities by DOE, and completeness in the document control verification procedure.

3.8.2 Findings

QA/CF-1 Lack of Quality Assurance Data in the Annual Site Environmental Reports

Performance Objective: DOE Order 5400.1, Chapter II requires that a summary of results from participation in QA cross-check programs be included in the ASER for all radiological and nonradiological environmental monitoring.

Finding: The 1985 to 1989 ASER did not contain QA/quality control (QC) results for all radiological and nonradiological environmental monitoring QA cross-check data collected.

The ASERs from 1985 to 1987 contained no summary of QA data results for radiological or nonradiological parameters. The 1988 and 1989 reports included the summary of radiological QA data; however, the nonradiological QA data were not presented, as required. New Jersey site FUSRAP personnel could not give any specific reason for these omissions (I-QA-9).

This finding was not contained in any former Maywood Site/FUSRAP audits or appraisals.

The probable root cause of this finding appears to be inadequate training of personnel responsible for production of the ASER that leads to a lack of DOE policy implementation. FUSRAP personnel were not aware of this reporting requirement.

QA/CF-2

Lack of a Formal Lessons-Learned Program

Performance Objective: Chapter VI of DOE Order 5480.19 states that the lessons learned from an investigation be shared with all appropriate personnel who could benefit from the lessons learned.

Finding: There is no formally defined lessons-learned program within the FUSRAP project.

The FUSRAP project conducts a number of activities that communicate information from audit and appraisal activities, such as: Project Quality Assurance Reports; weekly managers' meetings; changes in procedures and guidelines resulting from findings; and occasional memoranda from project managers alerting others to site problems encountered. However, there is no formally defined program for the transfer of lessons learned from events to all appropriate FUSRAP personnel who may benefit from source information (e.g., audit findings).

Many of the mechanisms mentioned above pass on information derived from lessons-learned information; however, this information is filtered and thus inadvertently results in precluding access of some FUSRAP personnel to source information. The lessons-learned activity would initiate wider dissemination of source information to pertinent FUSRAP project members and permit increased input to corrective action activities.

DOE-Oak Ridge Operations Office (OR) Former Site Remediation Division (FSRD) has recognized the need for formalized lessons-learned activities in FUSRAP and has recently sent a letter to the BNI Program Manager (QA-30) communicating the need to establish a lessons-learned program.

This finding was not identified in the recently conducted Functional Appraisal (QA-10) or the BNI ESH and QA Audit (QA-12). It therefore appears that there has been a deficiency in reviews/appraisals/audits in identifying the need for this formality in the conduct of FUSRAP operations.

QA/CF-3

Lack of Formal Surveillance Activities on FUSRAP by DOE

Performance Objective: DOE Orders 5400.1 and 5700.6B and NQA-1 require that formal surveillance activities by line management be performed on all activities to verify conformity to requirements. The FUSRAP Management Requirements and Policy Manual (MRPM) states that DOE site managers are responsible for conducting regular surveillance of site activities at their assigned sites. These surveillance activities must be documented in reports, and if noncompliances are identified, corrective actions must be initiated.

Finding: DOE-OR does not conduct formal surveillance activities on FUSRAP operations conducted by BNI, as required by DOE Orders and the MRPM.

Interviews with DOE personnel from FSRD and ESH&QA indicated that no formal surveillances have been conducted by DOE on FUSRAP activities conducted by BNI (I-QA-2, I-QA-4, I-QA-9). FSRD site managers have not conducted any surveillance activities on site operations and instead rely solely on BNI to verify conformity to required procedures and guidelines by its personnel and the subcontractor TMA/Eberline sampling personnel. However, BNI site personnel do not oversee the activities of TMA/Eberline (I-QA-8) and have just recently formalized field surveillance activities which presently operate under draft procedures (I-QA-5).

The Environmental Protection and Environmental Restoration Divisions of DOE-OR ESH&QA have not conducted any surveillances on the FUSRAP due to inadequate personnel resources and competing priorities (I-QA-4). The Quality Assurance and Reliability Division (QA&RD) states that its personnel work closely with the FUSRAP QA&EC personnel and it has done approximately 10 surveillances on the FUSRAP QA program in the past 18 months. However, no surveillance reports have been generated, no formal corrective actions have been initiated in response to recognized nonconformances, and no documentation of the surveillances has been kept. In addition, the QA&RD has set no schedules for further oversight of the QA program (I-QA-2).

DOE personnel do initiate and conduct functional appraisals of the FUSRAP on a biannual basis; however, this does not adequately capture nonconforming on-site activities in a timely manner for prompt corrective action.

FUSRAP personnel were aware of this deficiency; however, this finding was not included in any audit or appraisal reviewed. In addition, this finding has not been included in self-assessments by DOE line management, as none has been initiated.

The apparent causes of this finding are inadequacies in conducting audits and appraisals and a lack of personnel resources available to oversee FUSRAP activities.

QA/CF-4

Deficiencies Exist in the Control of FUSRAP Documents

Performance Objective: NQA-1 requires that the document control system provide for the identification and maintenance of documents, along with their specified distribution. In keeping with this requirement, FUSRAP Project Administrative Services Procedure 2.21 requires ensuring that each control distribution list remains current and minimal.

Finding: The FUSRAP document control procedures lack the step necessary to ensure that each distribution list remains current and minimal.

The FUSRAP document control procedures address NQA-1 requirements to maintain the proper documents and their most recent revisions at designated distribution points. This is accomplished by sending monthly document registers, which contain the latest listing of documents released to that site, with a cover memorandum requesting verification and/or correction of current document status. This procedure would be adequate to ensure that each distribution list remains current and minimal, except that there is no checkpoint to ensure that all verification letters are returned to the document control clerk. As a result, the verification loop is not closed and insufficient and/or excessive documentation may be located at the site or outdated documents may be employed.

FUSRAP personnel were not aware of this finding and it was not included in any audit or appraisal reviewed. In addition, this finding was not included in any DOE line management self-assessment, as none has been conducted.

The apparent causes of this finding are inadequate procedures and reviews, in that need for this procedural step was known but the omission was not previously identified and corrected.

3.9 Inactive Waste Sites

3.9.1 Overview

The purpose of the inactive waste sites portion of the Environmental Audit of the Maywood Site is to evaluate 1) the management and conduct of studies to respond to cleanup of the Maywood Interim Storage Site (MISS) and associated vicinity properties; and 2) compliance with Federal, state, and U.S. Department of Energy (DOE) requirements concerning cleanup activities at the site, such as the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), DOE Order 5400.4, and the Maywood Site Federal Facility Agreement (FFA).

The Maywood Site is comprised of the MISS and various vicinity properties, including the Stepan Company property (former Maywood Chemical Works property) and numerous residential, commercial, Federal, state, and municipal properties in Maywood, Rochelle Park, and Lodi, New Jersey as described in Section 1.4, Description of Facility. The MISS is a temporary storage site on the northern corner of property once owned by the Stepan Company. The MISS is the only property of the Maywood Site that is owned by DOE and the only one over which the Department has direct control. Excavated soils from several decontaminated properties are currently stored on the MISS pending a decision on their final disposition.

In December 1982, the U.S. Environmental Protection Agency (EPA) proposed to include the Maywood Site on its National Priorities List (NPL), and this listing officially occurred on September 8, 1983 (the site is designated as the "Maywood Chemical Company Site" on the NPL). DOE was authorized by the Energy and Water Appropriations Act of 1984 to undertake a decontamination research and development project at the Maywood Site, and the site was assigned by DOE to the Formerly Utilized Sites Remedial Action Program (FUSRAP) at that time. In 1985, in order to expedite cleanup of the vicinity properties, Stepan Company transferred ownership of the property which is now the MISS to DOE. Subsequently, DOE began a program of removal actions at the vicinity properties under FUSRAP, stockpiled the removed materials at the MISS, and began a program of environmental monitoring at the MISS.

Current responsibility for cleanup of radioactive and chemical contamination identified at the Maywood Site is divided between DOE and EPA Region II. This partitioning is based upon DOE's assigned responsibility under FUSRAP and statutory responsibilities under CERCLA, EPA's statutory responsibilities, and a negotiated FFA between DOE and EPA Region II. Negotiations on the FFA were

completed in December 1989, and the document was signed by both parties by September 1990. The FFA is currently in the public review process. The general purpose and intent of the FFA is to:

- Ensure that the environmental impacts associated with past and present activities at the Maywood Site are thoroughly investigated and appropriate remedial action taken as necessary to protect public health or welfare and the environment;
- Establish a procedural framework and schedule for developing, implementing, and monitoring appropriate response actions at the site in accordance with CERCLA, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), and Superfund guidance and policy;
- Evaluate all past investigative and response actions taken at the site by DOE and all related documentation to determine whether they are the functional equivalent of, and consistent with, the actions and documentation required by CERCLA, the NCP, and Superfund guidance and policy;
- Facilitate cooperation, exchange of information, and participation of the parties in such actions; and
- Ensure that removal and remedial actions at the site will be in compliance with Federal and state Applicable, or Relevant and Appropriate Requirements (ARARs).

In addition, specific elements of the agreement are incorporated to meet the requirements of CERCLA including:

- Establishing requirements for the performance of a Remedial Investigation (RI) to determine fully the nature and extent of the threat to public health or welfare and the environment caused by the release or threatened release of FUSRAP waste at the site;
- Establishing requirements for the performance of a Feasibility Study (FS) to identify, evaluate, and select alternatives for the appropriate remedial action(s) to prevent, mitigate, or abate the release or threatened release of FUSRAP waste at the site in accordance with CERCLA; and
- Identifying the nature, objectives, and schedule of response actions to be taken at the site. Response actions at the site shall attain that degree of cleanup of hazardous substances, pollutants, or contaminants mandated by CERCLA.

As defined in the FFA, "FUSRAP waste" is specifically limited to:

- All radioactive and chemical contamination, whether commingled or not, occurring on the MISS;

- All radioactive contamination above DOE action levels occurring on any vicinity property that is related to past thorium processing at the Maywood Chemical Works site; and
- Chemical contamination that is mixed or commingled with radioactive contamination above DOE action levels at a vicinity property, or chemical contamination at a vicinity property that originated at the MISS or was associated with specific thorium manufacturing or processing activities at the Maywood Chemical Works site.

It should be noted that two additional CERCLA investigations are taking place in the vicinity of the Maywood Site. The first is being conducted by EPA Region II under a CERCLA Section 106 enforcement action. This investigation focuses on chemical contamination at the Stepan Company property. DOE and the Stepan Company have signed a cooperative agreement to define their respective roles and responsibilities. Coordination with the Stepan Company RI/FS process is essential to accomplish complete, cost-effective investigation and appropriate remediation at both sites. The EPA is also performing a CERCLA investigation at the municipal well field in Lodi. Coordination with DOE is expected to involve at least an exchange of groundwater monitoring information.

Current remedial actions conducted by DOE at the Maywood Site under the NCP include the initiation of an RI/FS. At the time of the Audit, DOE has completed approximately 70 percent of the field investigation phase of the RI. The RI is being performed to collect the information and data necessary to perform the FS and select appropriate remedial action for the site. In addition, all DOE activities must be conducted in compliance with the National Environmental Policy Act (NEPA), which requires that the environmental consequences of a proposed remedial action be considered part of the decision-making process for that action. It is DOE policy to integrate the requirements of the CERCLA and NEPA processes for remedial actions at sites for which it has responsibility. Therefore, DOE is conducting an RI/FS-Environmental Impact Statement (EIS) process for environmental compliance at the Maywood Site. Under this process, DOE has followed the RI/FS process specified in the NCP for environmental compliance under CERCLA, and it will add to that process those elements required to satisfy the EIS process under NEPA.

The general approach to the inactive waste sites Environmental Audit included interviews with FUSRAP and regulatory agency (EPA and New Jersey Department of Environmental Protection [NJDEP]) personnel, review of project CERCLA-related documents, and on-site verification. The information collected from these activities was evaluated with respect to Federal and state regulations and DOE Orders, as identified in Table 3-8.

TABLE 3-8
LIST OF APPLICABLE INACTIVE WASTE SITES
REGULATIONS/REQUIREMENTS/GUIDELINES

<u>Regulations/ Requirements/ Guidelines</u>	<u>Section/Title</u>	<u>Authority</u>
Public Law 96-510	Comprehensive Environmental Response, Compensation, and Liability Act, as amended	EPA
Public Law 99-499	Superfund Amendments and Reauthorization Act of 1986	EPA
40 CFR 300	National Oil and Hazardous Substances Pollution Contingency Plan	EPA
40 CFR 302	Designation, Reportable Quantities, and Notification	EPA
40 CFR 355	Emergency Planning and Notification	EPA
40 CFR 370	Hazardous Chemical Reporting: Community Right-to-Know	EPA
DOE Order 5400.1	General Environmental Protection Program	DOE
DOE Order 5400.4	Comprehensive Environmental Response, Compensation, and Liability Act Requirements	DOE
DOE Order 5400.2A	Environmental Compliance Issue Coordination	DOE
DOE Order 5482.1B	Environment, Safety, and Health Appraisal Program	DOE
DOE Order 5484.1	Environmental Protection, Safety, and Health Protection Information Reporting Requirements	DOE
Federal Facility Agreement under CERCLA 120	U.S. EPA Region II and DOE Federal Facility Agreement	EPA/DOE

TABLE 3-8 (Continued)
LIST OF APPLICABLE INACTIVE WASTE SITES
REGULATIONS/REQUIREMENTS/GUIDELINES

<u>Regulations/ Requirements/ Guidelines</u>	<u>Section/Title</u>	<u>Authority</u>
43 CFR 11	National Resource Damage Assessments	DOI
NJAC Title 7, Chapter 26B	Environmental Cleanup Responsibility Act Rules	NJDEP
29 CFR 1910.120	Environmental Safety and Health Aspects of Hazardous Waste Site Operations	OSHA

Overall, FUSRAP personnel have taken positive steps toward implementing a CERCLA compliance program at the Maywood Site, and in most cases, this program has served as a model for meeting the schedule and performing the activities necessary to satisfy the requirements of an integrated CERCLA-NEPA process. Three compliance findings were identified during the Audit. The compliance findings deal with inadequate implementation of the NCP and DOE Order 5400.4.

3.9.2 Findings

IWS/CF-1 Administrative Record for Selection of Response Action

Performance Objective: DOE Order 5400.4, CERCLA Requirements, states that DOE shall respond to releases of hazardous substances at facilities under DOE jurisdiction in accordance with the provisions of CERCLA, as amended, as well as the NCP and Executive Order 12580, including both removal and remedial actions, as appropriate. SARA established the requirement for an administrative record in order to allow public participation in the selection of remedial alternatives. The NCP, as amended (effective April 1990), states: "The administrative record file for the selection of a remedial action shall be made available for public inspection at the commencement of the remedial investigation phase. At such time, the lead agency shall publish in a major local newspaper of general circulation a notice of the availability of the administrative record file" (40 CFR 300.815). The NCP further states in §300.810 that the administrative record file for selection of a response action shall include an index of the documents in the administrative record file.

Finding: The Maywood Site Information Repository at the Maywood Public Library has not been maintained to meet the NCP requirements for the establishment of an Administrative Record.

Interviews with DOE and Bechtel National, Inc. (BNI) personnel and review of the Information Repository located at the Maywood Public Library indicate that the requirements of the NCP have not been implemented concerning the establishment of the Administrative Record for the Maywood Site (I-IWS-18, I-IWS-12). The following are specific examples noted following a review of the Information Repository:

- The repository has not been maintained or updated within the past year. Numerous technical documents are in the repository, including radiation survey reports, remedial action plans, post-remedial action reports in support of the 1988 compliance docket for previous remedial actions, FUSRAP planning documents, RI/FS-EIS scoping documents, and the recently negotiated FFA. These documents were not organized in a logical manner, and no documents were labeled as the official Administrative Record for the site. In addition,

Stepan Company RI/FS documents were included with the Maywood Site Information Repository.

- No index of the documents included as the Administrative Record file or document describing the purpose and organization of the Administrative Record for the site was available.
- No notice of the availability of the Administrative Record for the response action at the site for publication in a major local newspaper of general circulation was evident.
- The primary local contact for management of the Information Repository, the Maywood Public Library Director, was not knowledgeable about or informed on the purpose of the repository or the effort required to establish and manage the Administrative Record.

This finding was not included in any DOE line management self-assessment, as none has been completed. FUSRAP personnel are aware of this deficiency, as they mentioned several times their intention to update the Administrative Record for the site (I-IWS-3, I-IWS-23). This finding was not identified in any previous BNI audits or appraisals identified during the Audit.

The apparent causal factor for this finding is inadequate procedures to implement the requirements of the NCP. There is a lack of training on the existence, importance, and applicability of the Administrative Record.

IWS/CF-2 Community Relations in Support of the RI/FS-EIS Process

Performance Objective: DOE Order 5400.4, CERCLA Requirements, states that DOE shall respond to releases of hazardous substances at facilities under DOE jurisdiction in accordance with the provisions of CERCLA, as amended, as well as the NCP and Executive Order 12580, including both removal and remedial actions, as appropriate. The SARA of 1986 established the requirement for community relations and an Administrative Record in order to allow public participation in the selection of remedial alternatives. The NCP, as amended (effective April 1990), states in §300.430(c) that the lead agency shall provide for the following community relations activities to be undertaken prior to commencing fieldwork for the RI:

- Preparing a formal Community Relations Plan (CRP) that ensures the public has appropriate opportunities for involvement in a wide variety of site-related decisions, including site analysis and characterization, and providing appropriate opportunities for the community to learn about the site.

- Establishing at least one local information repository at or near the location of the response action that contains a copy of the items made available to the public, including information that describes the technical assistance grants application process.
- Informing the community of the availability of technical assistance grants.

Requirements in the CRP for the RI/FS-EIS for the Maywood Site (June 1990) include the following community relations activities prior to initiation of the RI:

- Preparing a fact sheet providing general information about the CERCLA/NEPA process.
- Holding a public meeting to describe the CERCLA/NEPA process.
- Holding a scoping meeting relative to the RI/FS-EIS process.

Finding: The community relations activities conducted at the Maywood Site in support of the RI/FS-EIS process are not in compliance with the NCP and the CRP prepared for the site RI/FS-EIS activities.

The Maywood Site RI field investigation activities were initiated by BNI in September 1990, and at the time of this Audit they are approximately 70 percent complete. A public meeting is scheduled for December 1990 to serve as the descriptive meeting on the CERCLA/NEPA process, as the scoping meeting of the RI/FS-EIS activity, and as the Notice of Intent (NOI) to perform an EIS. The current schedule to complete the RI field investigation activities is early December 1990. Strictly speaking, field activities should not have been initiated until the required public review period was held and formal finalization and approvals of the RI/FS-EIS scoping documents were obtained. The fact that the field investigation activities will essentially be complete prior to the scheduled, required community relations activities specified in the CRP prepared for the Maywood Site RI/FS-EIS has meant that community relations requirements have not been met:

- The public has not been provided with the opportunity to participate in the RI/FS-EIS scoping process owing both to the lack of a fact sheet describing the CERCLA/NEPA process and to the absence of a public meeting to describe the process and scope of the RI/FS-EIS.
- Due to the delay in the public comment and review period, remedial investigation activities at the site were initiated and continue to be performed even though not all the RI/FS planning documents have been finalized, signed, or published. DOE is committed to incorporate public concerns and comment into the RI program, if required, to complete the RI.

- Because there have been no public meetings, the community has not been informed of the availability of technical assistance grants. In addition, no information describing the technical assistance grant application process to the public was evident in the Information Repository for the site.

Interviews with DOE and BNI FUSRAP personnel revealed that the public meetings to support the RI/FS-EIS activities were originally scheduled for September 1990, the date field investigation activities began. The meetings were subsequently postponed due to the time required for review and approval of the project's NOI at DOE Headquarters. In fact, at the time of the Audit, the final approval of the NOI from Headquarters was still pending. Once the RI/FS-EIS scoping documents are approved and printed in the Federal Register, the public will have 30 days to review them. This public review period could lead to substantial delays and cost impacts to the project, should there be significant public concern and comment.

This finding was not included in any DOE line management self-assessment, as none has been completed. FUSRAP personnel were aware of this deficiency at the time of the Audit, as concurrence was obtained from DOE by BNI to initiate RI activities at the site even though not all planning documents were finalized and published. This finding was not identified in any previous BNI audits or appraisals identified during the Audit.

The apparent causal factor for this finding is inadequate policy implementation of DOE Order 5400.4 and the CRP for the RI/FS-EIS for the Maywood Site. Additionally, there is a lack of knowledgeable supervision, resulting in a disregard for NCP and CRP requirements during the DOE Headquarters review process.

IWS/CF-3

Natural Resource Trustee Responsibilities

Performance Objective: DOE Order 5400.4, CERCLA Requirements, states that DOE shall respond to releases of hazardous substances at facilities under DOE jurisdiction in accordance with the provisions of CERCLA, as amended, as well as the NCP and Executive Order 12580, including both removal and remedial actions, as appropriate. NCP §300.135(j) provides the general response action procedure for a lead agency to promptly notify natural resource trustees of threats or potential threats to their trust resources from releases that are under investigation. The NCP specifies further notification requirements for the lead agency during removal actions or remedial actions. Specifically, NCP §300.410(g) states "If natural resources are or may be injured by the release, the lead agency shall ensure that state and Federal trustees of the affected natural resources are promptly notified in order that the trustees may initiate appropriate actions, including those identified in Subpart G, Trustees for Natural Resources, of this Part. The lead agency shall seek to coordinate necessary

assessments, evaluations, investigations, and planning with such state and Federal trustees."

Finding: DOE has not conducted the natural resource trustee notifications and coordination required by a lead agency while performing the Maywood Site RI/FS-EIS under the NCP.

The NCP requires that DOE, when responding to a release of hazardous substances or a threat of a release, notify any cognizant natural resource trustees of potential injuries to their trust resources, even if DOE may itself be a natural resource trustee for some of the potentially affected resources. Because discharges or releases from the Maywood Site may affect natural resources off-site or those on-site which are not solely under DOE's trust jurisdiction (i.e., groundwater), the DOE FUSRAP personnel charged with overseeing environmental restoration activity at the site should also oversee the identification of the applicable natural resources and appropriate Federal and state trustees. Contact with the NJDEP indicates that the state considers itself a co-trustee for the groundwater resource (I-IWS-36). As per DOE Order 5400.4, Heads of Field Organizations are responsible for notifying the co-trustees.

The NCP broadens the requirement for notification of trustees to include anytime that data indicate that natural resources will be threatened. Coordination with co-trustees thus becomes proactive on the part of DOE throughout the RI/FS-EIS process, and may be taken to include the same activities and notification requirements previously described.

Interviews with DOE FUSRAP personnel revealed that DOE did consider the issue of natural resource trustee responsibilities during the FFA negotiations and determined that the extent of natural resources and the extent of FUSRAP waste at the site were essentially the same (I-IWS-23). However, no official notification was made to cognizant natural resource trustees. The only resource identified by DOE for the site is groundwater, and the only trustee identified for this resource is DOE itself. Because the State of New Jersey did not participate in the FFA negotiations, official notification of the state as a natural resource trustee is important when considering the potential for the storage of FUSRAP wastes at the site for prolonged periods.

This finding was not included in any DOE line management self-assessment, as none has been completed. FUSRAP personnel were aware of this deficiency at the time of the Audit, as this issue was addressed internally by DOE during the FFA negotiations. This finding was not identified in any previous BNI audits or appraisals identified during the Audit.

The apparent causal factor for this finding is inadequate procedures to implement the requirements of the NCP.

3.10 Management

3.10.1 Overview

The management and organization assessment evaluated the effectiveness and identified the strengths and weaknesses in the U.S. Department of Energy-Oak Ridge Operations Office (DOE-OR) and Bechtel National, Inc. (BNI) management of environmental programs as they relate to the Maywood Site Environmental Audit.

The assessment was largely conducted through the use of interviews and document review. The personnel interviewed ranged from senior DOE and BNI program management personnel to project-level management personnel and line supervisors.

The Formerly Utilized Sites Remedial Action Program (FUSRAP) is one of four DOE programs to evaluate and remedy radiological conditions at a number of privately, institutionally, and DOE-owned sites with the key objective of protecting public health and safety.

Several organizations are responsible for FUSRAP project activities. DOE is responsible for the overall implementation of FUSRAP, with DOE Headquarters providing oversight and coordination. Under contract to DOE Headquarters, Oak Ridge Associated Universities (ORAU) and Oak Ridge National Laboratory (ORNL) perform initial investigations of potential FUSRAP sites. Based on the results of the investigations, DOE Headquarters designates sites and properties into FUSRAP. ORAU and ORNL also provide independent verification that remedial action is complete. DOE Headquarters then certifies that the sites can be released for future use.

DOE-OR's Former Sites Remediation Division (FSRD) manages day-to-day FUSRAP activities, and the BNI FUSRAP Project serves as the project management contractor. Argonne National Laboratory serves in an independent role as the environmental compliance contractor. Figure 3-1 shows the DOE management organization structure.

As project management contractor for FUSRAP, the BNI project provides environmental protection, safety and health, and quality assurance (QA) support services to DOE, and implements a QA program per ASME NQA-1 (and DOE Order 5700.6B/ORO Supplement). Typically these activities include:

- Site maintenance and security.
- Community relations.
- Plans preparation (i.e., QA, work, safety and health, field sampling, and community relations).
- Development and procurement of subcontracting services.

FIGURE 3-1 DOE MANAGEMENT ORGANIZATION (FUSRAP)

- Collection and review of data, including sampling results.
- Quality assurance/quality control (QA/QC) submittals and sample tracking custody.
- Technical guidance to on-site personnel.
- Report preparation.
- Cost management and schedule control.
- Environment, safety and health (ES&H), and QA audits.

The BNI program manager is responsible to DOE for the successful completion of all aspects of the work. The program manager is supported by project managers and representatives of the QA, engineering, construction, ES&H, procurement, operations, project administration/records control, and community relations organization. Specific responsibilities of these groups are contained in the plans and procedures prepared by the project to control the work. Figure 3-2 shows the BNI management organization structure.

The management review of the FUSRAP program included an analysis of the DOE-OR line management self-assessment program for the FUSRAP sites. The analysis of the line management self-assessment program is based on a directive of January 26, 1990, to Secretarial and Operations Office Managers by Secretary Watkins requiring all line management organizations to institute a formalized self-assessment program, and on detailed self-assessment guidance issued by Secretary Watkins on July 31, 1990.

Formal environmental assessments of the FUSRAP projects are conducted by persons who are not under the jurisdiction of the DOE-OR Assistant Manager for Environmental Restoration and Waste Management (AM/ERWM), which is the DOE line management organization (I-ATL-5). BNI-Oak Ridge and the BNI QA function conduct annual appraisals of the FUSRAP program using only off-line employees (those not assigned to the FUSRAP project being assessed). The latest BNI appraisal was published on November 1, 1990 (MGT-4). Additionally, BNI has recently established a formal surveillance program for FUSRAP projects.

The FUSRAP program is subject to independent audits and appraisals conducted by the DOE-OR Assistant Manager for Environment, Safety and Quality (AM/ES&Q) and through an independent contractor. Two independent appraisals have been conducted over the last year (MGT-3, MGT-5). No routine formal surveillances are conducted by any DOE-OR office; this function is totally left to BNI.

FUSRAP PROJECT ORGANIZATION

11/80

* SEE SITE RESPONSIBILITIES LIST FOR ASSIGNED PERSONNEL FOR EACH SITE
† PART TIME

△ REPORTS TO GALE HOVEY
▼ REPORTS TO DICK HARBERT

— PROJECT DIRECTION
- - - PROJECT COORDINATION
○ CURRENT HEADCOUNT

FIGURE 3-2 BECHTEL MANAGEMENT ORGANIZATION (FUSRAP)

Within the AM/ERWM, FSRD is the line management organization responsible for the FUSRAP Project. FSRD conducts routine oversight of BNI FUSRAP activities through site visits, biweekly management meetings, reviews of environmental compliance and monitoring reports, and an annual contractor performance appraisal per DOE-OR Order 13xx.1c (MGT-1). FSRD and BNI are currently completing a formal procedure for BNI environmental assessments, audits, and surveillances (MGT-7).

An evaluation of FUSRAP's compliance with Secretary of Energy Notice (SEN)-7 was also conducted. SEN-7 directs that field offices perform a monthly compliance review and prepare a monthly (now required quarterly by SEN-7A) report on the status of the line organization's compliance with all environmental regulations. Subsequent guidance was issued by Secretary Watkins and the Assistant Secretary for Environment, Safety and Health (EH-1) on August 21, 1989 and January 31, 1990. FUSRAP SEN-7 reports are prepared by FSRD and generally submitted to DOE Headquarters on a schedule specified by SEN-7.

The Audit team has reached the following conclusions:

- All of the DOE and BNI managers interviewed appear committed to and supportive of ES&H compliance requirements associated with the FUSRAP program.
- Based on DOE summary performance appraisals of BNI and the above-referenced interviews, communication between DOE-OR and BNI managers and staff appears to be very good.
- BNI corporate and site managers have demonstrated their full support of the Commitment to Continuous Improvement (CCI).
- Changes to budgetary allocations for the FUSRAP program have caused major perturbations in BNI staff requirements.
- The length of this program has afforded DOE and BNI the opportunity to rotate many employees through the FUSRAP process. A positive aspect of this practice is that the rotation process should keep employees alert and committed, thereby eliminating or reducing burnout behavior. However, institutional memory will be lost unless a formal lessons-learned program is instituted, a good documentation retrieval system is in place, and a dynamic training program is established to ensure compliance with DOE Orders and project requirements.

The evaluation of the DOE-OR line management self-assessment program revealed that it does not comply with substantive requirements in the ES&H self-assessment guidance. No formal self-

assessment program for the AM/ERWM has been developed. FSRD has independently developed a formal self-assessment program which meets many of the requirements specified by the ES&H self-assessment guidance (MGT-1). However, in part due to the absence of a top-tier self-assessment program for the AM/ERWM, deficiencies in the FUSRAP self-assessment program exist (see MGT/CF-3 for specific deficiencies). The major deficiency is the lack of functional and management appraisals of the FUSRAP Project Contractor (BNI) by DCE line management.

With regard to SEN-7 reporting, the Audit Team determined that SEN-7 reports submitted by FUSRAP are incomplete and not prepared in accordance with SEN-7 and guidance issued by DOE Headquarters. FUSRAP SEN-7 reports do not contain sufficient detail on environmental compliance issues as required by SEN-7 and subsequent guidance. With few exceptions, FUSRAP SEN-7 reports are vague and generally communicate compliance issues only in statistical summary form. Senior line management (DOE-OR and DOE Headquarters) is not being informed by FUSRAP SEN-7 reports of significant environmental compliance deficiencies. The Audit team identified 11 compliance-related findings, associated with environmental regulations and DOE Orders, of which FUSRAP personnel were aware or partially aware but which do not appear in FUSRAP SEN-7 reports (other than in statistical summaries) (MGT-30). Specifically, the September 1990 FUSRAP SEN-7 report did not include a discussion of noncompliance with regard to required CERCLA community relations activities which resulted from DOE Headquarters delays in approving the Notice of Intent (NOI) (refer to Finding IWS/CF-2). Additionally, the FUSRAP SEN-7 reports do not include deficiencies relating to compliance with DOE Orders.

The DOE-FUSRAP contract does not contain an award fee provision for financial incentive to encourage contractor excellence in ES&H; however, the biannual appraisal of BNI does provide a mechanism for DOE to communicate its expectations. A review of this process for the past 3 years (MGT-25, 26, 28, 29) indicates that DOE has consistently given BNI an excellent evaluation in this area.

3.10.2 Findings

MGT/CF-1 Failure to Prepare Environmental Protection Plans As Required by DOE Order 5400.1

Performance Objective: DOE Order 5400.1 Chapter III requires each Head of Field Organization to prepare a Waste Minimization Program Plan and a Groundwater Protection Management Plan by May 9, 1990, as well as a Pollution Prevention Awareness Program Plan by November 9, 1989.

Finding: The FUSRAP has not prepared a Waste Minimization Program Plan, a Groundwater Protection Management Plan, or a Pollution Prevention Awareness Plan.

Waste Minimization Program Plan

Section 4.2 of the FUSRAP Environmental Protection Program Implementation Plan (EPPIP) dated November 13, 1989 (which the FUSRAP prepared in accordance with DOE Order 5400.1) states that "The Project Management Contractor (BNI) will prepare such a plan and submit it to TSD (now the DOE Former Sites Remediation Program) and the EPD (the DOE-OR Environmental Protection Division) for review and concurrence." At the time of the Environmental Audit, the plan had not been prepared.

Pollution Prevention Awareness Plan

Section 4.3 of the EPPIP states that "...it is most practical to combine the pollution prevention awareness program with the waste minimization plan." Since no Waste Minimization Program Plan has been prepared, no Pollution Prevention Awareness Plan exists. Further, since the Pollution Prevention Awareness Plan was due November 9, 1989, and the waste minimization plan was not due until May 9, 1990, the EPPIP was inconsistent with DOE Order 5400.1 when it was approved on February 26, 1990 (TL-2).

Groundwater Protection Management Program Plan

Section 4.1 of the EPPIP states: "Specific guidance for the groundwater protection management program is being developed by DOE. The program will be developed and implemented by the EH&S Department of the PMC (BNI) as soon as guidance becomes available." The plan had not been developed at the time of this Environmental Audit.

Interviews with BNI personnel (I-TL-1) indicate that a draft Waste Minimization Program Plan and Groundwater Protection Management Program Plan were prepared but were removed from the FUSRAP EPPIP at the direction of the DOE FSRD.

Chapter I, Section 4 of Order 5400.1 sets out exemption procedures which require that heads of field organizations or program senior officials are to submit to the Assistant Secretary for Environment, Safety and Health a request for temporary or permanent exemption from DOE standards. No such request for exemption from plan preparation requirements has been submitted for FUSRAP (I-TL-2).

BNI has prepared a draft update of the EPPIP, dated November 1990. Section 4.0 of the revised EPPIP states that the referenced plans will not be prepared, and provides a rationale. However, the rationale is not based on any granted exemption, as is required by the DOE Order.

BNI was aware these plans did not exist but was not aware of the lack of an exemption request. The DOE management organizations for FUSRAP were aware of the lack of the plans but were not aware of

the requirement to apply for an exemption. This finding did not appear in any audit, self-assessment, or appraisal.

The apparent causes of this finding are failure to implement policy in terms of formal planning to prevent pollution and minimize waste.

MGT/CF-2 Inadequate SEN-7 Reports

Performance Objective: SEN-7 directs that field offices perform a monthly compliance review and prepare a monthly (now required quarterly by SEN-7A) report on the status of the line organization's compliance with all environmental regulations. Guidance issued on August 21, 1989 by Secretary Watkins and the Assistant Secretary for Environment, Safety and Health (EH-1), included the requirement that SEN-7 reports be comprehensive and include compliance with DOE Orders. Additional Guidance issued on January 31, 1990 by EH-1 required that SEN-7 reports include a concise executive summary that highlights major compliance issues, and that they include an evaluation of maintenance and operations (M&O) contractor performance.

Finding: SEN-7 reports submitted by FUSRAP are incomplete and not prepared in accordance with SEN-7 and guidance issued by DOE Headquarters.

FUSRAP SEN-7 reports do not contain sufficient detail on environmental compliance issues as required by SEN-7 and subsequently issued guidance. Senior line management (DOE-OR and DOE Headquarters) are not being informed by FUSRAP SEN-7 reports of significant environmental compliance deficiencies. The Audit team identified 11 compliance-related findings associated with environmental regulations and DOE Orders of which personnel at FUSRAP were aware, or partially aware, but which do not appear in FUSRAP SEN-7 reports (other than in statistical summaries). Specific examples include:

- Failure to adequately analyze investigation-derived wastes stored in Building 76 (WM/CF-1). This deficiency was included in the ORNL audit conducted in October 1989. No specific discussion on this regulatory violation was included in subsequent SEN-7 reports (MGT-30).
- Inadequate community relations in support of the RI/FS (IWS/CF-2). This deficiency is a direct result of delays incurred in implementing required community relations activities at Maywood due to DOE Headquarters delays in approving the Environmental Impact Statement (EIS) Notice of Intent (NOI). The SEN-7 report issued for September 1990 failed to inform DOE Headquarters of the compliance impacts as a result of delays in approving the NOI (MGT-30).

With few exceptions, FUSRAP SEN-7 reports are vague and, in general, communicate compliance issues only in statistical summary form. No reference to DOE Orders is provided in any FUSRAP SEN-7 report reviewed, as is required by the August 21, 1989 Secretarial guidance (MGT-30). Additionally, FUSRAP SEN-7 reports have not included an evaluation of ENI's performance or concise executive summaries as required by the January 31, 1990 guidance issued by EH-1 (MGT-30).

This finding was not included in any DOE line management self-assessment, as none has been completed.

The causal factor contributing to this finding is inadequate policy implementation.

MGT/CF-3 Inadequate Self-Assessment Program

Performance Objective: On January 26, 1990, Secretary Watkins transmitted to Secretarial and Operations Office managers a trends analysis conducted on the results of the first six Tiger Team Assessments. Included in this transmittal was a directive that all line management organizations institute a formal self-assessment program. On July 31, 1990, Secretary Watkins transmitted to Secretarial and Operations Office managers detailed guidance to be used by line management organizations in developing their self-assessment programs. The guidance included the following elements: self-assessment programs are required to include functional and management appraisals of contractors by DOE line management; the programs will involve all levels of line management, including DOE Headquarters; the programs will encompass specific operating procedures including authorities, responsibilities, and planning requirements; the programs will include a formal lessons-learned program; and they will require that action plans that are developed to address deficiencies also address root causes.

Finding: The DOE-OR line management self-assessment program does not comply with the substantive requirements in the ES&H self-assessment guidance.

Within the DOE-OR, the AM/ERWM is the DOE line organization responsible for all DOE-OR environmental restoration and waste management activities. Under the AM/ERWM is the FSRD, which is the DOE line organization responsible for management of the FUSRAP sites. A formal self-assessment program for the AM/ERWM has not been developed. However, the position of AM/ERWM has only recently been established. FSRD has independently developed a formal self-assessment program which meets many of the requirements specified in the ES&H self-assessment guidance (MGT-1). However, in part due to the absence of a top-tier self-assessment program by the AM/ERWM, there are deficiencies in the FUSRAP self-assessment program.

A fundamental element of the self-assessment guidance is that functional and management appraisals of contractors by DOE line management is required. FSRD does not conduct functional and management appraisals or formal surveillances of BNI. The FSRD self-assessment program conducts informal evaluations of BNI and relies on formal appraisals conducted by the DOE-OR AM/ES&Q, independent contractors, and BNI. The use of these resources in conducting self-assessments of the FUSRAP program does not aid in developing self-assessment expertise within the DOE line organization. FSRD conducts an annual review of BNI's performance under the FUSRAP contract pursuant to Oak Ridge Order OR 13XX.1C, but this only reviews BNI's effectiveness as determined by routine interfaces with BNI and off-line (external of the AM/ERWM) audits, appraisals, and surveillances. No DOE-OR organization conducts formal surveillances of the BNI FUSRAP program (I-ATL-2, I-ATL-4, I-ATL-5). See Audit Finding QA/CF-3 for additional information regarding lack of DOE surveillances.

The FUSRAP self-assessment program does not include specific operating procedures, including lines of authority, responsibilities, and planning requirements, nor does it specify involvement by senior DOE-OR and Headquarters management (MGT-1). Therefore, it cannot be assured that senior line management (both DOE-OR and DOE Headquarters) will be apprised of FUSRAP deficiencies and their inherent causes. FSRD's formal program requires that the fundamental causes of deficiencies be determined, but there is no formal DOE or internal BNI QA requirement that such causes also be addressed in formal action plans (I-ATL-5, MGT-1, MGT-6). Informally, the Director of the FSRD has tasked BNI to prepare separate actions addressing fundamental causes for all audit findings. Additionally, the FUSRAP self-assessment program does not include a formalized lessons-learned program to ensure aggressive dissemination of potential deficiencies from one FUSRAP site to another (see Finding QA/CF-2).

The FSRD self-assessment program does not fully comply with the Secretarial guidance or internal guidance issued by the AM/ES&Q (MGT-2). FSRD is aware of deficiencies in its self-assessment program and is taking steps to improve. Some of the stated deficiencies should be addressed upon establishment of a formal self-assessment program by the AM/ERWM.

The probable causal factor for this finding is failure to implement the DOE policy to establish a self-assessment program.

MGT/BMPF-1 Ineffective Communication Between Departments in the BNI FUSRAP Program

Performance Objective: Corporate policy and practices should reflect a strong commitment to excellence in all activities, including ES&H. Management promotes communication between all organizations.

Finding: DOE and BNI do not have a program to verify uniform dissemination of information between departments.

Prior to remediating or modifying commercial or private property, a contractor will make sure he has good documentation on the "as-built" status of the property. For the MISS, this information is not readily available. For example, internal correspondence at BNI reflects a known sinkhole on the Maywood property; however, this information was not placed on "as built" drawings, and when the property was cleared (summer 1990) the sinkhole was rediscovered. Also, additional underground drains and manholes were discovered after clearing.

FUSRAP personnel were aware of this situation, but it did not appear in any audits, appraisals, or self-assessment.

The probable causal factor for this finding is inadequate design, in that there was a failure to prepare and disseminate accurate "as-builts."

MGT/BMPF-2 Inadequate DOE Surveillance Review of the BNI Management Control System

Performance Objective: Surveillances should be planned on an annual or more frequent basis to ensure thorough coverage of the major Cost and Schedule Control Systems Criteria (CSCSC) categories and system disciplines. Cost accounts in each major function area should be reviewed in depth to ensure the adequacy of integration of all systems at the cost account level.

Finding: No surveillance of the CSCSC system has been performed since 1987. One of the primary purposes of the CSCSC is to increase DOE management awareness of the status of a contractor's progress. This gives management, both at DOE and at BNI, early recognition of current problems so that corrective action may be taken before these problems severely impact cost, schedule, and/or technical performance.

The DOE-OR Planning and Budget Department indicates that it has no plans to perform surveillance on BNI or any other DOE-OR contractor's validated CSCSC system.

DOE's self-assessment program does not comply with the Secretarial guidance for CSCSC system review or surveillance guidance.

The probable causal factor for this finding is failure to conduct appraisals due to lack of resources.

3.11 Special Issues

Special issues are topics or situations which do not meet the criteria for findings but which are pertinent to the assessment of the management and execution of environmental activities for the Formerly Utilized Sites Remedial Action Program (FUSRAP) and the Maywood Site. During the Environmental Audit of the Maywood Site, one special issue was identified: a minor ambiguity exists in the language of the Federal Facilities Agreement (FFA) entered into by the U.S. Department of Energy (DOE) and the U.S. Environmental Protection Agency (EPA). This special issue is discussed below.

SI-1 FFA Language Ambiguities

Under the Purpose Section of the FFA, two paragraphs {II.B.(3) and II.B.(4)} can be read to be inconsistent, leading to ambiguity in the interpretation of the applicability of FUSRAP waste or Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) hazardous substances at the Maywood Interim Storage Site (MISS) and the vicinity properties. Paragraph II.B.(3) establishes a purpose for a Remedial Investigation/Feasibility Study (RI/FS) to prevent, mitigate, or abate the release or threatened release of FUSRAP waste at the site in accordance with CERCLA. Paragraph II.B.(4) establishes a purpose for response actions at the site to attain that degree of cleanup of hazardous substances, pollutants, or contaminants mandated by CERCLA. The reading of an inconsistency between these two paragraphs could bring into questions DOE's responsibilities for specific properties and contaminants, and raise concerns that DOE is doing less than or more than what is required.

Currently, the FFA is in a public review period. These two paragraphs are a source of ambiguity to the non-technical reader who is trying to determine what hazardous materials (i.e., FUSRAP waste or CERCLA hazardous substances) are going to be cleaned up at what location (i.e., the MISS versus the vicinity properties). In order to obtain an understanding of what is to be remediated where, the reader must read and understand the Definitions Section (Section IV.J.) for a definition of "FUSRAP waste" and a definition of the "site." In addition, other paragraphs dispersed throughout the FFA more clearly define this key relationship. Such a paragraph exists in Section VII, U.S. EPA Determinations, where DOE is determined to be the owner of the MISS facility and is responsible for all response actions related to FUSRAP waste associated with the MISS and all vicinity properties, and all contamination (i.e., CERCLA hazardous substances) related to the MISS. Another such paragraph exists in Section XVII, Additional Work or Modification to Work. Under Section XVII.F., additional properties may be proposed by the parties of the FFA for further remedial investigation or remedial action pursuant to the FFA, provided there are data indicating the property is contaminated with FUSRAP waste. Actions taken by DOE are consistent with EPA's interpretation and consistent with the best reading of the FFA.

One of the primary responsibilities of the Audit team is to determine the compliance of current or planned remedial activities being conducted by the FUSRAP under the FFA. Because of the ambiguities noted in the language of the document, the Audit team was unable to completely assess the degree to which current and planned FUSRAP activities comply with the requirements of the FFA.

APPENDICES

APPENDIX A
AUDIT TEAM PERSONNEL

NAME: Lee Stevens

AREA OF RESP: DOE Audit Team Leader

ASSOCIATION: U.S. Department of Energy, Office of Environmental Audit

EXPERIENCE: 18 Years

- Environment Subteam Leader for Tiger Team Environmental Assessments of the Kansas City Plant, the Pinellas Plant, and the Hanford Site. Assistant Team Leader for Environmental Surveys at the Idaho National Engineering Laboratory, National Institute for Petroleum Energy Research, Ames Laboratory, Princeton Plasma Physics Laboratory, and Argonne National Laboratory.
- Environmental Manager, U.S. Naval Petroleum Reserves in California
- Environmental Protection Specialist, Federal Prototype Oil Shale Leasing Program
- Policy Analyst, Enforcement, U.S. Environmental Protection Agency (EPA)
- Enforcement Engineer, Jefferson County Air Pollution Control District

EDUCATION: B.M.E., University of Louisville, J.B. Speed Scientific School

NAME: William A. Eckroade

AREA OF RESP: Assistant Audit Team Leader

ASSOCIATION: U.S. Department of Energy

EXPERIENCE: 4 Years

- U.S. Department of Energy, Office of Environmental Audit
 - Environmental Engineer under the direction of the Audit Team Leader/Environmental Subteam Leader, provides guidance, direction and assistance to a multidisciplined group of professionals performing Environmental Audits and Tiger Team Assessments at DOE facilities.
 - Served as the Assistant Team Leader for the Maywood, New Jersey Environmental Audit.
- U.S. Department of Energy, Office of Environmental Compliance
 - Environmental Engineer responsible for conducting independent oversight of environmental compliance activities at the Savannah River Site.
- U.S. Environmental Protection Agency, Office of Waste Programs Enforcement
 - Environmental Engineer responsible for providing assistance in technical case development to assigned EPA regional offices. Additionally, responsible for conducting oversight of Regional activities involving all Superfund activities at enforcement lead sites.

EDUCATION: M.S., Civil Engineering, University of Maryland
B.S., Geophysics, Virginia Polytechnic Institute

NAME: Benny L. Evans

AREA OF RESP: Management Systems

ASSOCIATION: ICF Kaiser Engineers

EXPERIENCE: 25 Years

- Management Specialist for the Tiger Team Environmental Assessment at the Y-12 Plant and Technical Safety Appraisals at Los Alamos National Laboratory.
- Currently responsible for OSHA compliance inspection at Sandia and Los Alamos National Laboratories; Environmental, Health and Safety audits and appraisal support at Los Alamos National Laboratory, and definitive design and contracts management at Los Alamos National Laboratory and the U.S. Department of Agriculture.
- Project Manager on an 840-MVA commercial nuclear power station. Responsible for estimating, purchasing, construction, testing, and startup of all electrical systems.

EDUCATION: B.S., Electrical Engineering, Youngstown State University
Graduate Studies in Business Management, Youngstown State University
Graduate Studies in Mechanical Engineering, University of Cincinnati
Graduate Studies in Environmental Engineering, University of New Mexico

NAME: Mark R. Francis

AREA OF RESP: Radiation

ASSOCIATION: NUS Corporation

EXPERIENCE: 14 Years

- Radiation Technical Specialist for Tiger Team Environmental Assessments at the Pinellas Plant and Hanford Site. Contractor Coordinator for the Tiger Team Environmental Assessments at the West Valley Demonstration Project and the Portsmouth Gaseous Diffusion Plant. Has participated in the DOE Environmental Survey program since 1986 and performed Surveys at the Portsmouth, Paducah, and Oak Ridge Gaseous Diffusion Plants as well as the Lawrence Livermore, Sandia Livermore, Fermilab, Brookhaven, and Santa Susana Laboratories. At five of these sites, served as Team Coordinator.
- More than 14 years of experience in Environmental Safety and Health related professions. Recipient of Tiger Team specific training in radiation compliance assessment procedures, as well as root cause analysis training to help identify underlying reasons for environmental problem conditions.

EDUCATION: B.S., Environmental Resource Management,
Pennsylvania State University
M.S., Occupational and Environmental Health, Wayne
State University

NAME: John P. McCann

AREA OF RESP: Inactive Waste Sites

ASSOCIATION: Civil and Environmental Consultants, Inc.

EXPERIENCE: 11 Years

- Inactive Waste Sites Technical Specialist on Tiger Team Assessments for the Y-12 Plant, Savannah River Site, Argonne National Laboratory, and the Hanford Site.
- Director of CEC's Health, Safety, and Regulatory Compliance Program and Senior Project Manager. Principal responsibilities include program management in Corporate Health and Safety, Chemical Hazard Evaluation/Risk Assessment, Hazardous Waste Site Assessments, and Environmental Compliance Audits.
- Project Manager of a Remedial Investigation to determine the extent of groundwater and soil contamination at an abandoned tanker-truck facility in eastern Texas. Also managed a DOD Installation Restoration Program environmental assessment concerning a jet fuel spill at an Air Force base in southern Florida.

EDUCATION: B.S., Environmental Health, Colorado State University
M.S., (anticipated) Environmental Chemical Hazard Assessment, Graduate School of Public Health, University of Pittsburgh

NAME: Mark D. Notich

AREA OF RESP: Team Coordinator

ASSOCIATION: NUS Corporation

EXPERIENCE: 12 Years

- Contractor Coordinator for Tiger Team Environmental Assessments for the Y-12 Plant, Pinellas Plant, and Hanford Site. Toxic and Chemical Materials and Quality Assurance Technical Specialist for the Tiger Team Environmental Assessment at the Rocky Flats Plant, Environmental Audit at the Bonneville Power Administration, and Environmental Surveys at Argonne National Laboratory, Oak Ridge National Laboratory, Pittsburgh Energy Technology Center, Morgantown Energy Technology Center, and Naval Petroleum Reserves in California.
- Certified auditor in accordance with NQA-1 requirements.
- Served as Quality Assurance Officer for the Alternate Remedial Contracting Services (ARCS) efforts for EPA Regions I and III. Environmental chemist experienced in environmental sample analysis by gas chromatography, atomic absorption, and wet chemical methods.

EDUCATION: B.S., Chemistry, University of Maryland

NAME: Daniel B. Nugent

AREA OF RESP: Air

ASSOCIATION: NUS Corporation

EXPERIENCE: 6 Years

- NUS Corporation, Air/Radiation Sciences Department

- Project Manager on several environmental permitting activities associated with air emissions compliance at industrial processing facilities. Responsible for coordination of project team in assessing regulatory applicability/compliance, technical review and oversight of protocols and reports, interface with regulatory agencies.
- Project Manager/Air Quality Meteorologist for an air toxic compliance assessment. Responsibilities included facility emissions assessment, air quality modeling, compliance reporting, and interface with regulatory agencies.
- Project Manager/Air Quality Meteorologist for environmental and licensing support to the Perry Nuclear Power Plant. Responsibilities include coordination of this multidisciplined project, evaluation and reporting of meteorological data, including radiological dose assessment, as required by Nuclear Regulatory Commission requirements.
- Project Manager/Air Quality Meteorologist for environmental audits of ambient air and meteorological monitoring systems. Responsibilities include in-field auditing of monitoring equipment and auditing of associated program files.

EDUCATION: B.S., Meteorology, The Pennsylvania State University

NAME: Kim Turnbull

AREA OF RESP: Surface Water

ASSOCIATION: NUS Corporation

EXPERIENCE: 12 Years

- Surface Water Technical Specialist for the Tiger Team Environmental Assessments at the Kansas City Plant and Sandia National Laboratories, Livermore and the Environmental Survey for Argonne National Laboratory.
- Conducted sampling of surface water, sediment, soil, groundwater, and wastes. Participated in design of various treatment systems including engineering, feasibility, and treatability evaluations. Responsible for NPDES-related issues, including permit applications and spill control plans.
- Participated in all phases of remedial investigations and feasibility studies at Superfund sites and other active and inactive waste disposal sites.

EDUCATION: B.S., Environmental Engineering, Pennsylvania State University

NAME: Philip R. Winsborough

AREA OF RESP: Groundwater

ASSOCIATION: NUS Corporation

EXPERIENCE: 16 Years

- Groundwater/RCRA Technical Specialist for Tiger Team Environmental Assessments at the Kansas City Plant, Pinellas Plant, Pantex Plant, Lawrence Livermore National Laboratory, and Hanford Site.
- Project Manager for Hydrology/RCRA programs concentrating on RCRA remedial investigations, closures and groundwater investigations.
- As a staff geologist with the Hazardous and Solid Waste Enforcement Division of the Texas Water Commission, reviewed compliance with RCRA and state regulations by industries, reviewed inspections for compliance, wrote enforcement and compliance orders, reviewed groundwater models of contaminant transport, and served as expert witness in RCRA public hearings on hazardous waste facility permits.
- Performed groundwater assessments in support of surface mining, deep well injection, water supply, RCRA and state regulations, and conducted Environmental Impact Assessments.

EDUCATION: B.A., Geology, University of Texas at Austin
Graduate Studies in Hydrogeology, Villanova University

NAME: David M. Wunsch

AREA OF RESP: Quality Assurance

ASSOCIATION: NUS Corporation

EXPERIENCE: 12 Years

- Toxic and Chemical Materials and Quality Assurance Technical Specialist for the Tiger Team Environmental Assessments at the Feed Materials Production Center (Fernald), Portsmouth Uranium Enrichment Complex, Brookhaven National Laboratory, and Paducah Gaseous Diffusion Plant. Served as Contractor Coordinator for the Environmental Audit of the Bonneville Power Administration.
- Environmental scientist with broad experience including laboratory management in medical research and environmental analytical chemistry; toxic and hazardous materials management; writing QA manuals; and writing environmental chemistry sections of QA project plans and program plans. Member of the American Society for Quality Assurance and certified QA auditor for NUS Corporation.
- Management positions held in both line and staff organizations with experience in operations, administration, and staff reorganization.

EDUCATION: M.B.A., Management Studies, Loyola College
M.S., Pharmacology, New York State Medical College
M.Sc., Applied Physiology, University of Guelph
B.S., Animal Science, Rutgers University

APPENDIX B
MAYWOOD AUDIT PLAN

1.0

INTRODUCTION

The purpose of the Environmental Audit of the Maywood Interim Storage Site (MISS) or Maywood site is to provide the Secretary of Energy with information on the current environmental regulatory compliance status and associated vulnerabilities of the facility, root cause for noncompliances, adequacy of DOE and site contractor environmental management programs, and response actions to address the identified problem areas.

The scope of the Maywood audit is comprehensive, covering all environmental media and applicable Federal, state, and local regulations, requirements, and best management practices (BMPs). The environmental disciplines to be addressed in this audit include air, soil, surface water, waste management, groundwater, radiation, quality assurance, and inactive waste sites and releases.

The Maywood site is part of the Formerly Utilized Sites Remedial Action Program (FUSRAP), a DOE program to identify and decontaminate or otherwise control sites where residual radioactive materials (exceeding current guidelines) remain from the early years of the nation's atomic energy program or from commercial operations causing conditions that Congress has mandated DOE to remedy.

From 1919 to 1956, Maywood Chemical Works processed monazite sand (thorium ore) for use in manufacturing industrial products such as mantles for gas lanterns. During that time, slurry containing process wastes from the thorium operations was pumped to diked areas west of the plant. Some of these process wastes were removed from Maywood Chemical Works and used as mulch and fill on nearby properties, thereby contaminating them. Some of the material migrated off site via natural drainage formerly provided by Lodi Brook. In 1932, New Jersey Route 17 was built through this disposal area.

The Maywood site was assigned to DOE as part of the decontamination research and development project initially authorized by Congress under the 1984 Energy and Water Appropriations Act. In 1984, DOE negotiated an agreement with the Stepan Company for access to an 11.7 acre portion of the Stepan Company property on which to establish MISS, pending execution of an agreement to transfer ownership of the site to DOE. Development of the storage site commenced, and contaminated materials removed from 17 vicinity properties in Maywood and Rochelle Park were brought to the site in 1984. In 1985, remedial action was conducted at eight residential properties in the Borough of Lodi and at the Ballod property in Rochelle Park. In September 1985, ownership of the MISS property was transferred to DOE.

2.0

ENVIRONMENTAL AUDIT IMPLEMENTATION

The Maywood Environmental Audit will be conducted by a team of technical specialists, managed by a Team Leader and an Assistant Team Leader from the Office of Environmental Audit (OEV). The technical specialists are from NUS Corporation, CEC Inc., and ICF Kaiser. The names and responsibilities are listed below:

Lee Stevens	Team Leader
Bill Eckroade	Assistant Team Leader/Waste Management
Mark Notich	Team Coordinator
Dan Nugent	Air
Kim Turnbull	Surface Water
Mark Francis	Radiation
Phil Winsborough	Groundwater
Dave Wunsch	Quality Assurance
John McCann	Inactive Waste Sites
Ben Evans	Management Systems

2.1

Pre-Assessment Activities

Pre-Assessment activities for the Maywood audit included the issuance of an introduction and information request memorandum (Stevens, September 28, 1990), a Pre-Assessment Site Visit, and initial review of documentation which was sent to the Environmental Team by FUSRAP personnel responsible for the Maywood Site as a result of the information request memorandum.

A Pre-Assessment Site Visit was conducted on October 16, 1990 by the NUS Team Coordinator, Radiation/Air Specialist, and Groundwater Specialist to observe quarterly environmental monitoring sampling. The DOE Team Leader, Assistant Team Leader, and NUS Team Coordinator visited the FUSRAP Program Management offices in Oak Ridge, Tennessee on October 18 in order to become more familiar with the site, to review information being supplied and request additional information, and to coordinate plans for the upcoming audit with the Oak Ridge Operations Office (ORO) and the program contractor, Bechtel National, Inc. (BNI).

2.2

On-Site Activities and Reports

The on-site activities for the Environmental audit will take place between November 7, 1990 and November 16, 1990. On-site activities include field inspections, file/record reviews, and interviews with site and program personnel. A listing of personnel and/or positions to be interviewed during the audit is shown in the individual technical specialist discussions presented later in this plan. Any and all modifications to this list will be coordinated with the Audit Team site contacts from ORO or BNI.

The schedule of activities for the Maywood audit is as follows:

November 7, 1990	Arrive at Maywood, NJ site at 8:00 AM. Receive H&S briefing and site overview. Begin discussions with DOE and BNI personnel concerning environmental activities at Maywood. Continue discussions and interviews for remainder of day.
November 8, 1990	Continue discussions and interviews from previous day concerning environmental activities at the Maywood Site. leave site in early afternoon for travel to Oak Ridge.
November 9, 1990	Begin discussions and interviews with DOE and BNI personnel concerning FUSRAP program activities with regard to the Maywood site. Continue interviews, discussions, and document reviews for remainder of the day.
November 10, 1990	Continue interviews, discussions, and document reviews.
November 11, 1990	Continue interviews, discussions, and document reviews. Begin preparation of findings.
November 12, 1990	Complete interviews and discussions with site and program personnel. Continue preparation of findings. Overviews and first draft of findings due to Word Processing.
November 13, 1990	Continue findings preparation with second draft due to WP. Findings given to site representatives for review and comment.
November 14, 1990	Technical accuracy review comments from site. Team incorporates comments.

November 15, 1990	Continue the incorporation of site comments. Report to printer in afternoon.
November 16, 1990	Mid-morning close out briefing with DOE and BNI program personnel.

A close out briefing will be conducted at the conclusion of the on-site activities. Findings from the environmental Audit will be presented. A draft report containing the findings will be provided for review and comment to ORO, the FUSRAP Program Office, and the site contractors.

3.0 AIR

The radioactive and nonradioactive air-related compliance assessment activities involve an assessment of the site-wide air emissions, emissions monitoring equipment, and the acquisition and processing of ambient air quality data. Operational and procedural practices associated with emission control equipment will be evaluated. Compliance with the applicable local air authority's regulations, New Jersey State air regulations, and National Emission Standards for Hazardous Air Pollutants (NESHAP) requirements will also be assessed. In addition, fugitive sources of particulate and gaseous emissions and any mitigative procedures will be investigated.

The ambient air monitoring system assessment will involve inspection of the ambient samplers and meteorological equipment, and review of procedures applicable to data acquisition, calibration, data validation, and data processing. The primary emphasis will be an assessment of these procedures to characterize the environmental impact of facility operations and the defensibility of the collected data.

Areas of special interest include:

- Sampling network
- Waiver request for Subpart H
- Dose assessment

Personnel to be interviewed include, but are not limited to:

- Site monitoring personnel regarding ambient monitoring system
- Site radiation personnel regarding dose assessment
- FUSRAP Project EH&S Manager and Assistant Manager
- FUSRAP Project Manager for NJ Sites
- EH&S Team Supervisor for Maywood Site
- Environmental Compliance and Monitoring Group Supervisor
- Technical Support Group Supervisor
- Maywood Operation Coordinator

4.0

SURFACE WATER

The focus of the surface water/drinking water portion of the Maywood Audit will be on the release of polluted or contaminated wastewaters to surface waters, the sanitary sewer and septic tank systems (if applicable), or groundwater aquifers underlying the site. Pathways for off-site migration of pollutants include:

- Spills or releases into permeable soil areas;
- Releases (accidental or planned) to sanitary sewers and/or storm water drains without retention, chemical and radiological analysis, or treatment; and
- Contaminated surface run-off into drains or sewers leading to local surface water features or into permeable soil areas.

The audit will assess the potential for contamination of storm waters and/or runoff by metals, organics, and radionuclides as well as review present conditions for storm water control, collection and treatment. Copies of standard operating procedures (SOPs), field logbooks, and maintenance records will be reviewed.

Areas of special interest include:

- Need for a storm water discharge permit;
- Flood plain issues;
- Surface drainage issues;
- Sampling of groundwater which discharges to surface water; and
- Characterization of flow regime onto and off site via storm drains.

Personnel to be interviewed include, but are not limited to:

- Site monitoring personnel regarding surface water monitoring
- FUSRAP Project EH&S Manager and Assistant Manager
- FUSRAP Project Manager for NJ Sites
- EH&S Team Supervisor for Maywood Site
- Environmental Compliance and Monitoring Group Supervisor
- Technical Support Group Supervisor
- Maywood Operation Coordinator

5.0

RADIATION

The radiological portion of the environmental audit will involve review and observation of site-wide radioactive emissions and effluents, emission and effluent control and monitoring, and the associated impact on the public and the environment. This review will include atmospheric, liquid, and terrestrial pathways. The audit will also include direct radiation exposure issues, dose assessment methodologies, and quality assurance (QA) programs for radiation-related environmental monitoring. The audit will determine:

- Conformance with radiological standards and requirements in applicable Federal, state, and local regulations, permits, agreements, orders, and consent decrees;
- Conformance with radiological standards and requirements in DOE Orders;
- Adequacy of DOE-ORO and Maywood site radiological environmental/public protection programs, including planning, organization, resources, procedures, and documentation and training, to effectively and reliably implement/maintain the intent/standards contained in the previously mentioned documents;
- Relationships with regulatory agencies; and
- Conformance with and ability to adopt applicable radiological "best" and "accepted" industry practices.

The assessment will be based on observations of programmatic processes, operations, emission control and monitoring, environmental monitoring, and environmental/public impact analyses. Procedures and/or documentation associated with these activities will be reviewed; discussions will be held with operational and supervisory personnel.

The radiological portion of the audit will be coordinated with the air, surface water, groundwater, inactive waste sites, and quality assurance technical disciplines.

Areas of special interest include:

- Survey techniques for vicinity properties;
- Sampling and analysis of environmental radiological samples;
- Cleanup levels and documentation;
- Dose assessment from storage pile and vicinity properties;
- ALARA (As Low As Reasonably Achievable) Procedures
- EG&G Flyover data

Personnel to be interviewed include, but are not limited to:

- Site monitoring personnel regarding ambient monitoring system
- Site radiation personnel regarding dose assessment
- FUSRAP Project EH&S Manager and Assistant Manager
- FUSRAP Project Manager for NJ Sites
- EH&S Team Supervisor for Maywood Site
- Environmental Compliance and Monitoring Group Supervisor
- Technical Support Group Supervisor
- Maywood Operation Coordinator

6.0

WASTE MANAGEMENT

The solid/hazardous/ radioactive waste assessment will be carried out by reviewing and evaluating all activities generating solid wastes, and the treatment, storage, recycling and disposal practices involved in the handling of solid wastes.

Discussions will be held with those individuals knowledgeable of waste management practices in order to develop an understanding of past and existing waste management practices. Discussions will be held with Maywood (BNI) personnel to determine the extent of solid/hazardous waste generation at the site.

The review of the solid/hazardous/radioactive waste practices will be coordinated with the Inactive Waste Sites assesment to identify if wastes generated from CERCLA activities are properly managed; the radiological assessment to define problems with wastes containing radioactive constituents; and surface water assessment since any overland runoff from stored wastes would flow toward nearby surface water features.

Areas of special interest include:

- Applicability of RCRA regulations to Maywood operations;
- Determination of the degree of compliance with applicable RCRA regulations;
- Waste analysis;
- Waste storage; and
- Waste Treatment

Personnel to be interviewed include, but are not limited to:

- Site personnel regarding waste generation
- Site radiation personnel regarding radiological assessment of drilling spoils
- FUSRAP Project EH&S Manager and Assistant Manager
- FUSRAP Project Manager for NJ Sites
- EH&S Team Supervisor for Maywood Site
- Environmental Compliance and Monitoring Group Supervisor
- Technical Support Group Supervisor
- Maywood Operation Coordinator

7.0

GROUNDWATER

The Maywood audit will involve the evaluation of previous studies of site hydrogeology, determination of the status of ongoing studies, investigations, and remedial actions, and the review of plans for future investigations and remedial actions. Inspection of the Maywood site will be conducted jointly with the

Inactive Waste Sites and/or Surface Water technical specialists. Well construction will be reviewed both on "as-built" diagrams and in the field.

Areas of special interest include:

- Connections between upper and lower aquifers;
- Hydrogeologic characterizations of the groundwater regime;
- Horizontal and vertical extent of contamination;
- Upgradient and background characterizations; and
- Dose assessments.

Personnel to be interviewed include, but are not limited to:

- Site monitoring personnel regarding groundwater monitoring system
- Site radiation personnel regarding dose assessment
- FUSRAP Project EH&S Manager and Assistant Manager
- FUSRAP Project Manager for NJ Sites
- EH&S Team Supervisor for Maywood Site
- Environmental Compliance and Monitoring Group Supervisor
- Technical Support Group Supervisor
- Maywood Operation Coordinator

8.0 QUALITY ASSURANCE

The quality assurance (QA) portion of the Maywood audit will consist of an evaluation of current S&A procedures performed at the Maywood site or at any off-site laboratories conducting analyses on Maywood environmental samples to ensure that they result in the generation of scientifically valid and defensible data. The objective will be to assess the QA procedures for collecting process effluent and environmental samples, and for performing the laboratory analyses to identify and quantify contaminants, as well as for evaluating the reporting the data. Aspects of the QA program relating to environmental management of the Maywood Site which will be evaluated include training; instrument calibration and maintenance; sample collection, preservation, handling, and chain-of-custody procedures; blank, replicate, and spiked sample results; data reduction and reporting; and data documentation, including logbook and calculation reviews and archival data storage.

Sampling and analysis procedures will be reviewed to ensure that they conform to regulatory requirements and/or accepted practice and are being properly implemented by DOE and BNI. Also, the interlaboratory test programs participated in by the various subcontractor labs as administered by the DOE's Environmental Measurements Laboratory and the EPA will be evaluated for the laboratories' corrective action plans.

A review of the QA program organization and operations with regard to environmental activities at the Maywood Site will be conducted. This will entail reviews of QA manuals and QA Project Plans, reviews of QA procedures for QA monitoring, corrective actions and follow up surveillances, and discussions with QA personnel to determine the emphasis placed on quality assurance for environmental activities at the Maywood Site with regard to NQA-1 guidelines.

Areas of special interest will include;

- Compliance with NQA-1 guidelines and specification;
- QA specifications in environmental monitoring subcontracts;
- Adequacy of QA Project Plans;
- Extent and adequacy of QA oversight;
- Internal and external program audits and corrective actions; and
- Laboratory proficiency testing.

Personnel to be interviewed include, but are not limited to:

- Site monitoring personnel regarding QA in environmental monitoring
- FUSRAP Project QA/QC Supervisor
- FUSRAP Quality Assurance Officer
- EH&S Supervisor and Assistant Supervisor
- Environmental Compliance and Monitoring Group Supervisor
- Technical Support Group Supervisor
- Maywood Operation Coordinator
- New Jersey Sites Group Supervisor
- TMA/Eberline Subcontract Administrator
- R.F. Weston Subcontract Administrator
- Project procurement Supervisor
- Project Manager - New Jersey Sites
- DOE Site Manager

9.0 INACTIVE WASTE SITES

The objective of the inactive waste sites portion of the Environmental Audit of the Maywood site is to determine whether the current activities at Maywood that are being performed under the Federal Facilities Compliance Agreement (FFCA) fulfill the requirements of CERCLA, as amended, and the FFCA. Additional areas that will be addressed in this portion of the audit include the adequacy of reporting under SARA Title III, the methods used to quantify spills,, and the spill reporting procedures.

The assessment will review completed work and that which is planned to determine its consistency with the FFCA, applicable New Jersey state and DOE regulations, the National Contingency Plan, and pertinent RI/FS and RI/CMS guidance issued by the EPA.

Areas of special interest will include:

- Accurate chronology and history of remedial activities at Maywood
- CERCLA compliance elements
- SARA Title III spill reporting
- Environmental Cleanup and Response Act (ECRA)
- National Contingency Act (NCP) issues
- Evaluation of vicinity properties
- FUSRAP Guidelines and Procedures

Personnel to be interviewed include, but are not limited to:

- Site monitoring personnel regarding environmental monitoring
- FUSRAP Quality Assurance Officer
- EH&S Supervisor and Assistant Supervisor
- Environmental Compliance and Monitoring Group Supervisor
- Technical Support Group Supervisor
- Maywood Operation Coordinator
- New Jersey Sites Group Supervisor
- Project Manager - New Jersey Sites
- Construction Manager Maywood Site
- DOE Site Manager
- DOE Technical Service Division Director (FUSRAP Proj. Manager)
- Director - Office of Remedial Action and Waste Technology
- Director - Office Division of Facility and Site Decommissioning Project

10.0 MANAGEMENT SYSTEMS

The objective of the management systems portion of the Maywood audit is to determine the effectiveness of management's performance with regard to implementation of DOE ES&H objectives.

Areas of special interest will include:

- Corporate policy and culture;
- Management organization and structure;
- Planning;
- Human resource management;
- Management systems;
- Public and institutional interactions; and
- DOE oversight.

Personnel to be interviewed include, but are not limited to:

- DOE - ORO Manager
- DOE Project Operations Group Supervisor
- BNI EH&S Supervisor and Assistant Supervisor
- BNI Program Manager and Deputy Program Manager
- DOE Project Support Group Supervisor
- Maywood Operation Coordinator
- New Jersey Sites Group Supervisor
- Project Manager - New Jersey Sites
- Construction Manager Maywood Site
- Engineering Manager Maywood Site
- DOE Technical Service Division Director (FUSRAP Proj. Manager)
- Director - Office of Remedial Action and Waste Technology
- Director - Office Division of Facility and Site Decommissioning Project

APPENDIX C
LIST OF SITE DOCUMENTS REVIEWED BY THE AUDIT TEAM

LIST OF SITE DOCUMENTS REVIEWED BY THE AUDIT TEAM

DOCUMENT NUMBER	TITLE/DESCRIPTION	AUTHOR/ORGANIZATION/RECIPIENT	DOCUMENT DATE
TL-1	FUSRAP Environmental Protection Program Implementation Plan	Technical Services Division	November 13, 1989
TL-2	Review of the FUSRAP Environmental Protection Program Implementation Plan	James W. Wagoner, II, U.S. Department of Energy Headquarters	February 26, 1990

LIST OF SITE DOCUMENTS REVIEWED BY THE AUDIT TEAM

DOCUMENT NUMBER	TITLE/DESCRIPTION	AUTHOR/ORGANIZATION/RECIPIENT	DOCUMENT DATE
A-1	Environmental Monitoring Plan for the Maywood Site	Bechtel National, Inc./U.S. Department of Energy - Oak Ridge Operations Office	September 1984
A-2	FUSRAP Integrated Environmental Monitoring Field Activities Instruction Guide	Bechtel National, Inc.	October 5, 1990
A-3	Maywood Interim Storage Site Environmental Report for Calendar Year 1988	Bechtel National, Inc.	April 1989
A-4	Formerly Utilized Sites Remedial Action Program Environmental Compliance Assessment Findings	Oak Ridge National Laboratory	May 25, 1990
A-5	Bechtel Audit Report for August - September 1990	Bechtel National, Inc.	October 1990
A-6	Shipping Data Sheets and Field Exchange Logbook (Excerpts) 3rd quarter 1990	Field Personnel/Bechtel National, Inc.	None
A-7	Personal Project Notebook for New Jersey Sites (FUSRAP)	K. Lewis	None
A-8	Maywood Interim Storage Site Environmental Monitoring Summary - Calendar Year 1984	Bechtel National, Inc.	March 1985
A-9	Maywood Interim Storage Site Annual Site Environmental Report - Calendar Year 1985	Bechtel National, Inc.	May 1985
A-10	Maywood Interim Storage Site Annual Site Environmental Report - Calendar Year 1986	Bechtel National, Inc.	June 1987
A-11	Maywood Interim Storage Site Annual Site Environmental Report - Calendar Year 1987	Bechtel National, Inc.	April 1988
A-12	Maywood Interim Storage Site Environmental Report for Calendar Year 1989	Bechtel National, Inc.	May 1990
A-13	Shipping Data Sheets and Field Exchange Logbook (Excerpts) 2nd quarter 1990	Field Personnel/Bechtel National, Inc.	None
A-14	Weekly Site Inspection Forms - New Jersey Sites	Field Personnel/Bechtel National, Inc.	September and October 1990
A-15	Interoffice Memorandum from D.L. Sherwood Subject: Action Item Report New Jersey Sites	Bechtel National, Inc.	November 8, 1990

LIST OF SITE DOCUMENTS REVIEWED BY THE AUDIT TEAM

DOCUMENT NUMBER	TITLE/DESCRIPTION	AUTHOR/ORGANIZATION/RECIPIENT	DOCUMENT DATE
A-16	1987 Local Climatological Data, Annual Summary with Comparative Data, Newark, New Jersey	National Oceanic and Atmospheric Administration	None

LIST OF SITE DOCUMENTS REVIEWED BY THE AUDIT TEAM

DOCUMENT NUMBER	TITLE/DESCRIPTION	AUTHOR/ORGANIZATION/RECIPIENT	DOCUMENT DATE
SW-1	FUSRAP Project Organization and Site Responsibilities	S. Wright/Bechtel National, Inc.	October 10, 1990
SW-2	Characterization Report for the Maywood Interim Storage Site	C.P. Leichtweis, J.A. Liberatore and T.M. Dravecky/Bechtel National, Inc.	June 1987
SW-3	Maywood Interim Storage Site Environmental Monitoring Summary - Calendar Year 1984	Bechtel National, Inc.	July 1985
SW-4	Maywood Interim Storage Site Environmental Monitoring Summary - Calendar Year 1985	Bechtel National, Inc.	May 1986
SW-5	Maywood Interim Storage Site Annual Site Environmental Report - Calendar Year 1986	Bechtel National, Inc.	June 1987
SW-6	Maywood Interim Storage Site Annual Site Environmental Report - Calendar Year 1987	Bechtel National, Inc.	April 1988
SW-7	Maywood Interim Storage Site Annual Site Environmental Report - Calendar Year 1988	Bechtel National, Inc.	April 1989
SW-8	Maywood Interim Storage Site Environmental Report for Calendar Year 1989	Bechtel National, Inc.	April 1990
SW-9	Incident Report Logs and Reports	Bechtel National, Inc.	Various
SW-10	Controlling Spills of Hazardous Materials	Bechtel National, Inc.	December 15, 1987
SW-11	Maywood, New Jersey Site Security Plan	Bechtel National, Inc.	October 20, 1989
SW-12	Site Plan for Maywood	Bechtel National, Inc.	May 1989
SW-13	Environmental Compliance Assessment Findings for MISS, WISS, and MSP	C.F. Sigmon and M.B. Levine/Oak Ridge National Laboratory	May 25, 1990
SW-14	Environmental Protection Program Implementation Plan for FUSRAP - November 9, 1989 to November 9, 1990	G.K. Hovey, M.E. Kaye, T.C. Adler and D.G. Adler/Bechtel National, Inc.	November 13, 1989
SW-15	FUSRAP Integrated Environmental Monitoring Field Activities Instruction Guide	Bechtel National, Inc.	October 5, 1990
SW-16	FUSRAP Daily, Weekly, and Monthly Site Inspection Form	Bechtel National, Inc.	None
SW-17	Remedial Investigation Schedule for the Maywood Site	Bechtel National, Inc.	October 11, 1990

LIST OF SITE DOCUMENTS REVIEWED BY THE AUDIT TEAM

DOCUMENT NUMBER	TITLE/DESCRIPTION	AUTHOR/ORGANIZATION/RECIPIENT	DOCUMENT DATE
SW-18	Topographic Map of the Maywood Interim Storage Site and Vicinity	Bechtel National, Inc.	Circa 1987
SW-19	Site Analysis - Maywood Chemical Sites (Epic Aerial Photos)	L. Mata/Bionetics Corporation	May 1984
SW-20	Letter to NJDEP Division of Water Resources - Need for Stormwater Discharge Permits	R.G. Atkin/Bechtel National, Inc. to NJDEP	February 2, 1990
SW-21	Analytical Data for Surface Water and Sediment - 1st and 2nd Quarter 1990	TMA Eberline	February 1990 and July 1990
SW-22	Topographic Survey - Portion of Stepan Chemical Company and Vicinity	Fisk Associates	January 3, 1984
SW-23	Work Plan for the RI/FS - EIS for the Maywood Site, Maywood, New Jersey (Draft)	Argonne National Laboratory/Bechtel National, Inc.	July 1990
SW-24	Quality Assurance Project Plan for the RI/FS - EIS for the Maywood Site (Draft)	Bechtel National, Inc.	June 1990
SW-25	Environmental Monitoring Plan for the Maywood Site	Bechtel National, Inc.	September 1984
SW-26	Emergency Response and Notification Planning	Bechtel National, Inc.	October 1, 1990
SW-27	Agreement Between BNI and Waste Conversion for Transport and Disposal of Decon Water	Bechtel National, Inc./Waste Conversion Inc.	September 1989
SW-28	FFAs for Wayne and Maywood FUSRAP Sites	U.S. Department of Energy/U.S. Environmental Protection Agency	October 16, 1990
SW-29	Health and Safety Plan for the RI/FS - EIS for the Maywood Site (Draft)	Bechtel National, Inc.	June 1990
SW-30	Field Sampling Plan for the RI/FS - EIS for the Maywood Site (Draft)	Bechtel National, Inc.	June 1990
SW-31	Flood Hazard Boundary Map - Borough of Maywood, New Jersey	Federal Insurance Administration	December 30, 1977
SW-32	Flood Boundary and Floodway Map - Township of Rochelle Park, New Jersey	Federal Insurance Administration	December 18, 1981
SW-33	Memo Concerning Environmental Monitoring for July 1989	K.K. Lewis, Bechtel National, Inc. to B. Horvath, Bechtel National, Inc.	June 9, 1989

LIST OF SITE DOCUMENTS REVIEWED BY THE AUDIT TEAM

DOCUMENT NUMBER	TITLE/DESCRIPTION	AUTHOR/ORGANIZATION/RECIPIENT	DOCUMENT DATE
SW-34	Memo Concerning Environmental Monitoring for October 1989	K.K. Lewis, Bechtel National, Inc. to B. Horvath, Bechtel National, Inc.	September 15, 1989
SW-35	Request for Analytical Services	T. Adler/Bechtel National, Inc. to Weston	October 16, 1990

LIST OF SITE DOCUMENTS REVIEWED BY THE AUDIT TEAM

DOCUMENT NUMBER	TITLE/DESCRIPTION	AUTHOR/ORGANIZATION/RECIPIENT	DOCUMENT DATE
GW-1	FUSRAP Integrated Environmental Monitoring Field Activities, Instruction Guide 14501-191-00-IG-0: Rev. 1	Bechtel National, Inc.	October 5, 1990
GW-2	Maywood Interim Storage Site Annual Site Environmental Report, Maywood, New Jersey, Calendar Year 1985 DOE/OR/20722-96	Bechtel National, Inc.	May 1986
GW-3	Maywood Interim Storage Site Annual Site Environmental Report, Maywood, New Jersey, Calendar Year 1986 DOE/OR/20722-148	Bechtel National, Inc.	June 1987
GW-4	Maywood Interim Storage Site Annual Site Environmental Report, Maywood, New Jersey, Calendar Year 1987 DOE/OR/20722-195	Bechtel National, Inc.	April 1988
GW-5	Maywood Interim Storage Site Annual Site Environmental Report, Maywood, New Jersey, Calendar Year 1988 DOE/OR/20722-216	Bechtel National, Inc.	April 1988
GW-6	Maywood Interim Storage Site Environmental Report Maywood, for Calendar Year 1989, New Jersey, DOE/OR/20722-267 (Draft)	Bechtel National, Inc.	April 1990
GW-7	Field Sampling Plan for the Remedial Investigation/ Feasibility Study - Environmental Impact Statement for the Maywood Interim Storage Site, Maywood, New Jersey DOE/OR/20722-193.3	Bechtel National, Inc.	June 1990
GW-8	Instruction Guide for Water Level and Precipitation Measurement - FUSRAP Sites 191-IG-007	Bechtel National, Inc.	February 21, 1989
GW-9	Report on Drilling and Well Installations at the Maywood Interim Storage Site, Maywood, New Jersey DOE/OR/20722-75	Bechtel National, Inc.	October 1985
GW-10	Maywood Interim Storage Site Environmental Summary, Maywood, New Jersey, Calendar Year 1984 DOE/OR/20722-60	Bechtel National, Inc.	March 1985
GW-11	Memorandum from NE-23 to Peter Gross, OR Chemical Contamination at FUSRAP Sites	U.S. Department of Energy, NE-23	August 24, 1989

LIST OF SITE DOCUMENTS REVIEWED BY THE AUDIT TEAM

DOCUMENT NUMBER	TITLE/DESCRIPTION	AUTHOR/ORGANIZATION/RECIPIENT	DOCUMENT DATE
GW-12	Maywood Interim Storage Site Monitoring Well Locations, Site Plan, Drawing No. 138-DD0000-C05	Bechtel National, Inc.	June 26, 1990
GW-13	NJDEP Emergency Permit, Maywood Interim Storage Site NJ0054500	State of New Jersey, Department of Environmental Protection, Division of Water Resources	April 8, 1986
GW-14	Letter from Irene Kropp to Peter Gross, OR, November 30, 1989	State of New Jersey, Bureau Chief, Groundwater Pollution Abatement, Division of Water Resources	November 30, 1989
GW-15	Weekly Inspection Records and Water Level Measurements for Calendar Year 1990	Bechtel National, Inc.	1990
GW-16	Corrective Action Request, 90-D-036	Bechtel National, Inc.	August 9, 1990
GW-17	Characterization Report for the Maywood Interim Storage Site, Maywood, New Jersey DOE/OR/20722-139	Bechtel National, Inc.	June 1987
GW-18	DOE/OR ESH&QA Functional Appraisal	U.S. Department of Energy-Oak Ridge Operations Office	June 1990

LIST OF SITE DOCUMENTS REVIEWED BY THE AUDIT TEAM

DOCUMENT NUMBER	TITLE/DESCRIPTION	AUTHOR/ORGANIZATION/RECIPIENT	DOCUMENT DATE
R-1	Maywood Interim Storage Site Environmental Report for Calendar Year 1989, Maywood, New Jersey DOE/OR/20722-267	Bechtel National, Inc.	May 1990
R-2	Characterization Report for the Maywood Interim Storage Site, Maywood, New Jersey DOE/OR/20722-139	Bechtel National, Inc.	June 1987
R-3	Formerly Utilized Sites Remedial Action Program Summary Protocol Identification - Characterization - Designation - Remedial Action - Certification	U.S. Department of Energy	January 1986
R-4	A Manual for Implementing Residual Radioactive Material Guidelines ANL/ES-160, DOE/CH/8901	Argonne National Laboratory, Energy and Environmental Systems Division	June 1989
R-5	Formerly Utilized Sites Remedial Action Program Environmental Protection Program Implementation Plan, November 9, 1989 to November 13, 1990	G.K. Hovey, M.E. Keye, T.C. Adler, and D.G. Adler, Bechtel National, Inc.	November 13, 1989
R-6	Site Plan for Maywood, Maywood, New Jersey DOE/OR/20722-113, Revision 1	Bechtel National, Inc.	May 1989
R-7	FUSRAP Integrated Environmental Monitoring Field Activities Instruction Guide (October 1, 1990 through December 31, 1991)	Bechtel National, Inc.	None
R-8	Implementation Plan for Radiological Surveys Protocols	U.S. Department of Energy	July 1988
R-9	Survey Plan for the Radiological Characterization of Residential Properties, Lodi, New Jersey DOE/OR/20722-49	Bechtel National, Inc., Advanced Technology Division	November 1984
R-10	Radiological Characterization Report for the Residential Property at 17 Redstone Lane, Lodi, New Jersey DOE/OR/20722-235	Bechtel National, Inc.	September 1989
R-11	Radiological Characterization Report for the Residential Property at 7 Branca Court, Lodi, New Jersey DOE/OR/20722-167	Bechtel National, Inc.	November 1988

LIST OF SITE DOCUMENTS REVIEWED BY THE AUDIT TEAM

DOCUMENT NUMBER	TITLE/DESCRIPTION	AUTHOR/ORGANIZATION/RECIPIENT	DOCUMENT DATE
R-12	Radiological Characterization Report for the Commercial Property at 80 Industrial Road (Flint Ink Corporation), Lodi, New Jersey DOE/OR/20722-252	Bechtel National, Inc.	September 1989
R-13	Radiological Characterization Report for the Municipal Property at Fireman's Memorial Park (Garibaldi Avenue), Lodi, New Jersey DOE/OR/20722-250	Bechtel National, Inc.	September 1989
R-14	Radiological Characterization Report for the Residential Property at 26 Long Valley Road, Lodi, New Jersey DOE/OR/20722-173	Bechtel National, Inc.	November 1988
R-15	Radiological Characterization Report for the Residential Property at 60 Trudy Drive, Lodi, New Jersey DOE/OR/20722-243	Bechtel National, Inc.	September 1989
R-16	Radiological and Limited Chemical Characterization Report for the Hunter Douglas Property, Maywood, New Jersey DOE/OR/20722-152	Bechtel National, Inc.	July 1987
R-17	Radiological Characterization Report for the Municipal Property at J.K. Kennedy Park (Kennedy Drive), Lodi, New Jersey DOE/OR/20722-255	Bechtel National, Inc.	September 1989
R-18	Radiological Characterization Report for the Residential Property at 8 Hancock Street, Lodi, New Jersey DOE/OR/20722-241	Bechtel National, Inc.	September 1989
R-19	Post-Remedial Action Report for the Residential Properties on Grove Avenue and Parkway, Rochelle Park, New Jersey DOE/OR/20722-83	Bechtel National, Inc., Advanced Technology Division	March 1986
R-20	Post-Remedial Action Report for Lodi Residential Properties - 1985, Lodi, New Jersey DOE/OR/20722-89	Bechtel National, Inc., Advanced Technology	August 1986

LIST OF SITE DOCUMENTS REVIEWED BY THE AUDIT TEAM

DOCUMENT NUMBER	TITLE/DESCRIPTION	AUTHOR/ORGANIZATION/RECIPIENT	DOCUMENT DATE
R-21	Results of the Independent Radiological Verification Survey at 86 Park Way, Rochelle Park, New Jersey (NJ02L) ORNL/RASA-86/41	M.G. Yalcintas and C.A. Johnson, Oak Ridge National Laboratory	August 1986
R-22	Survey Plan for the Radiological Characterization of the Sears and Scanel Properties, Maywood, New Jersey DOE/OR/20722-81	Bechtel National, Inc., Advanced Technology Division	August 1985
R-23	Characterization Plan for Sears and Adjacent Properties, Maywood, New Jersey DOE/OR/20722-81 Revision 1	Bechtel National, Inc., Advanced Technology	July 1986
R-24	Environment, Safety, Health and Quality Assurance Audit of the Formerly Utilized Sites Remedial Action Program (FUSRAP) New Jersey and Missouri Sites FUSRAP Audit No. 56, August - September 1990	Bechtel National, Inc. - San Francisco	November 1, 1990
R-25	Formerly Utilized Sites Remedial Action Program Environmental Compliance Assessment Findings for Maywood Interim Storage Site, Wayne Interim Storage Site, and Middlesex Sampling Plant	C.F. Sigmon and M.B. Levine, Oak Ridge National Laboratory, Environmental Sciences Division	May 25, 1990
R-26	Calculation Sheet - FUSRAP-NESHAPS Calculation for MISS	S.L. Lue Phang, Bechtel National, Inc.	April 20, 1990
R-27	User's Guide for AIRDOS-PC, Version 3.0 EPA/520/6-89-035	U.S. Environmental Protection Agency	December 1989
R-28	Maywood Interim Storage Site Radon Flux Measurements	Bechtel National, Inc.	None
R-29	DOSE-RATE Factors for Body Organs and Effective Dose-Rate Factor for Exposure 1 m Above Contaminated Ground Surface in area/yr Microcurie/square m		None
R-30	Report of Analysis	TMA/Eberline	November 27, 1989
R-31	Residual Radioactivity Program Analyses Results		None
R-32	An Aerial Radiologic Survey of the Stepan Chemical Company and Surrounding Area, Maywood, New Jersey, Date of Survey January 26, 1981	EG&G Energy Measurements Group	April 1981
R-33	Clean Air Act Compliance Report (Version 3.0 November 1989)	Bechtel National, Inc.	April 20, 1990

LIST OF SITE DOCUMENTS REVIEWED BY THE AUDIT TEAM

DOCUMENT NUMBER	TITLE/DESCRIPTION	AUTHOR/ORGANIZATION/RECIPIENT	DOCUMENT DATE
R-34	Characterization Plan for Sears and Adjacent Properties, Maywood, New Jersey DOE/OR/20722-81 Revision 1	Bechtel National, Inc., Advanced Technology	July 1986
R-35	Characterization Plan for the Vicinity Properties in Lodi, Lodi, New Jersey DOE/OR/20722-120	Bechtel National, Inc.	January 1987
R-36	Characterization Plan for the Maywood Interim Storage Site, Maywood, New Jersey DOE/OR/20722-93	Bechtel National, Inc., Advanced Technology Division	May 1986
R-37	Interoffice Memorandum: Background Survey for Maywood and Maywood VP Activities	To: M. Redmon, Bechtel National, Inc. From: M. Bradshaw, Bechtel National, Inc.	October 10, 1990
R-38	State Background Radiation Levels: Results of Measurements Taken During 1975-1979 ORNL/TM-7343	J.E. Myrick, B.A. Berven and F.F. Haywood, Oak Ridge National Laboratory	November 1981
R-39	QA-12 TMA/Eberline Radon Flux Analytical Procedures Using Large Area Activated Charcoal Collectors (LAACC) (Draft)	TMA/Eberline, Health Physics Services	July 13, 1990
R-40	Health Physics Operational Procedures Manual Formerly Utilized Sites Remedial Action Program and Surplus Facilities Management Program	TMA/Eberline	October 1, 1989
R-41	SFMP Guidelines for Residual Radioactivity at FUSRAP and Remote SFMP Sites	C.E. Miller, Director, Surplus Facilities Management Program Office, U.S. Department of Energy	March 5, 1985
R-42	Memorandum, Disparities in Regulations Governing Radionuclides	To: S. Oldham, Oak Ridge Operations Office, TSD From: A. Wallo, III, Environmental Guidance Division	December 29, 1989
R-43	U.S. Department of Energy Guidelines for Residual Radioactivity at Formerly Utilized Sites Remedial Action Program and Remote Surplus Facilities Management Program Sites, Appendix B, Rev. 1)		July 1985
R-44	Maywood Interim Storage Site Annual Site Environmental Report, Maywood, New Jersey, Calendar Year 1988 DOE/OR/20722-216	Bechtel National, Inc.	April 1989

LIST OF SITE DOCUMENTS REVIEWED BY THE AUDIT TEAM

DOCUMENT NUMBER	TITLE/DESCRIPTION	AUTHOR/ORGANIZATION/RECIPIENT	DOCUMENT DATE
WM-1	Maywood Interim Storage Site Environmental Report for Calendar Year 1989	Bechtel National, Inc.	May 1990
WM-2	FUSRAP Program Environmental Compliance Assessment Findings	C.F. Sigmon/Oak Ridge National Laboratory	May 25, 1990
WM-3	ESH & QA Audit of FUSRAP New Jersey and Missouri	L.R. Martinez/Bechtel National, Inc. - San Francisco	November 1, 1990
WM-4	DOE-ORO ESH & QA Functional Appraisal of FUSRAP	U.S. Department of Energy - Oak Ridge Operations Office - AMESQ	June 1990
WM-5	Maywood Interim Storage Site IG for RCRA Waste Treatment - As Built	N. Ring/Bechtel National, Inc.	August 29, 1990
WM-6	Building 76 Drums Opened and pH Tested (BNI #D-05013)	N. Ring/Bechtel National, Inc.	October 18, 1989

LIST OF SITE DOCUMENTS REVIEWED BY THE AUDIT TEAM

DOCUMENT NUMBER	TITLE/DESCRIPTION	AUTHOR/ORGANIZATION/RECIPIENT	DOCUMENT DATE
QA-1	Environmental Protection Program Implementation Plan for FUSRAP	M. Kaye, T. Adler and D. Adler	November 13, 1989
QA-2	Quality Assurance Program Plan for FUSRAP	Bechtel National, Inc.	August 19, 1988
QA-3	FUSRAP Project Organization Chart	Bechtel National, Inc.	October 10, 1990
QA-4	Site Plan for Maywood, Maywood, New Jersey DOE/OR/20722-113	Bechtel National, Inc.	May 1989
QA-5	Maywood Interim Storage Site Annual Site Environmental Report - Maywood, New Jersey - Calendar Year 1985	Bechtel National, Inc.	May 1986
QA-6	Maywood Interim Storage Site Annual Site Environmental Report - Maywood, New Jersey - Calendar Year 1986	Bechtel National, Inc.	June 1987
QA-7	Maywood Interim Storage Site Annual Site Environmental Report - Maywood, New Jersey - Calendar Year 1987	Bechtel National, Inc.	April 1988
QA-8	Maywood Interim Storage Site Annual Site Environmental Report - Maywood, New Jersey - Calendar Year 1988	Bechtel National, Inc.	April 1989
QA-9	Maywood Interim Storage Site Annual Site Environmental Report - Maywood, New Jersey - Calendar Year 1990	Bechtel National, Inc.	May 1990
QA-10	Functional Appraisal of FUSRAP	DOE Environment, Safety, Health and Quality Assurance	June 1990
QA-11	DOE Order OR 5700.68	U.S. Department of Energy - Oak Ridge Operations	November 22, 1989
QA-12	Environment, Safety, Health and Quality Assurance Audit of FUSRAP New Jersey and Missouri Sites (FUSRAP Audit #56) August - September 1990	Bechtel National, Inc.	November 1, 1990
QA-13	QA Management Audit #M76	W.C. Borden to B. Hamilton	June 22, 1987
QA-14	Project Audit #46 TNA/Eberline	E. Sanchez to B. Hamilton	June 27, 1988
QA-15	QA Management Audit #81	B. Hamilton	September 20, 1988
QA-16	Project Audit #50	B. Hamilton to G. Hovey	July 7, 1989
QA-17	Management Audit #89-7	L. Martinez to L. Trautner	February 14, 1990
QA-18	Quality Assurance Department Procedure 1.6 - Audits	QA Department - Bechtel National, Inc.	August 1, 1990

LIST OF SITE DOCUMENTS REVIEWED BY THE AUDIT TEAM

DOCUMENT NUMBER	TITLE/DESCRIPTION	AUTHOR/ORGANIZATION/RECIPIENT	DOCUMENT DATE
QA-19	Quality Assurance Department Procedure 1.7 - Surveillance	QA Department - Bechtel National, Inc.	August 1, 1990
QA-20	Quality Assurance Department Procedure 1.8 - Corrective Action	QA Department - Bechtel National, Inc.	August 1, 1990
QA-21	Quality Assurance Department Procedure 1.13 - Trend Analysis	QA Department - Bechtel National, Inc.	August 1, 1990
QA-22	DOE Appraisal - CAR Action Report	FUSRAP Project	November 8, 1990
QA-23	Quality Assurance Department Procedure 1.2 - Planning and Scheduling	QA Department - Bechtel National, Inc.	August 1, 1990
QA-24	Audit #49 Weston Laboratory	B. Hamilton and M. Kaye	August 17, 1988
QA-25	Audit #52 Weston Laboratory	B. Hamilton and M. Kaye	September 20, 1989
QA-26	QA Management Review Meeting #105	FUSRAP Project	November 1, 1990
QA-27	Environmental Protection Division Surveillance Program	P.J. Gross	June 8, 1990
QA-28	Surveillance Procedure ENV-TP-1.6	U.S. Department of Energy - Oak Ridge Operations - Environmental Protection Division	November 1, 1990
QA-29	Functional Appraisal Manual	U.S. Department of Energy - Oak Ridge Operations	Draft
QA-30	Letter re: Lessons Learned	L.K. Price to G. Hovey	November 9, 1990
QA-31	Environmental Protection Appraisal - FUSRAP	U.S. Department of Energy - Oak Ridge Operations Office, EPD	September 12-16, 1988
QA-32	September QA Activities Report	R. Hamilton to G. Hovey	September 29, 1989
QA-33	PASP 2.21 - Distribution of Documents	FUSRAP Administrative Service	May 11, 1990
QA-34	FSRD/FUSRAP ESH&QA Self Assessment Program	L. Price, FSRD	November 8, 1990
QA-35	FUSRAP Environmental Compliance Assessment Findings (New Jersey Sites)	Environmental Science Division, Oak Ridge National Laboratory	May 25, 1990
QA-36	EH&S Surveillance Program Documents (Draft)	FUSRAP EH&S	October 29, 1990
QA-37	FUSRAP Audit and Surveillance Schedules 1989 - 1991	FUSRAP QA&EC	None

LIST OF SITE DOCUMENTS REVIEWED BY THE AUDIT TEAM

DOCUMENT NUMBER	TITLE/DESCRIPTION	AUTHOR/ORGANIZATION/RECIPIENT	DOCUMENT DATE
QA-38	Subcontract 14501-191-SC-205	Bechtel National, Inc. for Weston Laboratories	December 1989
QA-39	Laboratory Quality Assurance Manual	Roy F. Weston, Inc.	January 1989
QA-40	TMA/Eberline Quality Assurance Manual	Thermo Analytical, Inc.	January 1990
QA-41	FUSRAP Health Physics Operational Procedures Manual	Bechtel National, Inc. and TMA/Eberline	January 1989
QA-42	FUSRAP Integrated Environmental Monitoring Field Activities Instruction Guide	Formerly Utilized Sites Remedial Action Program	October 5, 1990
QA-43	Field Sampling Plan for the RI/FS - Environmental Impact Statement for the Maywood Site	Bechtel National, Inc.	June 1990
QA-44	Quality Assurance Project Plan for the RI/FS - Environmental Impact Statement for the Maywood Site	Bechtel National, Inc.	June 1990

LIST OF SITE DOCUMENTS REVIEWED BY THE AUDIT TEAM

DOCUMENT NUMBER	TITLE/DESCRIPTION	AUTHOR/ORGANIZATION/RECIPIENT	DOCUMENT DATE
IWS-1	Work Plan for the Remedial Investigation/Feasibility Study (RI/FS)- Environmental Impact Statement (EIS) for the Maywood Site	Argonne National Laboratory/U.S. Department of Energy - Oak Ridge Operations Office	July 1990
IWS-2	Field Sampling Plan for the RI/FS - EIS for the Maywood Interim Storage Site	Bechtel National, Inc./U.S. Department of Energy - Oak Ridge Operations Office	June 1990
IWS-3	Field Sampling Plan for the RI/FS - EIS for the Maywood Site	Bechtel National, Inc./U.S. Department of Energy - Oak Ridge Operations Office	June 1990
IWS-4	Quality Assurance Project Plan for the RI/FS - EIS for the Maywood Site	Bechtel National, Inc./U.S. Department of Energy - Oak Ridge Operations Office	June 1990
IWS-5	U.S. Environmental Protection Agency Comment Package on the RI/FS - EIS planning documents	Letter to B. Atkin from K. Stone U.S. Environmental Protection Agency/U.S. Department of Energy - Oak Ridge Operations Office	May 1, 1990
IWS-6	Federal Facility Agreement for the Maywood Site Authorization letter from L. Duffy to J. LaGrone	U.S. Environmental Protection Agency and U.S. Department of Energy/U.S. Department of Energy - Oak Ridge Operations Office	July 11, 1990
IWS-7	Site Plan for Maywood	Bechtel National, Inc./U.S. Department of Energy - Oak Ridge Operations Office	May 1989
IWS-8	FUSRAP Environmental Compliance Assessment Findings Maywood Interim Storage Site	C.F. Sigmon and M.B. Levine - Oak Ridge National Laboratory/U.S. Department of Energy - Oak Ridge Operations Office	May 25, 1990
IWS-9	Characterization Report for the Maywood Interim Storage Site	Bechtel National, Inc./U.S. Department of Energy - Oak Ridge Operations Office	June 1987
IWS-10	Health and Safety Plan for the Formerly Utilized Sites Remedial Action Program	Bechtel National, Inc./U.S. Department of Energy - Oak Ridge Operations Office	April 1989
IWS-11	Health and Safety Plan for the RI/FS - EIS for the Maywood Site	Bechtel National, Inc./U.S. Department of Energy - Oak Ridge Operations Office	June 1990
IWS-12	Project Instruction 24.064, "Energy Response and Notification Planning" Rev 2	Bechtel National, Inc.	July 7, 1989
IWS-13	Environmental Protection Program Implementation Plan for FUSRAP	Bechtel National, Inc./U.S. Department of Energy - Oak Ridge Operations Office	November 13, 1989
IWS-14	FUSRAP Designation/Elimination Protocol Supplement No. 1 to the FUSRAP Summary Protocol	U.S. Department of Energy, Division of Facility and Site Decontamination Projects	January 1986

LIST OF SITE DOCUMENTS REVIEWED BY THE AUDIT TEAM

DOCUMENT NUMBER	TITLE/DESCRIPTION	AUTHOR/ORGANIZATION/RECIPIENT	DOCUMENT DATE
IUS-15	FUSRAP Verification and Certification Protocol Supplement No. 2 to the FUSRAP Summary Protocol	U.S. Department of Energy, Division of Facility and Site Decommissioning Projects Rev. 1	November 1985
IUS-16	Community Relations Plan for the RI/FS - EIS for the Maywood Site	Bechtel National, Inc./U.S. Department of Energy - Oak Ridge Operations Office	June 1990
IUS-17	Administrative Record for the Maywood Site	Bechtel National, Inc./U.S. Department of Energy - Oak Ridge Operations Office	September 15, 1989
IUS-18	Federal Facility Agreement Correspondence File	Bechtel National, Inc.	1989 to Present
IUS-19	DOE Memorandum - Chemical Contamination of FUSRAP Sites	To: Peter Gross, U.S. Department of Energy - Oak Ridge Operations Office From: James Fiore, U.S. Department of Energy - Headquarters	August 24, 1989
IUS-20	FUSRAP Integrated Environmental Monitoring Field Activities Instruction Guide	Bechtel National, Inc.	October 1, 1990
IUS-21	Maywood Interim Storage Site Environmental Monitoring Summary, Maywood, New Jersey - Calendar Year 1984 DOE/OR/20722-60	Bechtel National, Inc.	March 1985
IUS-22	Maywood Interim Storage Site Annual Site Environmental Report, Maywood, New Jersey - Calendar Year 1985 DOE/OR/20722-96	Bechtel National, Inc.	May 1986
IUS-23	Maywood Interim Storage Site Annual Site Environmental Report, Maywood, New Jersey - Calendar Year 1986 DOE/OR/20722-148	Bechtel National, Inc.	June 1987
IUS-24	Maywood Interim Storage Site Annual Site Environmental Report, Maywood, New Jersey - Calendar Year 1987 DOE/OR/20722-195	Bechtel National, Inc.	April 1988
IUS-25	Maywood Interim Storage Site Environmental Report for Calendar Year 1989, Maywood, New Jersey DOE/OR/20722-267 (Draft)	Bechtel National, Inc.	April 1990
IUS-26	Maywood Interim Storage Site Annual Site Environmental Report, Maywood, New Jersey - Calendar Year 1988 DOE/OR/20722-216	Bechtel National, Inc.	April 1989

LIST OF SITE DOCUMENTS REVIEWED BY THE AUDIT TEAM

DOCUMENT NUMBER	TITLE/DESCRIPTION	AUTHOR/ORGANIZATION/RECIPIENT	DOCUMENT DATE
IWS-27	Certification Docket for the Remedial Action Performed at Properties in Maywood, Rochelle Park, and Lodi, New Jersey in 1984 and 1985	U.S. Department of Energy, Oak Ridge Operations Office, Technical Services Division	December 1988
IWS-28	Concurrence to Start Remedial Investigation Without Published Planning Documents	Letter to B. Atkin, U.S. Department of Energy Site Manager from R.C. Robertson, Bechtel National, Inc. Project Manager	August 27, 1990

LIST OF SITE DOCUMENTS REVIEWED BY THE AUDIT TEAM

DOCUMENT NUMBER	TITLE/DESCRIPTION	AUTHOR/ORGANIZATION/RECIPIENT	DOCUMENT DATE
MGT-1	FSRD/FUSRAP ESH&QA Self Assessment Program	L. Price, FSRD	November 8, 1990
MGT-2	Draft Model Program Charter for ORO Line Management Self Assessment	R. Nelson, AM-ESQ	October 31, 1990
MGT-3	FUSRAP Program Environmental Compliance Assessment Findings	C.F. Sigmon, Oak Ridge National Laboratory	May 25, 1990
MGT-4	ESH&QA Audit of FUSRAP New Jersey and Missouri	L.R. Martinez, Bechtel National, Inc. - San Francisco	November 1, 1990
MGT-5	DOE-ORO ESH&QA Functional Appraisal of FUSRAP	U.S. Department of Energy, Oak Ridge Operations Office, ANESQ	June 1990
MGT-6	BNI - Quality Assurance Department Program Procedures 1.6, 1.7, 1.8, and 1.13	Bechtel National, Inc., Quality Assurance Department	August 1, 1990
MGT-7	FUSRAP Project Procedure 1.3 Environmental Compliance Assessments, Surveillances, and Audits	Bechtel National, Inc., Quality Assurance	October 31, 1990
MGT-8	Cost and Schedule Control System Criteria for Contract Performance Measurement DOE/NA-0229	C.M. Mitchell, Director, Office of Project and Facilities Management	June 1986
MGT-9	Environmental Safety and Health Appraisal Program DOE 5482.18	Assistant Secretary for Environmental Safety and Health	September 23, 1986
MGT-10	Environmental Protection Safety and Health Protection Information Reporting Requirements DOE OR 5484.1	Safety and Environmental Control Division	May 5, 1982
MGT-11	Environmental Protection Safety and Health Protection Program for DOE Facilities DOE 5480.1A	Assistant Secretary for Environmental Protection Safety and Emergency Preparedness	August 13, 1981
MGT-12	Conduct of Operations Requirements for DOE Facilities DOE 5480.19	Office of Nuclear Facilities	July 9, 1990
MGT-13	FUSRAP Integrated Environmental Monitoring Field Activities Instruction Guide 14501-191-00-1G-03	Bechtel National, Inc.	October 5, 1990
MGT-14	Environmental Protection Program Implementation Plan for FUSRAP NA.744-n1	G.K. Hovey, Program Manager	November 13, 1989

LIST OF SITE DOCUMENTS REVIEWED BY THE AUDIT TEAM

DOCUMENT NUMBER	TITLE/DESCRIPTION	AUTHOR/ORGANIZATION/RECIPIENT	DOCUMENT DATE
MGT-15	Maywood Interim Storage Site Environmental Monitoring Summary DOE/OR/20722-60	Bechtel National, Inc.	July 1985
MGT-16	Maywood Interim Storage Site Environmental Monitoring Summary DOE/OR/20722-96	Bechtel National, Inc.	May 1986
MGT-17	Maywood Interim Storage Site Environmental Monitoring Summary DOE/OR/20722-148	Bechtel National, Inc.	June 1987
MGT-18	Maywood Interim Storage Site Environmental Monitoring Summary DOE/OR/20722-195	Bechtel National, Inc.	April 1988
MGT-19	Maywood Interim Storage Site Environmental Monitoring Summary DOE/OR/20722-216	Bechtel National, Inc.	April 1989
MGT-20	Characterization Plan for Sears and Adjacent Properties DOE/OR/20722-81	Bechtel National, Inc.	July 1986
MGT-21	Environmental Monitoring Plan for the Maywood Site DOE/OR/20722-25	Bechtel National, Inc.	September 1984
MGT-22	Characterization Report for Maywood Interim Storage Site 20722-139	Bechtel National, Inc.	June 1987
MGT-23	Quality Assurance Management Audit #M76	W.C. Borden, FUSRAP Project	June 7, 1987
MGT-24	FUSRAP Project Organization as of October 1990 and Site Responsibilities 071945	S. Wright	October 10, 1990
MGT-25	COTR Summary Appraisal of BNI for Fiscal Year 1988	P.J. Gross, Director, Technical Services	February 2, 1989
MGT-26	COTR Summary Appraisal of BNI for Fiscal Year 1989	L. Price, Director, Technical Services	February 15, 1990
MGT-27	Environmental Compliance Assessment Findings for MISS, WISS, and MSP 90-293	R.G. Atkin, Site Manager, U.S. Department of Energy	June 22, 1990

LIST OF SITE DOCUMENTS REVIEWED BY THE AUDIT TEAM

DOCUMENT NUMBER	TITLE/DESCRIPTION	AUTHOR/ORGANIZATION/RECIPIENT	DOCUMENT DATE
MGT-28	COTR Summary Appraisal of BNI for Last Half of Fiscal Year 1987 048686	S.W. Ahrends, Director, TSD	October 19, 1987
MGT-29	COTR Summary Appraisal of BNI for First Half of Fiscal Year 1987 044315	S.W. Ahrends, Director, TSD	April 2, 1987
MGT-30	FUSRAP SEN-7 Reports: January 1990, March 1990, June 1990, July 1990, August 1990, and September 1990	U.S. Department of Energy	

APPENDIX D
LIST OF CONTACTS/INTERVIEWS PERFORMED BY THE AUDIT TEAM

LIST OF CONTACTS/INTERVIEWS PERFORMED BY THE AUDIT TEAM

REFERENCE NUMBER	DATE	AUDITOR	ORGANIZATION	POSITION	TOPIC
I-TL-1	11/12/90	L. Stevens	Bechtel National, Inc.	Environmental Compliance	Waste Minimization Plan Groundwater Protection Management Plan
I-TL-2	11/13/90	L. Stevens	U.S. Department of Energy Headquarters	FUSRAP Program Manager	Applicability/compliance with DOE Orders
I-TL-3	11/2/90	L. Stevens	U.S. Department of Energy Headquarters	FUSRAP Manager	FUSRAP Procedures
I-TL-4	11/7/90	L. Stevens	New Jersey Department of Environmental Protection	Health Physicist	Maywood Concerns
I-TL-5	11/7/90	L. Stevens	U.S. Environmental Protection Agency, Region II	Environmental Protection Environmental Protection	Maywood Concerns

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REFERENCE NUMBER	DATE	AUDITOR	ORGANIZATION	POSITION	TOPIC
I-ATL-1	11/9/90	W. Eckroade	Bechtel National, Inc.	FUSRAP Project QA Supervisor	Self-Assessment
				QA Manager Oak Ridge Projects	
				QA Supervisor FUSRAP	
I-ATL-2	11/9/90	W. Eckroade	U.S. Department of Energy - ESG	QA Engineer	QA Audits
				QA Engineer	
I-ATL-3	11/9/90	W. Eckroade	Bechtel National, Inc.	Maywood Project Manager	Waste Management
				Senior Engineer	
				EM&S Team Supervisor	
I-ATL-4	11/9/90	W. Eckroade	U.S. Department of Energy - ESG	Chief, Environmental Remediation Branch	Environmental Appraisals
				Health Physicist	
I-ATL-5	11/12/90	W. Eckroade	U.S. Department of Energy - Oak Ridge Operations Office - FUSRAP	Director, FSRD	Line Management Self-Assessment

LIST OF CONTACTS/INTERVIEWS PERFORMED BY THE AUDIT TEAM

REFERENCE NUMBER	DATE	AUDITOR	ORGANIZATION	POSITION	TOPIC
I-A-1	11/9/90	D. Nugent	Bechtel National, Inc.	Environmental Monitoring Coordinator	Monitoring Design Criteria Monitoring Site Relocation Monitoring Network Review
I-A-2	11/9/90	D. Nugent	Bechtel National, Inc.	Team Leader, Environmental Health & Safety, New Jersey Sites Team Leader, Environmental Health & Safety, New York Sites Environmental Health & Safety Supervisor	Monitoring Design Criteria Monitoring Site Relocation Monitoring Network Review
I-A-3	11/9/90	D. Nugent	Bechtel National, Inc.	Team Leader, Environmental Health & Safety, New York Sites	AIRDOSE Assessment
I-A-4	11/9/90	D. Nugent	Bechtel National, Inc.	Former Environmental Monitoring Coordinator	Monitoring Design Criteria Monitoring Site Relocation Monitoring Network Review
I-A-5	11/10/90	D. Nugent	Bechtel National, Inc.	Senior Engineer Supervisor, Environmental Compliance and Monitoring Assistant Supervisor, Environmental Health & Safety	Regulatory Applicability of 40 CFR Parts 61 and 192
I-A-6	11/10/90	D. Nugent	Bechtel National, Inc.	Team Leader, Environmental Health & Safety, New Jersey Sites	Radon monitoring chain-of-custody
I-A-7	11/11/90	D. Nugent	Bechtel National, Inc.	Team Leader, Environmental Health & Safety, New Jersey Sites	Personnel training Sample Exchange Procedure Site Inspections
I-A-8	11/11/90	D. Nugent	Bechtel National, Inc.	Environmental Monitoring Coordinator	Personnel training Sample Exchange Procedure Site Inspections

LIST OF CONTACTS/INTERVIEWS PERFORMED BY THE AUDIT TEAM

REFERENCE NUMBER	DATE	AUDITOR	ORGANIZATION	POSITION	TOPIC
I-A-9	11/11/90	D. Nugent	Bechtel National, Inc.	Environmental Monitoring Coordinator	Sample handling Site inspections Site #2 location
I-A-10	11/7/90	D. Nugent	Bechtel National, Inc.	Team Leader, Environmental Health & Safety, New Jersey Sites	On-Site asbestos
				Team Leader, Environmental Health & Safety, New York Sites	
				Environmental Health & Safety Supervisor	

LIST OF CONTACTS/INTERVIEWS PERFORMED BY THE AUDIT TEAM

REFERENCE NUMBER	DATE	AUDITOR	ORGANIZATION	POSITION	TOPIC
I-SW-1	11/7/90	K. Turnbull	Bechtel National, Inc. - ES&H	New Jersey Sites - Group Supervisor	Lodi vicinity properties; former Lodi Brook Channel
I-SW-2	11/7/90	K. Turnbull	Bechtel National, Inc. - ES&H	Technical Support Group Supervisor	Former Lodi Brook Channel
I-SW-3	11/7/90	K. Turnbull	Bechtel National, Inc. - ES&H	Technical Support Group Supervisor	Environmental Monitoring of Surface Water and Sediment
I-SW-4	11/7/90	K. Turnbull	TMA/Eberline	Sampling Technician	
I-SW-5	11/7/90	K. Turnbull	Bechtel National, Inc. - ES&H	Technical Support Group Supervisor	Lodi Brook Outcrops and Sampling
I-SW-6	11/8/90	K. Turnbull	Bechtel National, Inc. - QA and Environmental Compliance	Environmental Compliance Specialist	Need for Stormwater discharge permit
I-SW-7	11/8/90	K. Turnbull	Bechtel National, Inc. - QA and Environmental Compliance	Geotechnical Group Supervisor	Site Drainage Characteristics; sampling of stormwater runoff; smoke testing of underground sewers/pipes
I-SW-8	11/8/90	K. Turnbull	Bechtel National, Inc. - QA and Environmental Compliance	Environmental Compliance Specialist	Correspondence with NJDEP concerning need for stormwater discharge permit
I-SW-9	11/9/90	K. Turnbull	Bechtel National, Inc. - ES&H	New Jersey Sites - Group Supervisor	Written sampling procedures
I-SW-10	11/9/90	K. Turnbull	Bechtel National, Inc. - ES&H	Supervisor Assistant Supervisor	Remedial investigation planning document preparation and review; environmental monitoring report review; RI/FS process for FUSRAP
				New York Sites - Group Supervisor	Contaminant migration pathways; sampling; data validation and QA; rationale for sampling locations

LIST OF CONTACTS/INTERVIEWS PERFORMED BY THE AUDIT TEAM

REFERENCE NUMBER	DATE	AUDITOR	ORGANIZATION	POSITION	TOPIC
I-SU-11	11/9/90	K. Turnbull	Bechtel National, Inc.	New Jersey Sites - Project Manager	FUSRAP organization; Maywood site team organization; RI planning and document review; EPA & NJDEP involvement at Maywood site; past NJPDES permit; RI/FS project schedule; RI activities; environmental monitoring program; FS process
I-SU-12	11/9/90	K. Turnbull	Bechtel National, Inc. - ES&H Bechtel National, Inc. - ES&H	New Jersey Sites - Group Supervisor New Jersey Sites Staff	Environmental monitoring sample location rationale; sampling crew training; smoke testing of underground piping; contaminant migration pathways; sampling of stormwater runoff; leachate and decon water collection and disposal; flood issues; spill controls
I-SU-13	11/9/90	K. Turnbull	Bechtel National, Inc. - Operations	Operations Coordinator for New Jersey and New York Sites	Site inspections; leachate and decon water collection and disposal
I-SU-14	11/9/90	K. Turnbull	Bechtel National, Inc. - Operations	Former Operations Coordinator for New Jersey and New York Sites	Leachate and decon water handling and disposal
I-SU-15	11/9/90	K. Turnbull	Bechtel National, Inc. - Engineering Bechtel National, Inc. - Engineering Bechtel National, Inc. - Engineering	Geotechnical Group Supervisor New Jersey Sites Engineer Project Engineer	Smoke testings of underground piping; sampling of stormwater runoff; site drainage; site location with respect to floodplain; location of underground piping; groundwater infiltration into Westerly Brook beneath site
I-SU-16	11/9/90	K. Turnbull	Bechtel National, Inc. - ES&H	New Jersey Sites - Group Supervisor	Chemical characterization of Westerly Brook downstream of site
I-SU-17	11/11/90	K. Turnbull	Bechtel National, Inc. - QA and Environmental Compliance Bechtel National, Inc. - ES&H	Environmental Compliance Specialist Environmental & Technical Support Supervisor	Regulatory compliance during RI/FS, routine environmental monitoring, and FUSRAP process

LIST OF CONTACTS/INTERVIEWS PERFORMED BY THE AUDIT TEAM

REFERENCE NUMBER	DATE	AUDITOR	ORGANIZATION	POSITION	TOPIC
I-SU-18	11/11/90	K. Turnbull	Bechtel National, Inc. - ES&H	New Jersey Sites - Group Supervisor	RI/FS - EIS Work Plan and Field Sampling Plan; Environmental Monitoring locations
			Bechtel National, Inc. - ES&H	Technical Support Group Supervisor	
I-SU-19	11/12/90	K. Turnbull	Bechtel National, Inc. - ES&H	New Jersey Sites Staff	Sampling of Lodi Brook for environmental monitoring

LIST OF CONTACTS/INTERVIEWS PERFORMED BY THE AUDIT TEAM

REFERENCE NUMBER	DATE	AUDITOR	ORGANIZATION	POSITION	TOPIC
I-GW-1	10/16/90	P. Winsborough	Bechtel National, Inc.	New Jersey Team Leader	Quarterly Groundwater Sampling
I-GW-2	10/16/90	P. Winsborough	Bechtel National, Inc.	Site Health and Safety Officer	Quarterly Groundwater Sampling
I-GW-3	10/16/90	P. Winsborough	Bechtel National, Inc.	Weston Contract Administration	Quarterly Groundwater Sampling
I-GW-4	10/16/90	P. Winsborough	Bechtel National, Inc.	EH&S New Jersey Team	Quarterly Groundwater Sampling
I-GW-5	10/16/90	P. Winsborough	Eberline	Health Physics Technician	Quarterly Groundwater Sampling
I-GW-6	10/16/90	P. Winsborough	Bechtel National, Inc.	EH&S Environmental Group	Quarterly Groundwater Sampling
I-GW-7	11/7/90	P. Winsborough	Bechtel National, Inc.	New Jersey Project Manager	Site Briefing
I-GW-8	11/7/90	P. Winsborough	Bechtel National, Inc.	Geotech-hydro Supervisor	Site groundwater monitoring
I-GW-9	11/7/90	P. Winsborough	Bechtel National, Inc.	Environmental Compliance	Site groundwater monitoring
I-GW-10	11/9/90	P. Winsborough	Bechtel National, Inc.	Assistant Supervisor	Site groundwater monitoring program
I-GW-11	11/9/90	P. Winsborough	Bechtel National, Inc.	EH&S Supervisor	Groundwater Monitoring Program
I-GW-12	11/9/90	P. Winsborough	Bechtel National, Inc.	New York Team Supervisor	Groundwater Monitoring Program
I-GW-13	11/9/90	P. Winsborough	Bechtel National, Inc.	Project Manager	Groundwater Monitoring Program
I-GW-14	11/9/90	P. Winsborough	Bechtel National, Inc.	EH&S New Jersey Team	Groundwater Monitoring Program
I-GW-15	11/9/90	P. Winsborough	Bechtel National, Inc.	Operations Department Supervisor	Wastewater Disposal
I-GW-16	11/9/90	P. Winsborough	Bechtel National, Inc.	Geotech-hydro Supervisor	Groundwater Monitoring Program
I-GW-17	11/9/90	P. Winsborough	Bechtel National, Inc.	Project Engineer, New Jersey Sites	Groundwater Monitoring Program
I-GW-18	11/9/90	P. Winsborough	Bechtel National, Inc.	Engineer, New Jersey Sites	Groundwater Monitoring Program
I-GW-19	11/11/90	P. Winsborough	Bechtel National, Inc.	Environmental Compliance	Groundwater Monitoring Program

LIST OF CONTACTS/INTERVIEWS PERFORMED BY THE AUDIT TEAM

REFERENCE NUMBER	DATE	AUDITOR	ORGANIZATION	POSITION	TOPIC
I-GW-20	11/13/90	P. Winsborough	Bechtel National, Inc.	Quality Assurance Supervisor	Groundwater Monitoring Program

LIST OF CONTACTS/INTERVIEWS PERFORMED BY THE AUDIT TEAM

REFERENCE NUMBER	DATE	AUDITOR	ORGANIZATION	POSITION	TOPIC
I-R-1	11/7/90	M. Francis	Bechtel National, Inc.	Technical Support Group Supervisor	Vicinity property visits
I-R-2 *	11/7/90	M. Francis	U.S. Department of Energy	Site Manager	
			TNA/Eberline	Sampling Technician	Environmental monitoring of surface water and sediment
I-R-3	11/7/90	M. Francis	TNA/Eberline	Field Technician	Walkover survey crew
I-R-4	11/8/90	M. Francis	TNA/Eberline	Field Supervisor	Procedure requirements for developing radiation survey data
I-R-5	11/8/90	M. Francis	State of New Jersey Department of Environmental Protection, Bureau of Environmental Radiation	Supervisor, Radiological Environmental Assessment Section	Discussion of DOE Audit techniques, observations to date, and request for any issues or concerns posed by the State of New Jersey
I-R-6	11/9/90	M. Francis	Bechtel National, Inc.	New Jersey Sites Group Supervisor	Dose assessment, pathway analyses, TETLDs
I-R-7	11/9/90	M. Francis	Bechtel National, Inc.	Asst. ENES Supervisor	ALARA Program
I-R-8	11/9/90	M. Francis	Bechtel National, Inc.	Former Environmental HP responsible for Environmental Monitoring	Original siting criteria for radon monitors and TETLDs
I-R-9	11/10/90	M. Francis	Bechtel National, Inc.	Environmental Regulations Specialist	NESHAPS compliance issues
I-R-10	11/11/90	M. Francis	Bechtel National, Inc.	New Jersey Group Supervisor	Site characterization
I-R-11	11/11/90	M. Francis	Bechtel National, Inc.	Environmental Regulatory Specialist	AIRDOs
I-R-12	11/13/90	M. Francis	U.S. Department of Energy Headquarters	Unit Chief, Environmental Radiation Division of Air Water Radiation	DOE Residual Radioactivity Guidelines and Vicinity Properties Issues

LIST OF CONTACTS/INTERVIEWS PERFORMED BY THE AUDIT TEAM

REFERENCE NUMBER	DATE	AUDITOR	ORGANIZATION	POSITION	TOPIC
I-TCH-1	11/7/90	M. Notich	Bechtel National, Inc.	New Jersey Sites Group Supervisor	Asbestos Waste Management

LIST OF CONTACTS/INTERVIEWS PERFORMED BY THE AUDIT TEAM

REFERENCE NUMBER	DATE	AUDITOR	ORGANIZATION	POSITION	TOPIC
I-QA-1	11/9/90	D. Wunsch	FUSRAP - Quality Assurance and Environmental Compliance Group	QA Supervisor QA Manager	FUSRAP QA Program and Project Oversight
I-QA-2	11/9/90	D. Wunsch	DOE - Quality and Reliability Division	QA Manager (OR Projects) QA Engineer	DOE oversight of FUSRAP QA Program
I-QA-3	11/9/90	D. Wunsch	FUSRAP EH&S Group	QA Engineer	QA requirements and oversight on subcontractor
I-QA-4	11/9/90	D. Wunsch	DOE - Environmental Division	Subcontract Coordinator Health Physicist	DOE FUSRAP oversight
I-QA-5	11/10/90	D. Wunsch	FUSRAP EH&S Group	Chief-Environmental Remediation Branch EH&S Supervisor	FUSRAP EH&S QA Activities and Procedures
I-QA-6	11/10/90	D. Wunsch	FUSRAP Project	EH&S Assistant Supervisor Project Manager, New Jersey Sites	QA responsibilities and activities
I-QA-7	11/11/90	D. Wunsch	FUSRAP Project	Project Administration	Document control
I-QA-8	11/12/90	D. Wunsch	FUSRAP EH&S Group	Group Supervisor, New Jersey Sites Environmental Monitoring Coordinator, New Jersey Sites	QA for Maywood activities (laboratory and field)
I-QA-9	11/12/90	D. Wunsch	DOE-ORO-FSRD	Group Supervisor, New York Sites Director	DOE project oversight

LIST OF CONTACTS/INTERVIEWS PERFORMED BY THE AUDIT TEAM

REFERENCE NUMBER	DATE	AUDITOR	ORGANIZATION	POSITION	TOPIC
I-IWS-1	11/1/90	J. McCann	U.S. Department of Energy Headquarters FUSRAP	Program Manager	FUSRAP Management Maywood Site and vicinity properties management and designation
I-IWS-2	11/1/90	J. McCann	U.S. Department of Energy Headquarters FUSRAP		FUSRAP Management Maywood Site and vicinity properties management and designation
I-IWS-3	11/7/90	J. McCann	Bechtel National, Inc.	Project Manager, New Jersey Sites	Site Tour
I-IWS-4	11/7/90	J. McCann	U.S. Department of Energy - Oak Ridge Operations Office Former Sites Restoration Division	Site Manager	Site Tour
I-IWS-5	11/7/90	J. McCann	Bechtel National, Inc.	Technical Lead	Site Tour
I-IWS-6	11/7/90	J. McCann	Eberline	Technical Support	Site Tour
I-IWS-7	11/7/90	J. McCann	Bechtel National, Inc.	Hydrogeologist	Site Tour
I-IWS-8	11/7/90	J. McCann	Bechtel National, Inc.	QA & Environmental Compliance	Site Tour
I-IWS-9	11/7/90	J. McCann	Bechtel National, Inc.	Environmental Compliance Expert	Site Tour
I-IWS-10	11/7/90	J. McCann	Bechtel National, Inc.	Team Leader, EH&S	Site Tour
I-IWS-11	11/7/90	J. McCann	Bechtel National, Inc.	Health and Safety	Site Health and Safety
I-IWS-12	11/7/90	J. McCann	Bechtel National, Inc.	Project Manager	Vicinity Properties Tour
I-IWS-13	11/7/90	J. McCann	Bechtel National, Inc.	Team Leader, EH&S	Stepan property tour
I-IWS-14	11/7/90	J. McCann	Alliance Technologies Corporation	Hydrogeologist	EPA oversight Maywood Remedial Investigation
I-IWS-15	11/7/90	J. McCann	U.S. Environmental Protection Agency Region II, Federal Activities Section	Chief	EPA involvement in Maywood Project
I-IWS-16	11/7/90	J. McCann	Bechtel National, Inc.	Geologist	Boring No. 228 Procedures

LIST OF CONTACTS/INTERVIEWS PERFORMED BY THE AUDIT TEAM

REFERENCE NUMBER	DATE	AUDITOR	ORGANIZATION	POSITION	TOPIC
I-IWS-17	11/7/90	J. McCann	Stepan Company	Plant Manager	Stepan Remedial Investigation Interaction with Maywood Site
I-IWS-18	11/7/90	J. McCann	U.S. Department of Energy - Oak Ridge Operations Office Former Sites Restoration Division	Site Manager	Maywood Site Administrative Record
I-IWS-19	11/8/90	J. McCann	Bechtel National, Inc.	Project Manager	Maywood Federal Facilities Agreement
I-IWS-20	11/8/90	J. McCann	U.S. Department of Energy - Oak Ridge Operations Office Former Sites Restoration Division	Site Manager	Maywood Federal Facilities Agreement
I-IWS-21	11/8/90	J. McCann	Bechtel National, Inc.	Field Engineer	Maywood Site Management Daily and Monthly Reports
I-IWS-22	11/8/90	J. McCann	New Jersey Department of Environmental Protection, Bureau of Radiation	Supervisor	State involvement with Maywood Site
I-IWS-23	11/9/90	J. McCann	U.S. Department of Energy - Oak Ridge Operations Office Former Sites Restoration Division	Site Manager	Maywood Site Management, FFA, CERCLA issues
I-IWS-24	11/9/90	J. McCann	U.S. Department of Energy - Oak Ridge Operations Office Former Sites Restoration Division	Site Manager	Maywood Site Management, FFA, CERCLA issues
I-IWS-25	11/9/90	J. McCann	U.S. Department of Energy - Oak Ridge Operations Office Former Sites Restoration Division	Director	Maywood Site Management, FFA, CERCLA issues
I-IWS-26	11/9/90	J. McCann	Bechtel National, Inc.	Environmental Compliance Expert	Maywood Site Management Compliance Issues
I-IWS-27	11/9/90	J. McCann	Bechtel National, Inc.	Regulatory Specialist	Maywood Site Management Compliance Issues

LIST OF CONTACTS/INTERVIEWS PERFORMED BY THE AUDIT TEAM

REFERENCE NUMBER	DATE	AUDITOR	ORGANIZATION	POSITION	TOPIC
I-IWS-28	11/9/90	J. McCann	Bechtel National, Inc., Safety and Health	Supervisor	Maywood Site Health and Safety
I-IWS-29	11/9/90	J. McCann	Bechtel National, Inc., Safety and Health	Health Physicist	Maywood Site Health and Safety
I-IWS-30	11/9/90	J. McCann	Bechtel National, Inc.	Technical Lead	Maywood Remedial Investigation
I-IWS-31	11/9/90	J. McCann	Bechtel National, Inc.	Team Leader, EH&S	Maywood Site Remedial Investigation
I-IWS-32	11/10/90	J. McCann	Bechtel National, Inc.	Team Leader, EH&S	Maywood Site Remedial Investigation
I-IWS-33	11/10/90	J. McCann	Bechtel National, Inc.	Project Manager	Maywood Site Remedial Investigation
I-IWS-34	11/11/90	J. McCann	Bechtel National, Inc.	Project Cost Engineer	R1/FS Cost Accounting and Funding
I-IWS-35	11/13/90	J. McCann	Bechtel National, Inc.	Project Manager	Weekly Project Review Meeting Monthly Cost and Schedule Control Meeting
I-IWS-36	11/13/90	J. McCann	New Jersey Department of Environmental Protection	Assistant Director, Remedial Planning and Design	Natural Resource Trustee Responsibilities

APPENDIX E
LIST OF ACRONYMS

List of Acronyms

AEC	Atomic Energy Commission
ALARA	as low as reasonably achievable
ARAR	applicable, or relevant and appropriate requirements
ASER	Annual Site Environmental Report
BMP	best management practice
BNI	Bechtel National, Inc.
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
cm	centimeters
COC	chain of custody
CRP	Community Relations Plan
CWA	Clean Water Act
DOE	U.S. Department of Energy
DOE-OR	U.S. Department of Energy-Oak Ridge Operations Office
EIS	Environmental Impact Statement
EMP	Environmental Monitoring Plan
EPA	U.S. Environmental Protection Agency
EWR	Newark International Airport
FELs	Field Exchange Logs
FFA	Federal Facility Agreement
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FS	Feasibility Study
FSRD	Former Sites Remediation Division
FUSRAP	Formerly Utilized Sites Remedial Action Program
IG	FUSRAP Integrated Environmental Field Activities Instruction Guide
in	inch(es)
km	kilometer(s)
LCD	local climatological data
m	meter(s)
MCLs	Maximum Concentration Limits
MCW	Maywood Chemical Works
MED	Manhattan Engineer District
mi	mile(s)
MISS	Maywood Interim Storage Site
mph	mile(s) per hour
MRPM	Management Requirements and Policy Manual
NCP	National Oil and Hazardous Substances Pollution Contingency Plan (Also Known as the National Contingency Plan)
NEPA	National Environmental Policy Act

List of Acronyms

NESHAP	National Emission Standards for Hazardous Air Pollutants
NJAC	New Jersey Administrative Code
NJDEP	New Jersey Department of Environmental Protection
NJPDES	New Jersey Pollutant Discharge Elimination System
NOI	Notice of Intent
NPL	National Priorities List
NRC	Nuclear Regulatory Commission
PCB	polychlorinated biphenyl
PVC	polyvinyl chloride
QA	quality assurance
QA&EC	Quality Assurance and Environmental Compliance
QAPP	Quality Assurance Program Plan
QA&RP	Quality Assurance and Reliability Division
QC	quality control
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
Rn-220	radon-220
Rn-222	radon-222
SARA	Superfund Amendments and Reauthorization Act
SEN	Secretary of Energy Notice
TCLP	Toxicity Characteristic Leaching Procedure
TETLDs	Tissue Equivalent Thermoluminescent Dosimeters
TOC	total organic carbon
TOH	total organic halogen
TSCA	Toxic Substances Control Act
WISS	Wayne Interim Storage Site

APPENDIX F
FEDERAL FACILITY AGREEMENT

United States Government

Department of Energy

memorandum

DATE: JUL 11 1990

REPLY TO
ATTN OF: EM-1

SUBJECT: Authority to Sign the Federal Facility Agreements for the Wayne and Maywood, New Jersey, FUSRAP Sites

TO: J. LaGrone, Manager
Oak Ridge Operations Office

You are hereby authorized to sign, on behalf of the Department, the approved Federal Facility Agreements negotiated with Region II of the U.S. Environmental Protection Agency for the Formerly Utilized Sites Remedial Action Program sites located in Wayne and Maywood, New Jersey. In addition, authorization is given to conduct, with Headquarters participation, any additional negotiations necessary to modify the agreement subsequent to the termination of the public comment period. This authorization is contingent on limiting the Department's financial commitments to those contained in the Five-Year Plan.

Leo P. Duffy
Director

Office of Environmental Restoration
and Waste Management

Based on the information available to the Parties on the effective date of this FEDERAL FACILITY AGREEMENT (Agreement), and without trial or adjudication of any issues of fact or law, the Parties agree as follows:

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I. JURISDICTION

Each Party is entering into this Agreement pursuant to the following authorities:

(i) The U.S. Environmental Protection Agency (U.S. EPA), Region II, enters into those portions of this Agreement that relate to the Remedial Investigation/Feasibility Study (RI/FS) pursuant to Section 120 (e)(1) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), 42 U.S.C. § 9620(e)(1), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), Pub. L. 99-499 (hereinafter jointly referred to as CERCLA) and Executive Order 12580;

(ii) U.S. EPA, Region II, enters into those portions of this Agreement that relate to Operable Units and Remedial Actions pursuant to Section 120(e)(2) of CERCLA and Executive Order 12580;

(iii) the U.S. Department of Energy (DOE) enters into those portions of this Agreement that relate to the RI/FS pursuant to Section 120(e)(1) of CERCLA, Executive Order 12580, the National Environmental Policy Act, 42 U.S.C. §4321, the Atomic Energy Act of 1954 (AEA), as amended, 42 U.S.C. §2201, and the Congressional Committee Reports accompanying the FY 1984 and FY 1985 Energy and Water Appropriations Acts, PL 98-50 and PL 98-360, respectively;

(iv) DOE enters into those portions of this Agreement that relate to Operable Units, Removal Actions and Remedial Actions pursuant to Section 120(e)(2) of CERCLA, Executive Order 12580 and the AEA.

U.S. EPA agrees that in the exercise of its jurisdiction it will recognize DOE's authorities under the AEA.

II. PURPOSE

A. The general purposes of this Agreement are to:

(1) Ensure that the environmental impacts associated with past and present activities at the Site are thoroughly investigated and appropriate Remedial Action taken as necessary to protect the public health or welfare or the environment;

(2) Establish a procedural framework and schedule for developing, implementing and monitoring appropriate response actions at the Site in accordance with CERCLA, the NCP, and Superfund guidance and policy;

(3) Evaluate all past investigative and response actions taken at the Site by DOE and all related documentation to determine

whether they are the Functional Equivalent of, and consistent with those actions and documentation required by CERCLA, as amended, the NCP, and Superfund guidance and policy;

(4) Facilitate cooperation, exchange of information and participation of the Parties in such actions; and

(5) Ensure that removal and Remedial Actions at the Site will in compliance with federal and state applicable or relevant and appropriate requirements (ARARs).

B. Specifically, the purposes of this Agreement are to:

(1) Identify Removal Actions (Removals) which are appropriate at the Site prior to the implementation of final Remedial Action(s) for the Site. EPA should be informed of proposed and planned Removal Actions and notified as early as possible prior to their occurrence as described in Part X (Removal Actions). This process is designed to enhance communication among the Parties about all activities at the Site.

(2) Identify Operable Unit alternatives which are appropriate at the Site prior to the implementation of final Remedial Action(s) for the Site. Operable Unit alternatives shall be identified and proposed to the Parties as early as possible prior to formal proposal of Operable Units to U.S. EPA pursuant to CERCLA. This process is designed to promote cooperation among the Parties in identifying Operable Unit alternatives prior to selection of remedial measures to address the Operable Unit.

(3) Establish requirements for the performance of a RI to determine fully the nature and extent of the threat to the public health or welfare or the environment caused by the release or threatened release of FUSRAP Waste at the Site and to establish requirements for the performance of a FS for the Site to identify, evaluate, and select alternatives for the appropriate Remedial Action(s) to prevent, mitigate, or abate the release or threatened release of FUSRAP Waste at the Site in accordance with CERCLA.

(4) Identify the nature, objective and schedule of response actions to be taken at the Site. Response actions at the Site shall attain that degree of cleanup of hazardous substances, pollutants or contaminants mandated by CERCLA.

(5) Implement the selected Removal Actions and final Remedial Action(s) in accordance with CERCLA, the NCP, and Executive Order 12580.

(6) Provide for continued operation and maintenance of the selected Remedial Action(s) as necessary.

(7) Assure compliance with federal and state hazardous waste laws and regulations for matters covered by this Agreement.

III. PARTIES

The Parties to this Agreement are U.S. EPA and DOE. The terms of this Agreement shall apply to and be binding upon U.S. EPA and DOE, and all subsequent owners, operators and lessees of the MISS until the site is deleted from the National Priorities List (NPL). Upon request, DOE will notify U.S. EPA of the identity and assigned tasks of each of its contractors performing work under this Agreement upon their selection. Nothing herein shall be construed as an agreement to indemnify any person. DOE shall notify its agents, employees, response action contractors for the Site, and all subsequent owners, operators and lessees of the MISS of the existence of this Agreement until its termination. Each undersigned representative of a Party certifies that he or she is fully authorized to enter into the terms and conditions of this Agreement and to legally bind such Party to this Agreement.

IV. DEFINITIONS

Except as set forth below or otherwise explicitly stated in this Agreement, the terms used in this Agreement shall have the meanings set forth in CERCLA, 42 U.S.C. §9601, et seq., and the NCP. In addition:

A. "Agreement" shall refer to this document and shall include all Attachments to this document.

B. "ARAR" or "applicable or relevant and appropriate requirement" shall mean "legally applicable" or "relevant and appropriate" standards, requirements, criteria or limitations as those terms are used in CERCLA §121(d), 42 U.S.C. 9621(d).

C. "Attachment" shall mean all addenda to this Agreement, including but not limited to any additional definitions, any revised list of documents, submittals or reports, any revised Timetables and Deadlines, and any revised list of Vicinity Properties or other areas to be addressed pursuant to this Agreement. Upon agreement of all Parties, subject to dispute resolution procedures set forth in Part XV of this Agreement, all such Attachments shall be appended to and made an integral and enforceable part of this document.

D. "Authorized Representative" shall include a Party's contractors acting in any capacity, including an advisory capacity, when so designated by that Party.

E. "CERCLA" shall mean the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C § 9601, as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), Pub. L. 99-499.

F. "Days" shall mean calendar days, unless business days are specified, measured from the date of receipt by any Party as evidenced by the signature of the receiving Party. Any Submittal or written statement of dispute that under the terms of this Agreement would be due on a Saturday, Sunday or holiday shall be due on the next business day.

G. "Feasibility Study" or "FS" means that study which fully evaluates and develops Remedial Action alternatives to prevent or mitigate the migration or the release of hazardous substances, pollutants or contaminants at and from the Site.

H. "Formerly Utilized Sites Remedial Action Program" or "FUSRAP" means a Department of Energy program to develop, identify, clean up or otherwise control sites containing residual radioactive materials from the early years of the United States Atomic Energy Program or from commercial operations that resulted in conditions Congress has mandated for DOE to remedy.

I. "Functional Equivalent" shall mean all DOE activities or elements of work undertaken or performed prior to the effective date of this Agreement, including but not limited to, documents, submittals, contracts or actions that upon review by U.S. EPA are determined to meet appropriate substantive objectives, standards, and requirements set forth pursuant to CERCLA, as amended, the National Contingency Plan (NCP), and U.S. EPA guidelines, regulations, rules, and criteria. These standards shall be applied by U.S. EPA in the same manner and to the same extent that such standards are applied to any nongovernmental entity in accordance with recognition of DOE's statutory authorities or responsibilities.

J. "FUSRAP Waste" shall mean and be specifically limited to all contamination, both radiological and chemical, whether commingled or not, on the MISS and all radiological contamination above DOE's action levels related to past thorium processing at the Maywood Chemical Works (MCW) site occurring on any Vicinity Properties. Also included are any chemical or non-radiological contamination on Vicinity Properties that would satisfy either of the following requirements:

- (1) The chemical or non-radiological contaminants are mixed or commingled with radiological contamination above DOE's action levels; or
- (2) The chemical or non-radiological contaminants originated in the MISS or were associated with the

specific thorium manufacturing or processing activities at the Maywood Chemical Works site which resulted in the radiological contamination.

K. "MISS" shall mean the Maywood Interim Storage Site located in Maywood, New Jersey as identified in Part V (Site Description).

L. "National Contingency Plan" or "NCP" shall mean the National Oil and Hazardous Substances Pollution Contingency Plan, 40 C.F.R. Part 300, and any amendments thereof.

M. "NJDEP" shall mean the New Jersey Department of Environmental Protection, its employees and Authorized Representatives.

N. "Operable Unit" shall mean any discrete element of the Site Remedial Actions implemented prior to the selection of all Remedial Actions for the Site. Remedial Actions for Operable Units shall be selected on the basis of RI/FS documentation leading to a Record of Decision. While portions of or complete Operable Units may be addressed through Removal Actions under the jurisdiction of DOE, Operable Units will be addressed through a Record of Decision.

O. "Quality Assured Data" means the data which have undergone quality assurance as set forth in the approved Quality Assurance Project Plan.

P. "Remedial Action" or "RA" shall mean those actions consistent with the permanent remedy, as specified in a Record of Decision, taken to prevent or minimize the release of hazardous substances so that they do not migrate to cause substantial danger to present or future public health or welfare or the environment.

Q. "Remedial Design" or "RD" shall mean the technical analysis and procedures which follow the selection of remedy, as specified in a Record of Decision, for a site and result in a detailed set of plans and specifications for implementation of the Remedial Action.

R. "Remedial Investigation" or "RI" means that investigation conducted to fully determine the nature and extent of the release or threat of release of hazardous substances, pollutants or contaminants and to gather necessary data to support the corresponding Feasibility Study and the risk assessment.

S. "Removal Actions" or "Removals" shall mean those actions taken, with the prior written notification pursuant to Part X, in the event of a release or threat of release of hazardous substances, pollutants or contaminants that poses a threat to human health or welfare or the environment in accordance with Section 300.415(b) of the NCP.

T. "Site" shall include the MISS, Vicinity Properties and any other areas where hazardous substance, pollutants or contaminants that migrated from the MISS or were released as a result of activities at the MISS as discussed in Part V (Site Description) of this Agreement are suspected or found. It shall also include any areas contaminated because of activities related to the Site, whether contamination occurred before or after operations at the Site, whether or not any hazardous substances, pollutants or contaminants were removed from the MISS by people who were unaware of the presence of contamination.

U. "Submittal" shall mean every document, report, schedule, deliverable, work plan or other item to be submitted to U.S. EPA pursuant to this Agreement.

V. "Timetables and Deadlines" shall mean schedules as well as that work and those actions which are to be completed and performed in conjunction with such schedules, including performance of actions established pursuant to the dispute resolution procedures set forth in Part XV of this Agreement.

W. "U.S. DOE" or "DOE" shall mean the U.S. Department of Energy, its employees, contractors, agents, successors, assigns and Authorized Representatives.

X. "U.S. EPA" or "EPA" shall mean the United States Environmental Protection Agency, its employees and Authorized Representatives, unless otherwise stated.

Y. "Vicinity Properties" shall mean those properties not included within the MISS but which are or were contaminated by FUSRAP Waste, and which currently are or were authorized to be remediated under DOE's FUSRAP program and any additional properties added pursuant to Part XVII.

V. SITE DESCRIPTION

For purposes of this Agreement, the approximately 12 acre parcel in the Borough of Maywood and the Township of Rochelle Park, Bergen County, New Jersey, formerly owned by the Stepan Company, which is contaminated by radioactive, chemical and (potentially) mixed waste, (Attachment 1) shall constitute the Maywood Interim Storage Site (MISS). The Parties may change the Site description as provided for in Part XVII (Additional Work) on the basis of additional investigations including the Site Remedial Investigation performed by DOE as described in Part XI (Remedial Investigation) below and Attachment 2.

The MISS is an area established to provide an interim storage site for contaminated materials originating from the former Maywood Chemical Works (MCW). The MISS lies in a highly

developed area in the Borough of Maywood and the Township of Rochelle Park, in the County of Bergen, New Jersey. The MISS is a fenced lot occupying 11.7 acres of property which was previously owned by Stepan Company. The MISS is bounded by New Jersey Route 17 on the west; a New York, Susquehanna, and Western Railroad line on the north; and commercial/industrial areas on the south and east. The MISS currently encompasses a storage pile covering approximately 2 acres and containing 35,000 yd' of low level radioactive and mixed waste and an area that has been prepared for a second storage pile.

The Site also includes numerous Vicinity Properties in the proximity of the former MCW that have FUSRAP Waste. The surveying of additional properties is continuing. Because these Vicinity Properties are numerous and have not all been designated, a description of each property is not practical in this document.

All of the designated properties, including the MISS, shall hereafter be referred to as the Site.

VI. FINDINGS OF FACT

For the purpose of this Agreement only, the following constitutes a summary of facts upon which this Agreement is based. None of the facts related herein shall be considered admissions by any Party with respect to any unrelated claims by a Party or by persons not a Party to this Agreement.

(1) During the 1940s and 1950s, the Manhattan Engineering District (MED) and its immediate successor, the Atomic Energy Commission (AEC), conducted several programs involving research, development, processing, and production of uranium and thorium, and the storing of their processing residues. Nearly all of this work involved some participation by private contractors and/or institutions. Generally, privately-owned and institutionally-owned sites that became contaminated during this early period of the nuclear program, and have since been converted to other use, were decontaminated or stabilized in accordance with the guidelines and survey methods then in existence.

(2) However, radiological guidelines have since become more stringent. As a result, the Department of Energy (DOE) initiated the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1970 with the singular mission of identifying, decontaminating, or otherwise controlling sites where low activity radioactive contamination (exceeding current guidelines) remains from the early years of the nation's atomic energy program or commercial operations causing conditions that Congress has authorized DOE to remedy.

(3) DOE has authority under the Atomic Energy Act to conduct Remedial Actions at a number of sites around the country. In addition to its authority under the Atomic Energy Act, Congressional Committee Reports accompanying the FY 1984 and FY 1985 Energy and Water Development Appropriations Acts, Public Laws 98-350 and 98-360, respectively, authorized DOE to conduct a decontamination research and development project at various New Jersey locations where radioactive contamination is present.

(4) From 1916 through 1956, Maywood Chemical Works processed monazite sand to extract thorium and rare earths for use in the manufacture of industrial products such as mantles for gas lanterns. The residues or tailings from the processing operation, clay-like dirt, contained significant levels of radioactive materials. Some of these process wastes were removed from the Maywood Chemical Works for use as mulch and fill on nearby properties, thereby contaminating those properties with radioactive elements. Some of the material also migrated off-site via natural drainage. During this period, radiological and other products were produced, a portion of which was purchased under various government contracts.

(5) In 1954, the Atomic Energy Commission (AEC) issued License R-103 to the MCW, thereby allowing it to continue to possess, process, manufacture and distribute radioactive materials under the auspices of the Atomic Energy Act of 1954.

(6) Stepan Company purchased the Maywood Chemical Works property in 1959 and was issued an AEC radioactive materials license in 1961.

(7) Based on AEC inspections and information related to the Ballod property on the west side of Route 17, the Stepan Company agreed to perform Remedial Action. The cleanup began in 1963. In 1966, 8,360 cubic yards of waste were removed from the area west of Route 17, and buried on the Stepan Company property, an area now covered by grass. In 1967, 2,053 cubic yards of waste were removed from the same general area and also buried on the Stepan Company property, an area which is now a parking lot. In 1968, Stepan Company obtained permission from the AEC to transfer an additional 8,600 cubic yards of waste from the south end of the Ballod Property and bury it on Stepan property, where a warehouse was later built.

(8) At the request of Stepan Company, a radiological survey of the south end of the Ballod property west of Route 17 was conducted by the AEC in 1968. Based on the findings of that survey, clearance was granted for release of the property for unrestricted use. At the time of the survey, the AEC was not aware of contaminated waste materials still present in the northeast corner of the property. In 1968, the portion of the Stepan Company property west of Highway 17 was sold to a private

citizen who later sold it to the current owners, Ballod and Associates.

(9) In September 1980, an area resident discovered the presence of radioactive contamination on property that had formerly belonged to the Stepan Company.

(10) The discovery that radioactive contamination still existed was reported to the New Jersey Department of Environmental Protection (NJDEP). State representatives conducted surveys and soil sample analyses which identified the presence of thorium-232 and radium-226 on the property. The findings were reported to the Nuclear Regulatory Commission (NRC) in November 1980.

(11) This information prompted the NRC to request a comprehensive survey to assess the radiological condition of the property. The survey was performed by Oak Ridge Associated Universities with the assistance of a representative from the Region I office of the NRC in February 1981. The NRC also requested that an aerial radiological survey of the Stepan Company site, the Ballod and Associates property, and the surrounding area be conducted. This survey, which was conducted by EG&G in January 1981, resulted in the discovery of other anomalies (radiation readings distinctly higher than those of surrounding areas). Elevated gamma radiation readings (greater than the local background level) were detected directly over the Stepan plant, as well as immediately to the west and south of the plant. Two other points of elevated background gamma radiation were detected approximately 0.5 mi from the center of the plant: one to the northeast of the plant and the other to the south of the plant.

(12) The Maywood Site is on the National Priorities List (NPL), 40 CFR Part 300, Appendix B, which has been issued pursuant to Section 105 (a)(8)(B) of CERCLA, 42 U.S.C. §9605 (a)(8)(B). The site was included on the NPL on September 8, 1983.

(13) Through Congressional action (PL98-50) in 1984, the site was included in DOE's FUSRAP program whereby DOE was authorized to conduct a decontamination research and development project related to the radioactive contaminants. Neither DOE nor its predecessor agencies had a role in the generation of this contamination.

(14) DOE, acting under its FUSRAP appropriation, initiated soil removal from affected residences in July, 1984. Subsequent funding has permitted further assessment and, where warranted, removals by DOE. Since no adequate low-level radioactive disposal sites exist, DOE negotiated a Memorandum of Understanding with the Borough of Maywood, dated August 10, 1984, to allow it to store the removed soils on a part of the original Maywood Chemical Company property. This property, the Maywood

Interim Storage Site (MISS), was transferred to DOE by Stepan as part of its funding of cleanup in September, 1985.

(15) The storage pile at the MISS currently contains approximately 35,000 cubic yards of contaminated material. In addition, there are an estimated 32,000 cubic yards of FUSRAP Waste buried on the MISS.

(16) The principal radioactive contaminant found at the Site has been thorium-232 with lesser amounts of radium-226 and uranium-238.

(17) Concurrent with DOE's radiological characterization of the Site, Ebasco Services, Inc. performed a characterization study of non-radiological pollutants for EPA.

(18) The soils analyzed in 1986 by Ebasco from the Vicinity Properties exhibited elevated concentrations of volatile organics (methylene chloride, acetone, methyl ethyl ketone (MEK), benzene, toluene, and ethylbenzene in the ppm range), acid extractables, and six metals (As, Cd, Cr, Pb, Be and Ni varying in concentrations up to several hundred ppm). In addition, nine pesticides (Dieldrin, Lindane, Endosulfan I, Endosulfan sulfate, Aldrin, alpha-BHC, DDE, DDD, and DDT) were detected in various levels up to several hundred ppb. Some soil borings also exhibited the presence of gasoline and fuel oil components, various methylated benzenes, caffeine and the essential oils alpha-pinene and d-limonene.

(19) Many of the substances referred to in the preceding paragraph are hazardous substances within the meaning of Section 101(14) of CERCLA, 42 U.S.C. §9601(14).

(20) On April 27, 1987, U.S. EPA issued Special Notice to Stepan Company and all persons whom it knew to be an owner of property which was found to be chemically contaminated. Following such issuance to these potentially responsible parties, U.S. EPA received a good faith offer and undertook negotiations with Stepan Company to perform an RI/FS at these contaminated properties. U.S. EPA issued the Order on Consent to Stepan Company on September 21, 1987 to perform such RI/FS.

(21) Between August and October, 1987 and March and April, 1988 U.S. EPA's contractor, EBASCO Services Inc., collected split samples of soil and groundwater, respectively, from the Stepan Company property where monitoring wells were being installed by DOE's contractor, Bechtel National Inc.

(22) The soil sample analyses show detection of volatile and semi-volatile organic compounds, including benzenes, toluene, and xylenes; pesticides, including Beta-BHC and 4,4'-DDT; and contaminants of the metals/CN/phenol series, including aluminum,

cadmium, lead, barium, and nickel. The above groundwater analyses show detection of volatile and semi-volatile organics compounds, including benzenes, toluene, xylenes, 1,2-dichloroethene and phenol; pesticides, including Beta-BHC, 4,4'-DDT, dieldrin and aldrin; and contaminants of the metals/CN/phenol series, including aluminum, arsenic, lead, cadmium, nickel, and barium.

(23) By letter dated January 6, 1989, U.S. EPA notified Stepan Company of the presence of hazardous substances, pollutants or contaminants in the groundwater and soil on the Stepan Company property and also advised Stepan Company that investigation of the Stepan Company property should be undertaken and that such investigation should be undertaken as part of the RI/FS which Stepan Company was conducting, pursuant to the Order on Consent.

(24) It is anticipated that such RI/FS field activities will commence during 1990.

VII. U.S. EPA DETERMINATIONS

The following determinations represent the basis for this Agreement. None of the determinations contained herein shall be considered admissions by any Party with respect to any unrelated claims by a Party or any claims by persons not a party to this Agreement.

On the basis of the results of the testing and analyses described in the Findings of Fact, infra, and U.S. EPA files and records, U.S. EPA has determined that:

(1) The Maywood Interim Storage Site (MISS) located in Maywood, New Jersey, constitutes a facility within the meaning of Section 101(9) of CERCLA 42 U.S.C. §9601(9);

(2) DOE is the owner of the MISS facility and is responsible for all response actions related to FUSRAP Waste associated with the MISS and all Vicinity Properties and all contamination related to the MISS;

(3) Hazardous substances, pollutants or contaminants within the meaning of Section 101(14) of CERCLA, 42 U.S.C. §§9601 (14) and (33) and §§9604 (a)(12) (not associated with activities of DOE or its predecessor agencies) have been disposed of at the MISS;

(4) There have been releases and threatened releases of hazardous substances, pollutants or contaminants into the environment within the meaning of 42 U.S.C. §§9601 (22), 9604, 9606 and 9607 at and from the MISS;

(5) The prior and/or continuing presence of radionuclides in the waste materials at the site, in the underlying groundwater, and in soils in nearby properties constitute a release and threatened release of hazardous substances, pollutants or contaminants into the environment as defined in Section 101(22) of CERCLA, 42 U.S.C. §9601 (22);

(6) Radionuclides present at the site include thorium, uranium, radium and radon, which are defined as hazardous air pollutants in Section 112 of the Clean Air Act and are therefore hazardous substances as defined in Section 101(4) of CERCLA, 42 U.S.C. §9601(14);

(7) With respect to those releases and threatened releases, the DOE is a responsible person within the meaning of 42 U.S.C. §9607;

(8) The actions to be taken pursuant to this Agreement are reasonable and necessary to protect the public health or welfare or the environment and are consistent with the National Contingency Plan (NCP);

(9) A reasonable time for beginning and/or completing the actions required by this Agreement has been provided for in Attachment 3; and

(10) The schedule for completing the actions required by this Agreement complies with the requirements of Section 120(e) of CERCLA, 42 U.S.C. §9620(e); and

(11) From 1985 to the present, DOE has been an "owner or operator" of the MISS within the definition of Section 101(20) of CERCLA, 42 U.S.C. §9601(20), and has been an owner or operator of the MISS within the meaning of Section 107(a) of CERCLA, 42 U.S.C. §9607(a).

The Parties have determined that the Submittals, actions, and other elements of work required by this Agreement are necessary to protect the public health or welfare or the environment.

VIII. SCOPE OF AGREEMENT

Under this Agreement DOE shall:

1. In conducting Removal Actions, if any, comply with the provisions of Part X (Removal Actions);

2. Identify and address Operable Units as described in Part IX (Operable Units), and Attachment 2 to this Agreement;

3. Conduct a Remedial Investigation on the Site as described in Part XI (Remedial Investigation) and Attachment 2 to this Agreement;
4. Conduct a Feasibility Study of the Site as described in Part XII (Feasibility Study) and Attachment 2 to this Agreement, incorporating the results of the RI;
5. Develop Remedial Action alternative(s) for the Site and implement those Remedial Actions selected for the Site as described in Part XIII (Remedial Action) and Attachment 2 to this Agreement;

These matters are set forth in more detail in Parts IX-XIII (Operable Units, Removals, RI, FS, RA) and in Attachment 2 to this Agreement. In the event of any inconsistency between Parts I-XLIII of this Agreement and the Attachments to this Agreement, Parts I-XLIII shall govern unless and until duly modified pursuant to this Agreement.

Upon request by DOE, or its contractors, for guidance with respect to any issue related to DOE's obligations under this Agreement, U.S. EPA shall determine within thirty days of such request whether there exists a published guidance document applicable to the subject of the DOE inquiry and provide DOE with the same, or advise DOE of the source of such document. If no published guidance document is available, U.S. EPA will determine whether any pre-publication draft of such document can be made available to DOE and the conditions, if any, upon which such a pre-publication draft may be provided to DOE or its contractor. If U.S. EPA determines that no pre-publication draft is available, or can be provided to DOE, U.S. EPA shall use its best efforts to make DOE aware of the Agency's position with respect to any issue raised by DOE.

Deliverables:

DOE agrees to submit to U.S. EPA certain deliverables within the time periods specified in Part XVI to fulfill the obligations and meet the purposes of this Agreement. The deliverables are listed in Part XIV (Consultation) and are described in detail in Attachment 2 to this Agreement. The schedule for the submittal of the deliverables will be established as described in Part XVI and will become Attachment 3.

IX. OPERABLE UNITS

DOE shall identify Operable Units for the Site as part of the Work Plan. While portions of or complete Operable Units may be addressed through Removal Actions under the jurisdiction of DOE, Operable Units will be addressed through a Record of Decision.

Single or multiple Operable Units may be addressed in each Record of Decision.

X. REMOVAL ACTIONS

- A. Any Removal Action conducted on the Site shall be conducted in a manner consistent with this Agreement, CERCLA and the NCP.
- B. DOE shall be solely responsible for the determination of the areas to be addressed through Removal Actions.
- C. DOE shall provide U.S. EPA with written notification of any proposed Removal Action a minimum of sixty (60) days prior to initiating the proposed action unless the removal is required to mitigate an emergency condition as outlined in (D) below.
- D. If there is an immediate threat to public health or welfare or the environment which requires an immediate response, DOE may take action. However, DOE must notify the U.S. EPA Project Manager orally within 24 hours of when the threat is discovered and inform the Project Manager of the actions to be taken. Response actions will be documented in the quarterly reports.
- E. Nothing in this Agreement shall alter DOE's authority with respect to Removal Actions conducted pursuant to Section 104 of CERCLA, 42 U.S.C. §9604 and Executive Order 12580.

XI. REMEDIAL INVESTIGATION

DOE shall develop, implement and report upon a RI of the Site. The RI documents shall be subject to the review and comment procedures described in Part XIV. Any field investigation efforts and the documentation relative to these efforts preceding this Agreement shall be reviewed by U.S. EPA to determine whether they are the Functional Equivalent of the actions and documentation required by CERCLA, as amended, the NCP, and Superfund guidance and policy. This documentation will be made available by DOE to U.S. EPA. DOE reserves the right to utilize the procedures identified in Part XV, Resolution of Disputes, of this Agreement. The RI shall be conducted in accordance with the requirements and time schedules set forth in Attachment 3 and Part XVI of this Agreement. The RI shall meet the purposes set forth in Part II (Purpose) of this Agreement. The scope of the RI shall be established in the Work Plan. Part of the RI may include a survey for additional areas containing hazardous substances that were contaminated as a consequence of activities at the MISS. The RI of these areas shall be addressed under this Agreement in the same manner as sites and Vicinity Properties identified before this Agreement was signed. The Parties specifically agree that all criteria contained in Attachment 2 to

this Agreement relate solely to the scope of the RI and do not reflect a predetermination of any clean-up level criteria. The Parties further agree that final clean-up level criteria will only be determined following completion of the Risk Assessment. Within thirty (30) days of the effective date of this Agreement, DOE shall initiate discussions with NJDEP and U.S. EPA to develop a proposed list of New Jersey state ARARs. Determination of federal ARARs shall be made in accordance with Part XIV, Section F.

XII. FEASIBILITY STUDY

DOE shall design, propose, undertake and report upon a FS for the Site. The FS documents shall be subject to the review and comment procedures described in Part XIV. The FS shall be conducted in accordance with the requirements and time schedules set forth in Attachments 2 and 3 and Part XVI of this Agreement. The FS shall meet the purposes set forth in Part II (Purpose) of this Agreement.

Any response actions and the documentation relative to these actions performed prior to this Agreement shall be reviewed by U.S. EPA to determine whether they are the Functional Equivalent of the actions and documentation required by CERCLA, as amended, the NCP, and Superfund guidance and policy. This documentation will be made available by DOE to U.S. EPA. DOE reserves the right to utilize the procedures identified in Part XV, Resolution of Disputes, of this Agreement.

XIII. REMEDIAL ACTION SELECTION AND IMPLEMENTATION

Following completion of the RI and the FS and consultation with U.S. EPA as described in Part XIV, DOE shall publish its proposed Remedial Action plan(s) for public review and comment in accordance with CERCLA §117(a) and applicable state law and comply with all other applicable provisions of CERCLA §117. Upon completion of the public comment period, all Parties will consult as to the need for modification of the proposed Remedial Action plan(s) and additional public comment based on public response. When public comment has been properly considered, DOE shall submit its draft Record of Decision in accordance with applicable guidance. Review and consultation with U.S. EPA shall be conducted on the draft Record of Decision in accordance with Part XIV. If the Parties agree on the draft Record of Decision, the draft Record of Decision shall be adopted by U.S. EPA and DOE. DOE shall prepare the final Record of Decision. If the Parties are unable to reach agreement on the draft Record of Decision, final selection of the Remedial Action(s) for the Site shall be made by the U.S. EPA Administrator, which is not subject to dispute resolution by DOE, and U.S. EPA shall then prepare the

final Record of Decision. This does not preclude any rights of the Parties pursuant to Part XXXI (Reservation of Rights). Notice of the final Record of Decision adopted shall be published by the Party preparing it and shall be made available to the public prior to commencement of the Remedial Action, in accordance with CERCLA §117(d).

Following final selection of the Remedial Action, DOE shall design, propose and submit a Remedial Action Implementation Plan, including appropriate Timetables and schedules, to U.S. EPA for review and comment as described in Part XIV. Following consultation with U.S. EPA as described in Part XIV, DOE shall implement the Remedial Action(s) in accordance with the requirements and time schedules set forth in Attachments 2 and 3 and Part XVI of this Agreement. A dispute arising under this Part on any matter other than the final selection of a Remedial Action shall be resolved pursuant to Part XV (Dispute Resolution).

The purpose of the Remedial Action Implementation Plan is to establish procedures for implementation of selected response actions.

EPA and DOE acknowledge that as of the signing of this Agreement, no off-site disposal facility has been identified which is currently licensed and permitted to accept the combinations of hazardous substances which have been identified at the site. The parties recognize that the establishment and permitting of such a facility will be a difficult and time consuming process. Therefore, in an effort to minimize the time required to implement the selected remedial action, EPA and DOE agree to continue their efforts to identify and evaluate disposal options during the pendency of the RI/FS.

XIV. CONSULTATION WITH U.S. EPA **REVIEW AND COMMENT PROCESS FOR DRAFT AND FINAL DOCUMENTS**

A. **Applicability:** The provisions of this Part establish the procedures that shall be used by the Parties to provide the Parties with appropriate notice, review, comment, and response to comments regarding RI/FS and Remedial Design/Remedial Action (RD/RA) documents, specified herein as either primary or secondary documents. In accordance with Section 120 of CERCLA, DOE will normally be responsible for issuing primary and secondary documents to U.S. EPA. As of the effective date of this Agreement, all draft and final documents for any deliverable document identified herein shall be prepared, distributed, and subject to dispute in accordance with Paragraphs B through J below.

The designation of a document as "draft" or "final" is solely for purposes of consultation with U.S. EPA in accordance with this Part. Such designation does not affect the obligation of the Parties to issue documents, which may be referred to herein as "final," to the public for review and comment as appropriate and as required by law.

B. General Process for RI/FS and RD/RA documents:

1. Primary documents include those documents that are major, discrete portions of RI/FS or RD/RA activities, including all documents relating to Operable Units. Primary documents are initially issued by DOE in draft subject to review and comment by U.S. EPA. Following receipt of comments on a particular draft primary document, DOE will respond to the comments received and issue a draft final primary document subject to dispute resolution. The draft final primary document will become the final primary document 30 days after the period established for review of a draft final document if dispute resolution is not invoked. If dispute resolution is invoked, the draft final primary document will become the final primary document in accordance with the dispute resolution process described in Part XV (Resolution of Disputes).

2. Secondary documents include those documents that are discrete portions of the primary documents and are typically input or feeder documents. Secondary documents are issued by DOE in draft subject to review and comment by U.S. EPA. Although DOE will respond to comments received, the draft secondary documents may be finalized in the context of the corresponding primary documents. A secondary document may be disputed at the time the corresponding draft final primary document is issued.

C. Primary Documents:

1. DOE shall complete and transmit drafts of the following primary documents to U.S. EPA for review and comment in accordance with the provisions of this Part.

1. RI/FS Work Plan, including the Sampling and Analysis Plan
2. Community Relations Plan
3. Risk Assessment
4. RI Report
5. FS Report
6. Proposed Remedial Action Plan
7. Remedial Design
8. Remedial Action Implementation Plan

2. Only the draft final documents for the primary documents identified above shall be subject to dispute resolution. DOE shall complete and transmit draft primary documents in accordance

with the Timetable and Deadlines established in Part XVI of this Agreement.

D. Secondary Documents:

1. DOE shall complete and transmit drafts of the following secondary documents to U.S. EPA for review and comment in accordance with the provisions of this Part:

1. Post-screening Investigation Work Plan (if appropriate)
2. Treatability Studies (if appropriate)

2. Although U.S. EPA may comment on the drafts of the secondary documents listed above, such documents shall not be subject to dispute resolution except as provided by Paragraph B hereof. Target dates shall be established for the completion and transmission of draft secondary documents pursuant to Part XVI of this Agreement.

E. Meetings of the Project Managers on Development of Documents:

The Project Managers shall meet approximately every sixty (60) days, except as otherwise agreed by the Parties, to review and discuss the progress of work being performed at the site and on the primary and secondary documents. Prior to issuing any draft document specified in Paragraphs C and D above, the Project Managers shall meet to discuss the document results in an effort to reach a common understanding, to the maximum extent practicable, with respect to the results to be presented in the draft document.

F. Identification and Determination of Potential ARARs:

1. For those primary documents or secondary documents that consist of or include ARAR determinations, prior to the issuance of a draft document, the Project Managers shall meet to identify and propose, to the best of their ability, all potential ARARs pertinent to the document being addressed. Draft ARAR determinations shall be prepared by DOE in accordance with Section 121(d)(2) of CERCLA, the NCP and pertinent guidance issued by U.S. EPA, which is not inconsistent with CERCLA and the NCP.

2. In identifying potential ARARs, the Parties recognize that actual ARARs can be identified only on a site-specific basis and that ARARs depend on the specific hazardous substances, pollutants and contaminants at a site, the particular actions proposed as a remedy and the characteristics of a site. The Parties recognize that ARAR identification is necessarily an iterative process and that potential ARARs must be re-examined throughout the RI/FS process until a ROD is issued.

G. Review and Comment on Draft Documents:

1. DOE shall complete and transmit each draft primary document to U.S. EPA on or before the corresponding Deadline established for the issuance of the document. DOE shall complete and transmit the draft secondary document in accordance with the target dates established for the issuance of such documents established pursuant to Part XVI of this Agreement.
2. Unless the Parties mutually agree to another time period, all draft primary and secondary documents shall be subject to a 60-day period for review and comment. Review of any document by U.S. EPA may concern all aspects of the document (including completeness) and should include, but is not limited to, technical evaluation of any aspect of the document, and consistency with CERCLA, the NCP, Executive Order 12580 and any pertinent guidance or policy issued by U.S. EPA. Comments by U.S. EPA shall be provided with adequate specificity so that DOE may respond to the comment and, if appropriate, make changes to the draft document. Comments shall refer to any pertinent sources of authority or references upon which the comments are based, and, upon request of DOE, U.S. EPA shall provide a copy of the cited authority or reference. In cases involving complex or unusually lengthy documents, U.S. EPA may extend the 60-day comment period for an additional 20 days by written notice to DOE no later than ten (10) days prior to the end of the 60-day period. In appropriate circumstances, this time period may be further extended in accordance with Part XXXIII (Extensions) hereof. On or before the close of the comment period, U.S. EPA shall transmit by next day mail their written comments to DOE.
3. Representatives of DOE shall make themselves readily available to U.S. EPA during the comment period for purposes of informally responding to questions and comments on draft documents. Oral comments made during such discussions need not be the subject of a written response by DOE on the close of the comment period.
4. In commenting on a draft document which contains a proposed ARAR determination, U.S. EPA shall include a reasoned statement of whether it objects to any portion of the proposed ARAR determination. To the extent that U.S. EPA does object, U.S. EPA shall explain the bases for its objection in detail and shall identify any ARARs which it believes were not properly addressed in the proposed ARAR determination.
5. Following the close of the comment period for a draft document, DOE shall give full consideration to all written comments on the draft document submitted during the comment period. Within 60 days of the close of the comment period on a draft secondary document, DOE shall transmit to U.S. EPA its written response to comments received within the comment period.

Within sixty (60) days of the close of the comment period on a draft primary document, DOE shall transmit to U.S. EPA a draft final primary document, which shall include DOE's response to all written comments received within the comment period. While the resulting draft final document shall be the responsibility of DOE, it shall be the product of consensus to the maximum extent possible.

6. DOE may extend the 60 day period for either responding to comments on a draft document or for issuing the draft final primary document for an additional 20 days by providing written notice to U.S. EPA at least ten (10) days prior to the end of the period. In appropriate circumstances, this time period may be further extended in accordance with Part XXXIII hereof.

H. Availability of Dispute Resolution for Draft Final Primary Documents:

1. Dispute resolution shall be available to the Parties for draft final primary documents as set forth in Part XV. Draft final primary documents shall be subject to a thirty (30) day period for U.S. EPA review and comment.

2. When dispute resolution is invoked on a draft primary document, work may be stopped in accordance with the procedures set forth in Part XV regarding dispute resolution.

I. Finalization of Documents:

The draft final primary document shall serve as the final primary document if no Party invokes dispute resolution regarding the document or, if invoked, at completion of the dispute resolution process should DOE's position be sustained. If DOE's determination is not sustained in the dispute resolution process, DOE shall prepare, within not more than 35 days after receipt of written resolution of the dispute, a revision of the draft final document which conforms to the results of dispute resolution. In appropriate circumstances, the time period for this revision period may be extended in accordance with Part XXXIII hereof.

J. Subsequent Modifications of Final Documents:

Following finalization of any primary document pursuant to Paragraph I above, either Party may seek to modify the document, including seeking additional field work, pilot studies, computer modeling or other supporting technical work, only as provided in Paragraphs 1 and 2 below.

1. Either Party may seek to modify a document after finalization if it determines, based on new information (i.e., information that became available, or conditions that became known, after the document was finalized) that the requested modification is

necessary. U.S. EPA or DOE may seek such a modification by submitting a concise written request to the Project Managers of the other Parties. The request shall specify the nature of the requested modification and specifically define the new information on which the request is based.

2. In the event that a consensus is not reached by the Project Managers on the need for a modification, either U.S. EPA or DOE may invoke dispute resolution to determine if such modification shall be conducted. Modification of a document shall be required only upon a showing that: 1) the requested modification is based on significant new information, and 2) the requested modification could be of significant assistance in evaluating impacts on the public health or welfare or the environment, in evaluating the selection of remedial alternatives, or in protecting human health or welfare or the environment.

3. Nothing in this Subpart shall alter U.S. EPA's ability to request the performance of additional work pursuant to Part XVII of this Agreement (Additional Work) which does not constitute modification of a final document.

XV. RESOLUTION OF DISPUTES

Except as specifically set forth elsewhere in this Agreement, if a dispute arises under this Agreement between the Parties, the procedures of this Part shall apply. The Parties shall make reasonable efforts to informally resolve disputes at the Project Manager or immediate supervisor level. If resolution cannot be achieved informally, the procedures of this Part shall be implemented to resolve a dispute.

A. Within thirty (30) days after: (1) the period established for review of a draft final primary document pursuant to Part XIV of this Agreement, or (2) any action which leads to or generates a dispute (including a failure of the informal dispute resolution process), the disputing Party shall submit to the Dispute Resolution Committee (DRC) a written statement of dispute setting forth the nature of the dispute, the work affected by the dispute, the disputing Party's position with respect to the dispute and the information the disputing Party is relying upon to support its position. Within thirty (30) days of receipt of notice of dispute, the other Party may submit a written statement of position.

B. Prior to the issuance of a written statement of dispute, the disputing Party shall engage the other Party in informal dispute resolution among the Project Managers and/or their immediate supervisors. During this informal dispute resolution period the Parties shall meet as many times as are necessary to discuss and attempt resolution of the dispute.

C. If agreement cannot be reached on any issue within the informal dispute resolution period, the disputing Party shall forward the written statement of dispute to the Dispute Resolution Committee (DRC) thereby elevating the dispute to the DRC for resolution.

D. The DRC will serve as a forum for resolution of disputes for which agreement has not been reached through informal dispute resolution. The Parties shall each designate one individual and an alternate to serve on the DRC. The individuals designated to serve on the DRC shall be employed at the policy level (Senior Executive Service (SES) or equivalent) or be delegated the authority to participate on the DRC for the purposes of dispute resolution under this Agreement. The U.S. EPA representative on the DRC is the Emergency and Remedial Response Division Director of U.S. EPA's Region II. DOE's designated member is the DOE Technical Services Division Director. Written notice of any delegation of authority from a Party's designated representative on the DRC shall be provided to the other Party pursuant to the procedures of Part XXI (Notification).

E. Following the receipt of all statements of position or the expiration of the period provided for their submittal, the DRC shall have twenty-one (21) days to unanimously resolve the dispute and issue a written decision. If the DRC is unable to unanimously resolve the dispute within this twenty-one (21) day period, the written statement of dispute shall be forwarded within seven (7) days to the Senior Executive Committee (SEC) for resolution.

F. The SEC will serve as the forum for resolution of disputes for which agreement has not been reached by the DRC. The U.S. EPA representative on the SEC is the Regional Administrator of U.S. EPA's Region II. DOE's representative on the SEC is the DOE Oak Ridge Operations Manager. The SEC members shall, as appropriate, confer, meet and exert their best efforts to resolve the dispute and issue a written decision. If unanimous resolution of the dispute is not reached within twenty-one (21) days, the U.S. EPA's Regional Administrator shall issue a written position on the dispute. DOE may, within twenty-one (21) days of the Regional Administrator's issuance of U.S. EPA's position, issue a written notice elevating the dispute to the Administrator of U.S. EPA for resolution in accordance with all applicable laws and procedures. In the event that DOE elects not to elevate the dispute to the Administrator within the designated twenty-one (21) day escalation period, DOE shall be deemed to have agreed with the Regional Administrator's written position with respect to the dispute.

G. Upon escalation of a dispute to the Administrator of U.S. EPA pursuant to Subpart F, the Administrator will review and resolve the dispute within twenty-one (21) days. Upon request, and prior

to resolving the dispute, the U.S. EPA Administrator shall meet and confer with the Secretary of the DOE to discuss the issue(s) under dispute. Upon resolution, the Administrator shall provide DOE with a written final decision setting forth resolution of the dispute.

H. The pendency of any dispute under this Part shall not affect DOE's responsibility for timely performance of the work required by this Agreement, except that the time period for completion of work affected by such dispute shall be extended for a period of time usually not to exceed the actual time taken to resolve any good faith dispute in accordance with the procedures specified herein. All elements of the work required by this Agreement which are not affected by the dispute shall continue and be completed in accordance with the applicable schedule.

I. When dispute resolution is in progress, work affected by the dispute will immediately be discontinued if the Emergency and Remedial Response Division (ERRD) Director for U.S. EPA's Region II requests, in writing, that work related to the dispute be stopped because, in U.S. EPA's opinion, such work is inadequate or defective, and such inadequacy or defect is likely to yield an adverse effect on human health or welfare or the environment, or is likely to have a substantial adverse effect on the remedy selection or implementation process. To the extent possible, U.S. EPA shall give DOE prior notification that a work stoppage request is forthcoming. After stoppage of work, if DOE believes that the work stoppage is inappropriate or may have potential significant adverse impacts, DOE may meet with the U.S. EPA Region II ERRD Director to discuss the work stoppage. Following this meeting, and further consideration of the issues, the U.S. EPA Region II ERRD Director will issue, in writing, a final decision with respect to the work stoppage. The final written decision of the Division Director may immediately be subjected to formal dispute resolution. Such dispute may be brought directly to either the DRC or the SEC, at the discretion of DOE.

J. Within twenty-one (21) days of resolution of a dispute pursuant to the procedures specified in this Part, DOE shall incorporate the resolution and final determination into the appropriate plan, schedule or procedures and proceed to implement this Agreement according to the amended plan, schedule or procedures.

K. Resolution of a dispute pursuant to this Part of the Agreement constitutes a final resolution of that dispute arising under this Agreement. All Parties shall abide by all terms and conditions of any final resolution of dispute obtained pursuant to this Part of this Agreement.

L. Resolution of disputes may include a determination of the length of any time extensions which are necessary.

XVI. PROJECT SCHEDULES

A. Within forty-five (45) days of the effective date of this Agreement, DOE shall propose Deadlines for completion of the following draft primary documents:

1. RI/FS Work Plan, including the Sampling and Analysis Plan
2. Community Relations Plan
3. Risk Assessment
4. RI Report
5. FS Report
6. Proposed Remedial Action Plan

Within forty-five (45) days of receipt of the proposed Deadlines, U.S. EPA shall review and provide comments to DOE regarding the proposed Deadlines. Within forty-five (45) days following receipt of the comments DOE shall, as appropriate, make revisions and reissue the proposal. The Parties shall meet as necessary to discuss and finalize the proposed Deadlines. If DOE and U.S. EPA agree on proposed Deadlines, the finalized Deadlines shall be incorporated into the appropriate Work Plans and become Attachment 3. If DOE and U.S. EPA fail to agree within forty-five (45) days of DOE's receipt of U.S. EPA's comments on the proposed Deadlines, U.S. EPA's position shall be binding upon DOE unless DOE invokes dispute resolution within five (5) days of the close of the expiration of said forty-five (45) day period pursuant to Part XV of this Agreement. The final Deadlines established pursuant to this Paragraph shall be published by U.S. EPA, in conjunction with DOE and become Attachment 3.

B. Within forty-five (45) days of issuance of the Record of Decision, DOE shall propose Deadlines for completion of the following draft primary documents:

7. Remedial Design
8. Remedial Action Implementation Plan

These Deadlines shall be proposed, finalized and published utilizing the same procedures set forth in Paragraph A above.

C. The Deadlines set forth in this Part, or to be established as set forth in this Part, may be extended only as explicitly provided in this Agreement. The Parties recognize that one possible basis for extension of the Deadlines for completion of the Remedial Investigation and Feasibility Study Reports is the identification of significant new Site conditions during the performance of the Remedial Investigation.

XVII. ADDITIONAL WORK OR MODIFICATION TO WORK

A. In the event that U.S. EPA determines that additional work, or modification to work, including remedial investigatory work, engineering evaluation and/or minor field modifications, is necessary to accomplish the objectives of this Agreement, notification of such additional work or modification to work, with appropriate Deadlines, shall be provided to DOE. DOE agrees, subject to the dispute resolution procedures set forth in Part XV, to implement any such work.

B. Any additional work or modification to work determined to be necessary by DOE shall be proposed by DOE and shall be subject to the review and comment procedures described in Part XIV of this Agreement prior to initiation of any work or modification to work.

C. Within thirty (30) days following a modification pursuant to Subpart A or B, the DOE Project Manager shall prepare a memorandum detailing the modifications and shall provide or mail a copy of the memorandum to the other Project Managers.

D. Any additional work or modification to work approved pursuant to Subpart A or B of this Part shall be completed in accordance with the standards, specifications, and schedule determined or approved by the Parties. If any additional work or modification to work will adversely affect work scheduled or will require significant revisions to an approved Work Plan, the U.S. EPA Project Manager shall be notified immediately of the circumstances by DOE followed by a written explanation within ten (10) business days of the initial notification.

E. Any additional work or modification of work agreed to pursuant to this Agreement shall be governed by the provisions of this Agreement.

F. Additional properties may be proposed by the Parties for further Remedial Investigation pursuant to this Agreement on the basis of data or measurements which identify contamination that may have originated from the MISS prior or subsequent to DOE ownership. Additional properties may be proposed, pursuant to the provisions of this Agreement, for inclusion in the Feasibility Study or Remedial Action phase provided there is data indicating the property is contaminated with FUSRAP Waste. The process for such proposal and addition shall be initiated as follows:

1. By DOE:

- a. A proposal recommending that additional properties be included for response action shall be sent to U.S. EPA at the address listed in Part XVII of this Agreement.

- b. If U.S. EPA agrees to the addition, the properties shall be included within the scope of this Agreement, and an addendum shall be attached and incorporated herein.
 - c. If U.S. EPA does not agree to the addition of the properties, U.S. EPA shall make a written determination about whether the properties shall be included. DOE may initiate the Dispute Resolution procedures of Part XIV and shall provide to U.S. EPA a written statement of position with respect to the dispute within 30 days. After the 30-day period, or, if invoked, after the termination of the Dispute Resolution procedures, an addendum shall be attached and incorporated herein specifying the addition of any new properties.
2. By EPA:
- a. EPA shall prepare and transmit to DOE a proposal for addition of specific properties. The proposal shall include justification.
 - b. The proposal shall be reviewed by DOE and responded to within 45 days of receipt, stating the basis for any disagreements or objections.
 - c. If DOE agrees to the addition of the properties, the properties shall be included within the scope of this Agreement and an addendum shall be attached and incorporated herein.
 - d. If DOE does not agree to the addition of the properties, U.S. EPA shall make a written determination about whether the properties shall be included. DOE may initiate the Dispute Resolution procedures of Part XIV and shall provide to U.S. EPA a written statement of position with respect the dispute within 30 days. After the 30-day period or, if invoked, after the termination of the Dispute Resolution procedures, an addendum shall be attached and incorporated herein specifying the addition of any new properties.

XVIII. PERMITS

A. The Parties recognize that under Sections 121(d) and 121(e)(1) of CERCLA, 42 U.S.C. §§ 9621(d) and 9621(e)(1), and the NCP, portions of the response actions called for by this Agreement and conducted entirely onsite as that definition is used in the NCP are exempted from the procedural requirement to obtain a federal, state, or local permit but must satisfy all the applicable or relevant and appropriate federal and state

standards, requirements, criteria, or limitations which would have been included in any such permit. When DOE proposes a response action to be conducted entirely onsite, which in the absence of Section 121(e)(1) of CERCLA and the NCP would require a federal or state permit, and for which DOE does not seek a permit, DOE shall include in the Submittal to the Parties:

- (1) Identification of each permit which would otherwise be required;
- (2) Identification of the standards, requirements, criteria, or limitations which would have had to have been met to obtain each such permit;
- (3) Explanation of how the response action proposed will meet the standards, requirements, criteria or limitations identified in (2) immediately above.

Upon written request of DOE, U.S. EPA will provide its position with respect to (2) and (3) above in a timely manner.

B. Subpart A above is not intended to relieve DOE from the requirement(s) of obtaining a permit whenever it proposes a response action involving the shipment or movement from the Site of a hazardous substance.

C. DOE shall be responsible for obtaining all federal, state or local permits which are necessary for the performance of any work under this Agreement. DOE shall notify U.S. EPA in writing of any permits required for off-Site activities as soon as it becomes aware of the requirement. Upon request, DOE shall provide U.S. EPA copies of all such permit applications and other documents related to the permit process.

D. If a permit which is necessary for implementation of this Agreement is not issued, or is issued or renewed in a manner which is materially inconsistent with the requirements of this Agreement, DOE agrees it shall notify U.S. EPA of its intention to propose modifications to this Agreement to conform to the permit (or lack thereof). Notification by DOE of its intention to propose such modifications shall be submitted within fifteen (15) days of receipt by DOE of notification that: (1) a permit will not be issued; (2) a permit has been issued or reissued; or (3) a final determination with respect to any appeal related to the issuance of a permit has been entered. Within forty-five (45) days from the date it submits its notice of intention to propose modifications, DOE shall submit to U.S. EPA its proposed modifications to this Agreement with an explanation of its reasons in support thereof.

E. U.S. EPA shall review and comment upon proposed modifications to this Agreement in accordance with Part XIV of this Agreement. If DOE submits proposed modifications prior to a final

determination of any appeal taken related to a permit needed to implement this Agreement, U.S. EPA may elect to delay review of the proposed modifications until after such final determination is entered. If U.S. EPA elects to delay such review, DOE shall continue implementation of this Agreement as provided in Subpart F of this Part.

F. During any appeal related to any permit required to implement this Agreement or during review of any of DOE's proposed modifications as provided in Subpart D above, DOE shall continue to implement those portions of this Agreement which can be reasonably implemented pending final resolution of the permit issue(s).

XIX. CREATION OF DANGER

In the event U.S. EPA determines that activities conducted pursuant to this Agreement, or any other circumstances or activities, are creating a danger to the health or welfare of the people on the Site or in the surrounding area or to the environment, and so notifies DOE, DOE will take immediate action to notify all affected parties, including state and local health officials, and in the case of contamination originating on the Site or which is the result of activities in connection with the Site, will expeditiously take appropriate measures to protect the public health or welfare or the environment affected. If directed by U.S. EPA to undertake such action, DOE shall immediately comply without regard to the invocation of Dispute Resolution hereunder. U.S. EPA may direct DOE to stop further implementation of this Agreement for such period of time as needed to abate the danger.

Notwithstanding any authority that U.S. EPA may have, DOE reserves its rights and authorities under the AEA to order cessation of any activities or elements of work that it determines poses a potentially hazardous condition to the health or welfare of the people on the Site or in the surrounding area or to the environment. Upon the issuance of such an order, DOE will notify all affected Parties including state and local health officials, and in the case of contamination originating on the Site or which is the result of activities in connection with the Site, will expeditiously take measures to protect the public health or welfare or the environment, consistent with other parts of this Agreement, including those of Section X, Removal Actions.

XX. REPORTING

A. Quarterly Reports: DOE agrees it shall submit to U.S. EPA quarterly written progress reports which shall include, at a minimum, the following:

- (1) The actions which DOE has taken during the previous quarter to implement the requirements and time schedules of this Agreement;
- (2) A description of all actions scheduled for completion during the quarter that were not completed along with a statement indicating why such actions were not completed and an anticipated completion date;
- (3) Identification of any anticipated delays in meeting time schedules, the reasons for the delay and actions taken to prevent or mitigate the delay;
- (4) Copies of all quality-assured data and sampling and test results and all other laboratory deliverables received by DOE during the quarter;
- (5) A description of the actions which are scheduled for the following quarter.

Progress reports shall be submitted by the thirtieth (30) day following the end of the quarter.

During periods of extended field activity (e.g., two [2] quarters or more), DOE shall provide monthly progress reports which will include the data identified above. These monthly reports shall be submitted by the twentieth (20) day of each month following initial mobilization and revert to quarterly reporting in the next quarter following demobilization.

B. Annual Reports: DOE agrees it shall report to the Parties annually on the progress of the RI/FS, Remedial Action program and Remedial Design. The quarterly report for the fourth calendar quarter will serve as the annual report and in addition to the data identified above, each such report shall summarize all work accomplished for the year, and provide updated maps and illustrations, and an updated schedule of sampling and analysis for each monitoring location.

XXI. NOTIFICATION

A. As specified in Attachment 2, copies of any report, document or submittal provided pursuant to a schedule or Deadline identified in, developed or incorporated under this Agreement shall be sent by certified mail or overnight mail, return receipt requested. Documents sent to EPA shall be addressed or hand delivered to:

Name
CERCLA Regional Project Manager for
Maywood Interim Storage Site
Emergency and Remedial Response Division
U.S. EPA
26 Federal Plaza, Room _____
New York, New York 10278

Documents sent to DOE shall be addressed as follows unless DOE specifies otherwise by written notice:

Robert G. Atkin
Site Manager
Technical Services Division
U.S. Department of Energy
Oak Ridge Operations
P.O. Box 2001
Oak Ridge, Tennessee 37831-8723

Unless otherwise requested, all routine correspondences may be sent via regular mail to the above-named persons.

B. U.S. EPA shall provide the Secretary of Energy with a forty-five (45) day advance notice of the U.S. EPA Administrator's intention to delegate the authority to select appropriate Remedial Actions pursuant to this Agreement, including the listing of the Site on the Remedy Delegation Report.

XXII. PROJECT MANAGERS

A. The Parties shall each designate a Project Manager and Alternate (hereinafter jointly referred to as Project Manager) for the purpose of overseeing the implementation of this Agreement. Within fifteen (15) days of the effective date of this Agreement, each Party shall notify all the other Parties of the name and address of its Project Manager. Any Party may change its designated Project Manager by notifying the other Parties, in writing, within ten (10) days of the change.

B. To the maximum extent possible, communications between the Parties concerning the terms and conditions of this Agreement shall be directed through the Project Managers as set forth in Part XXI of this Agreement. Each Project Manager shall be responsible for assuring that all communications from the other Project Managers are appropriately disseminated and processed by the entities which the Project Managers represent.

C. Subject to the limitations set forth in Part XXV (Site Access), Subpart A, and the U.S. EPA Project Manager shall have the authority, which includes but is not limited to, to:

- (1) Take samples, request split samples of DOE samples and ensure that work is performed properly and pursuant to U.S. EPA protocols as well as pursuant to the Attachments and plans incorporated into this Agreement;
- (2) Observe all activities performed pursuant to this Agreement, take photographs and make such other reports on the progress of the work as the Project Manager deems appropriate;
- (3) Review records, files and documents relevant to this Agreement; and
- (4) Recommend and request minor field modifications to the work to be performed pursuant to this Agreement, or in techniques, procedures or design utilized in carrying out this Agreement, which are necessary to the completion of the project.

D. The DOE Project Manager may also recommend and request minor field modifications to the work to be performed pursuant to this Agreement, or in techniques, procedures or design utilized in carrying out this Agreement, which are necessary to the completion of the project.

E. Any field modifications proposed under this Part by any Party must be approved orally by Project Managers for DOE and U.S. EPA to be effective. If agreement cannot be reached between U.S. EPA and DOE on any proposed additional work or modification to work, the dispute resolution procedures set forth in Part XV may be used in addition to this Part.

F. Within ten (10) days following a modification made pursuant to this Part, the Project Manager who requested the modification shall prepare a memorandum detailing the modification and the reasons therefore and shall provide or mail a copy of the memorandum to the other Project Manager.

G. The Project Manager for DOE, his/her designated representative or appropriate contractor, shall be physically present on the Site or reasonably available to supervise work performed at the Site during implementation of the work performed pursuant to this Agreement and shall make himself/herself available to the U.S. EPA Project Manager for the pendency of this Agreement. The absence of the U.S. EPA Project Manager from the Site shall not be cause for work stoppage.

XXIII. SAMPLING AND DATA/DOCUMENT AVAILABILITY

A. DOE shall use Quality Assurance, Quality Control (hereinafter "QA/QC") and chain-of-custody procedures during all field investigation, sample collection and laboratory analysis

activities in accordance with U.S. EPA guidance referenced in the U.S. EPA approved QAPP plan.

B. The Parties shall make available to each other quality assured results of sampling, tests or other data generated by any Party, or on their behalf, with respect to the implementation of this Agreement within ninety (90) days of performance of such sampling or tests. If quality assurance is not completed within ninety (90) days, the Parties shall provide notification ten (10) days prior to the end of the 90-day period that the data will not be available and that Quality Assured Data or results shall be submitted as soon as they become available.

C. At the request of the U.S. EPA Project Manager, DOE shall allow split or duplicate samples to be taken by U.S. EPA during sample collection conducted during the implementation of this Agreement. The DOE's Project Manager shall endeavor to notify the U.S. EPA Project Manager not less than thirty (30) business days in advance of any sample collection. If it is not possible to provide thirty (30) business days prior notification, DOE shall notify the U.S. EPA Project Manager as soon as possible after becoming aware that samples will be collected.

D. DOE shall submit to U.S. EPA copies of records and other documents, including draft sampling and monitoring data, as requested by U.S. EPA.

XXIV. RETENTION OF RECORDS

Each Party to this Agreement shall preserve for a minimum of ten (10) years after termination and satisfaction of this Agreement all of its records and documents, except drafts of finalized documents which relate to the implementation of this Agreement, including but not limited to, the complete Administrative Record, post-Record of Decision primary and secondary documents and quarterly/monthly reports, despite any document retention policy to the contrary. After this ten (10) year period, DOE shall notify U.S. EPA at least ninety (90) days prior to destruction or disposal of any such documents or records. Upon request by U.S. EPA, DOE shall make available such records or documents to U.S. EPA.

XXV. SITE ACCESS

A. Without limitation on any authority conferred on U.S. EPA by statute or regulation, the U.S. EPA and/or its Authorized Representatives, shall have authority to enter the Site at all reasonable times for the purposes of, among other things:

(1) inspecting records, files, photographs, operating logs, contracts and other documents relevant to implementation of this Agreement;

(2) reviewing the progress of DOE, its response action contractors or lessees in implementing this Agreement;

(3) conducting such tests as the U.S. EPA Project Manager deems necessary;

(4) verifying the data submitted to U.S. EPA by DOE; and

(5) using sound, optical or other types of recording equipment to record activities which have been or are being conducted pursuant to this Agreement.

U.S. EPA agrees that its Project Manager shall be required to notify DOE of an impending site visit to allow time for DOE to arrange escort. U.S. EPA further agrees that it and/or its Authorized Representative shall comply with all applicable OSHA standards and FUSRAP Health and Safety Plan requirements. These standards and/or requirements shall include, but are not limited to:

1. Be respirator trained, fit-tested and/or medically approved as appropriate prior to entering restricted site areas;
2. Be briefed on safety and site-specific hazards; and
3. Have an escort familiar with the site and its hazards.

Notwithstanding the foregoing, in emergency situations, DOE agrees that site access by U.S. EPA and/or the Authorized Representatives shall be honored conditioned only upon presentation of proper credentials.

B. To the extent that access is required to areas of the Site presently owned by or leased to parties other than DOE, DOE agrees to exercise its authorities to obtain access pursuant to Section 104(e) of CERCLA from the present owners and/or lessees. DOE shall use its best efforts to obtain access agreements to these areas in time to avoid delay in the completion of any activity performed under this Agreement. All such access agreements shall provide reasonable access to U.S. EPA and/or its Authorized Representatives.

With respect to non-DOE property upon which monitoring wells, pumping wells, treatment facilities or other response actions are to be located, such access agreements shall also provide that no conveyance of title, easement, or other interest in the property

shall be consummated without provisions for the continued operation of such wells, treatment facilities, or other response actions on the property. The access agreements shall also provide that the owners of the Site or of any property where monitoring wells, pumping wells, treatment facilities or other response actions are located shall notify DOE and U.S. EPA by certified mail at least thirty (30) days prior to any conveyance, of the property owner's intent to convey any interest in the property and of the provisions made for the continued operation of the monitoring wells, treatment facilities, or other response actions installed pursuant to this Agreement.

C. If, after using its best efforts as provided above, DOE shall have failed to obtain voluntary access, DOE shall utilize its authority to issue an Administrative Order providing for such access as may be required or shall refer the access issue to the Department of Justice. Such referral shall request a judicial order providing for such access as may be required. U.S. EPA shall assist in obtaining access by providing testimony or documents or in other ways, as appropriate.

D. If DOE is unable to secure access to said property within thirty (30) days prior to the commencement of the scheduled activity, it shall immediately notify U.S. EPA. Within fifteen (15) days of any such notice, DOE shall propose appropriate modification(s) required by its such inability to obtain access.

XXVI. FIVE YEAR REVIEW

If a remedy is selected for the Site which results in any hazardous substances, pollutants or contaminants remaining on the Site, DOE agrees that U.S. EPA shall, consistent with Section 121(c) of CERCLA, and in accordance with this Agreement, review the Remedial Action no less often than each five years after the initiation of such Remedial Action to assure that human health and the environment are being protected by the Remedial Action implemented. If upon such review it is the judgement of U.S. EPA that additional action or modification of the Remedial Action relative to FUSRAP Waste is appropriate in accordance with Section 104 or 106 of CERCLA, U.S. EPA shall require, subject to dispute resolution, DOE to implement such additional or modified action.

XXVII. OTHER CLAIMS

A. Nothing in this Agreement shall constitute or be construed as a bar or release by either U.S. EPA or DOE from any claim, cause of action or demand in law or equity by or against any person, firm, partnership or corporation not a signatory to this Agreement for any liability it may have arising out of or

relating in any way to the generation, storage, treatment, handling, transportation, release, or disposal of any hazardous substances, pollutants, or contaminants found at, taken to, or taken from the Site.

B. This Agreement does not constitute any decision or preauthorization by U.S. EPA of funds under Section 111(a)(2) of CERCLA for any person, agent, contractors or consultant acting for DOE.

C. U.S. EPA shall not be held as a party to any contract entered into by DOE to implement the requirements of this Agreement.

D. This Agreement shall not restrict U.S. EPA from taking any legal or response action for any matter not specifically part of the work covered by this Agreement.

E. None of the facts related herein shall be considered admissions by any Party with respect to any unrelated claims by a Party or by persons not a Party to this Agreement.

F. U.S. EPA and DOE shall provide a copy of this Agreement to appropriate contractors, subcontractors, laboratories, and consultants retained to conduct any portion of the work performed pursuant to this Agreement prior to beginning work to be conducted under this Agreement.

XXVIII. OTHER APPLICABLE LAWS

A. All actions required to be taken pursuant to this Agreement shall be undertaken in accordance with the requirements of all applicable state and federal laws and regulations to the extent required by CERCLA.

B. All reports, documents, plans, specifications, and schedules submitted pursuant to this Agreement are, upon approval by U.S. EPA, incorporated into this Agreement. Any non-compliance with such U.S. EPA-approved reports, plans, specifications or schedules shall be considered a failure to achieve compliance with the requirements of this Agreement, subject to dispute resolution.

C. Studies and/or tests will be conducted on the storage pile to demonstrate compliance with the radon emission standards of the Clean Air Act. The results of these studies and/or tests, as well as any additional monitoring or reporting conducted to demonstrate continued compliance, will be included as part of the periodic reporting required hereunder.

XXIX. CONFIDENTIAL INFORMATION

In accordance with 40 CFR Part 2, DOE may assert a confidentiality claim covering all or part of the information requested by this Agreement except that analytical data shall not be claimed as confidential by DOE. Information, records, or other documents produced by DOE which are classified within the meaning of and in conformance with the Atomic Energy Act of 1954, as amended, shall not be available to the public. In addition, if so designated, data, documents, records, or files which could otherwise be withheld pursuant to the Freedom of Information Act (FOIA), 5 U.S.C., Subsection 552, or the Privacy Act of 1974 (5 U.S.C. Subsection 552a), unless expressly authorized for release by the originating party, shall be handled in accordance with those regulations.

Information determined to be confidential by U.S. EPA pursuant to 40 CFR Part 2 shall be afforded the protection specified therein. Should U.S. EPA determine that any information claimed by DOE to be confidential is not entitled to confidential treatment, DOE shall be afforded the rights and opportunities set forth in 40 CFR Part 2 to contest such determination. If no claim of confidentiality accompanies the information when it is submitted to U.S. EPA, the information may be made available to the public without further notice to DOE.

Other affected parties (e.g. Remedial Action contractors, Potentially Responsible Parties (PRPs), etc.) may assert a confidentiality claim covering all or part of any information requested under this Agreement. Such claims will be afforded the same protection pursuant to 40 CFR Part 2 as provided DOE.

No document marked draft may be made available to the public without prior agreement of the generating party.

XXX. AMENDMENT OF AGREEMENT AND ATTACHMENTS

A. This Agreement may be amended by a written agreement between DOE and U.S. EPA. Such amendments shall be in writing and shall have as the effective date that date on which such amendments are signed by all Parties, with U.S. EPA signing last, provided, except for changes in the schedules to be submitted hereunder, that, where applicable, public participation as specified in §117 of CERCLA shall be satisfied prior to signing by U.S. EPA.

B. No written or oral informal advice, guidance, suggestions or comments by U.S. EPA regarding reports, documents, plans, specifications, schedules, and any other writing submitted by DOE will be construed as modifying this Agreement or as relieving DOE of its obligation to obtain approvals as may be required by this Agreement.

C. The Attachments to this Agreement may be revised, subject to dispute resolution, by written agreement. Such revisions shall be in writing and shall be effective as of the date on which such revisions are signed by both Parties. The DOE Project Manager shall sign any revision of any Attachment to this Agreement for DOE. The Chief of the Program Support Branch, Emergency and Remedial Response Division, shall sign any revision of any Attachment to this Agreement for U.S. EPA.

D. If any provision of this Agreement is determined to be invalid, illegal or unconstitutional, the remainder of the Agreement shall not be affected by such determination.

XXXI. COVENANT NOT TO SUE AND RESERVATION OF RIGHTS

A. In consideration of DOE's compliance with this Agreement, and based on the information known to the Parties on the effective date of this Agreement, the Parties agree that compliance with this Agreement shall stand in lieu of any administrative, legal and equitable remedies against DOE available to them regarding the currently known release or threatened release of FUSRAP Waste at the Site which are the subject of the RI/FS and which will be addressed by the Remedial Action provided for under this Agreement; except that nothing in this Agreement shall preclude U.S. EPA from exercising any administrative, legal and equitable remedies available to it to require additional response actions by DOE in the event that: (1) conditions previously unknown or undetected by U.S. EPA arise or are discovered at the Site; or (2) U.S. EPA receives additional information not previously available concerning the premises which it employed in reaching this Agreement, and (3) the implementation of the requirements of this Agreement is no longer protective of public health or welfare or the environment.

B. This Covenant Not To Sue does not affect any claims for natural resource damage assessments or for damages to natural resources.

XXXII. STIPULATED PENALTIES

A. In the event that DOE fails to submit a primary document as identified in Part XIV to U.S. EPA pursuant to the appropriate Timetable or Deadline in accordance with the requirements of this Agreement, or any extension granted pursuant to this Agreement, or fails to comply with a term or condition of this Agreement which relates to Operable Units or final Remedial Action, U.S. EPA may assess a stipulated penalty against DOE. A stipulated penalty may be assessed in an amount not to exceed \$5,000 for the first week (or part thereof), and \$10,000 for each additional

week (or part thereof) for which a failure set forth in this Paragraph occurs.

B. Upon determining that DOE has failed in a manner set forth in Paragraph A, U.S. EPA shall so notify DOE in writing. If the failure in question is not already subject to dispute resolution at the time such notice is received, DOE shall have fifteen (15) days after receipt of the notice to invoke dispute resolution on the question of whether the failure did in fact occur. DOE shall not be liable for the stipulated penalty assessed by U.S. EPA if the failure is determined, through the dispute resolution process, not to have occurred. No assessment of a stipulated penalty shall be final until the conclusion of dispute resolution procedures related to the assessment of the stipulated penalty.

C. The DOE annual reports to Congress required by Section 120(e)(5) of CERCLA shall include, with respect to each final assessment of a stipulated penalty against DOE under this Agreement, each of the following:

1. The facility responsible for the failure;
2. A statement of the facts and circumstances giving rise to the failure;
3. A statement of any administrative or other corrective action taken at the relevant facility, or a statement of why such measures were determined to be inappropriate;
4. A statement of any additional action taken by or at the facility to prevent recurrence of the same type of failure; and
5. The total dollar amount of the stipulated penalty assessed for the particular failure.

D. Stipulated penalties assessed pursuant to this Part shall be payable to the Hazardous Substances Response Trust Fund from funds authorized and appropriated for that specific purpose.

E. In no event shall this Part give rise to a stipulated penalty in excess of the amount set forth in Section 109 of CERCLA, 42 U.S.C. §9609.

F. This Part shall not affect DOE's ability to obtain an extension of a Timetable, Deadline or schedule pursuant to Part XXXIII (Extensions) of this Agreement.

G. Nothing in this Agreement shall be construed to render any officer or employee of DOE personally liable for the payment of any stipulated penalty assessed pursuant to this Part.

XXXIII. EXTENSIONS

A. Either a Timetable and Deadline or a schedule shall be extended upon receipt of a timely request for extension and when good cause exists for the requested extension. Any request for extension by DOE shall be submitted at least ten (10) days prior to the Deadline or scheduled deliverable or review date in writing to U.S. EPA and shall specify:

1. The Timetable and Deadline or the schedule that is sought to be extended;
2. The length of the extension sought;
3. The good cause(s) for the extension; and
4. Any related Timetable and Deadline or schedule that would be affected if the extension were granted.

B. Good cause exists for an extension when sought in regard to:

1. An event of force majeure;
2. A delay caused by another Party's failure to meet any requirement of this Agreement;
3. A delay caused by the good faith invocation of dispute resolution or the initiation of judicial action;
4. A delay caused, or which is likely to be caused, by the grant of an extension in regard to another Timetable and Deadline or schedule; and
5. Any other event or series of events mutually agreed to by the Parties as constituting good cause.

C. Absent agreement of the Parties with respect to the existence of good cause, DOE may seek and obtain a determination through the dispute resolution process that good cause exists.

D. Within seven (7) days of receipt of a request for an extension of a Timetable and Deadline or a schedule, U.S. EPA shall advise all the Parties in writing of its respective position on the request. Any failure by U.S. EPA to respond within the 7-day period shall be deemed to constitute concurrence in the request for extension. If U.S. EPA does not concur in the requested extension, it shall include in its statement of nonconcurrence an explanation of the basis for its position.

E. If DOE and U.S. EPA agree that the requested extension is warranted, DOE shall extend the affected Timetable and Deadline or schedule accordingly. If DOE and U.S. EPA do not agree as to

whether all or part of the requested extension is warranted, the Timetable and Deadline or schedule shall not be extended except in accordance with determination resulting from the dispute resolution process.

F. Within seven (7) days of receipt of a statement of nonconcurrence with the requested extension, DOE may invoke dispute resolution. If DOE does not invoke dispute resolution within seven (7) days of receipt of a statement of nonconcurrence, then the existing schedule remains in force.

G. A timely and good faith request for an extension shall toll any assessment of stipulated penalties or application for judicial enforcement of the affected Timetable and Deadline or schedule until a decision is reached on whether the requested extension will be approved. If dispute resolution is invoked and the requested extension is denied, stipulated penalties may be assessed and may accrue from the date of the original Timetable, Deadline or schedule. Following the grant of an extension, an assessment of stipulated penalties or an application for judicial enforcement may be sought only to compel compliance with the Timetable and Deadline or schedule as most recently extended.

H. For extension requests by U.S. EPA, if no Party invokes dispute resolution within fourteen days after notice of the requested extension, the extension shall be deemed approved.

XXXIV. TRANSFER OF PROPERTY

In the event DOE enters into any contract for the sale or transfer of any of the Site, DOE will comply with the requirements of CERCLA §120(h), 42 U.S.C. §9620(h), in effectuating that sale or transfer, including all notice requirements. In addition, DOE shall include notice of this Agreement in any document transferring ownership or operation of the Site to any subsequent owner and/or operator of any portion of the Site and shall notify U.S. EPA of any such sale or transfer at least ninety (90) days prior to such transfer. No change in ownership of the Site or any portion thereof, or notice pursuant to Section 120(h)(3)(B) of CERCLA, 42 U.S.C. §9620(h)(3)(B), shall relieve DOE of its obligation to perform pursuant to this Agreement. No change of ownership of the Site or any portion thereof shall be consummated by DOE without provision for continued maintenance of any containment system, treatment system, monitoring system, or other response action(s) installed or implemented pursuant to this Agreement.

XXXV. PUBLIC PARTICIPATION

A. The Parties agree that this Agreement and all work, including the proposed Remedial Action plan and any subsequent plan for Remedial Action at the Site arising out of this Agreement shall comply with the administrative record and public participation requirements of Sections 113 and 117 of CERCLA, the NCP, and U.S. EPA guidance with respect to public participation and administrative records, and all applicable state laws.

B. DOE shall develop and implement a Community Relations Plan (CRP) which responds to the need for an interactive relationship with all interested community elements, both on- and off-site, regarding activities and elements of work undertaken by DOE. DOE agrees to develop and implement the CRP in a manner consistent with Section 117 of CERCLA, the NCP, U.S. EPA guidelines set forth in U.S. EPA's Community Relations Handbook, and any modifications thereto. The CRP is subject to the review and comment process set forth in Part XIV of this Agreement.

C. Any Party issuing a formal press release to the media regarding any of the work required by this Agreement shall advise the other Parties of such press release and the contents thereof, at least two (2) business days before the issuance of such press release and shall advise the other Party of any changes prior to release.

D. Technical Assistance Grants (TAGs). The Parties agree to address this section at a later date to reflect policies and procedures developed by EPA pursuant to Section 117 of CERCLA.

E. Technical Review Committee (TRC). The Parties agree to address this section at a later date subsequent to an evaluation of existing institutional structures, political entities, and other state and public activities to determine the most appropriate public participation mechanism and to amend the section if appropriate.

F. Administrative Record. DOE agrees it shall establish and maintain an administrative record in accordance with Section 113(k) of CERCLA. The administrative record shall be established and maintained in accordance with current and future U.S. EPA policy and guidelines. The establishment and maintenance of the Administrative Record shall specifically include the following:

- (1) The Administrative Record shall be available to the public at or near the Site. In addition, copies of the current index to the Administrative Record and selected documents from the Administrative Record shall be made available at the Maywood Public Library.

- (2) The selection of each response action shall be based on the Administrative Record, in accordance with CERCLA §113(k), any regulations promulgated pursuant thereto and applicable guidance. A copy of the Administrative Record or a complete index of the Administrative Record shall be maintained at the U.S. EPA Region II Office, currently at 26 Federal Plaza, New York, New York.
- (3) DOE shall provide U.S. EPA with copies of documents generated or possessed by DOE which are included in the Administrative Record. U.S. EPA will provide DOE with copies of documents generated by each Party which should be included in the Administrative Record.
- (4) Upon establishment of an Administrative Record, DOE shall provide U.S. EPA with an index of the Administrative Record. The index shall identify the documents which will comprise the Administrative Record for each decision document for each particular response action.
- (5) DOE shall provide U.S. EPA with a quarterly update of any documents added to the Administrative Record and the updated Administrative Record index when any changes or additions to the Record have been made.
- (6) U.S. EPA will provide DOE with guidance on establishing and maintaining the Administrative Record as this guidance develops.

XXXVI. PUBLIC COMMENT

A. Within fifteen (15) days of the date of the execution of this Agreement, the Parties shall jointly announce the availability of this Agreement to the public for review and comment. U.S. EPA shall accept comments from the public for a period of forty-five (45) days after such announcement. At the end of the comment period, U.S. EPA shall review all such comments and shall either:

- (1) Determine that the Agreement should be made effective in its present form, in which case all Parties shall be so notified in writing, and the Agreement shall become effective on the date DOE receives such notice; or
- (2) Determine that modification of the Agreement is necessary, in which case the Parties shall meet to discuss and agree upon any proposed changes. Upon agreement on any proposed changes, U.S. EPA shall notify all Parties in writing.

B. In the event of significant revision or public comment, the notice procedures of Section 117 of CERCLA shall be followed and a responsiveness summary shall be published by U.S. EPA.

XXXVII. ENFORCEABILITY

A. The Parties agree that:

(1) Upon the effective date of this Agreement, any standard, regulation, condition, requirement or order which has become effective under CERCLA and is incorporated into this Agreement is enforceable by any person pursuant to Section 310 of CERCLA, and any violation of such standard, regulation, condition, requirement or order will be subject to civil penalties under Sections 310(c) and 109 of CERCLA; and

(2) All Timetables or Deadlines associated with the development, implementation and completion of the RI/FS shall be enforceable by any person pursuant to Section 310 of CERCLA, and any violation of such Timetables or Deadlines will be subject to civil penalties under Sections 310(c) and 109 of CERCLA;

(3) All terms and conditions of this Agreement which relate to Operable Units or final Remedial Actions, including corresponding Timetables, Deadlines or schedules, and all work associated with the Operable Units or final Remedial Actions, shall be enforceable by any person pursuant to Section 310(c) of CERCLA, and any violation of such terms or conditions will be subject to civil penalties under Sections 310(c) and 109 of CERCLA; and

(4) Any final resolution of a dispute pursuant to Part XV of this Agreement which establishes a term, condition, Timetable, Deadline or schedule shall be enforceable by any person pursuant to Section 310(c) of CERCLA, and any violation of such term, condition, Timetable, Deadline or schedule will be subject to civil penalties under Sections 310(c) and 109 of CERCLA.

B. Nothing in this Agreement shall be construed as authorizing any person to seek judicial review of any action or work where review is barred by any provision of CERCLA, including Section 113(h) of CERCLA.

C. Each Party shall have the right to enforce the terms of this Agreement.

XXXVIII. TERMINATION

Except as provided in Part XXVI hereof (Five Year Review), this Agreement shall terminate upon the issuance by U.S. EPA of a Certification of Completion. U.S. EPA shall issue a Certification of Completion within ninety (90) days of the written request by DOE, which request shall be accompanied by information and data sufficient for U.S. EPA to prepare a Close Out Report demonstrating that all Remedial Actions have been completed and that any hazardous substances remaining at the Site

do not pose a substantial risk to public health, welfare or the environment, in accordance with OSWER Directive 9320.2-03A, "Procedures for Completion and Deletion of NPL Sites" and any subsequent revisions thereof. The Certificate shall state that, in the opinion of U.S. EPA, DOE has satisfied all of the terms of this Agreement in accordance with the requirements of CERCLA, the NCP and all related regulations and guidance, and applicable state laws, and that the work performed by DOE was consistent with the agreed upon Remedial Actions.

XXXIX. EFFECTIVE DATE

This Agreement is effective upon issuance of a notice to the Parties by U.S. EPA in accordance with Part XXXVI (Public Comment).

XL. FUNDING

It is the expectation of the Parties to this Agreement that all obligations of DOE arising under this Agreement will be fully funded. DOE shall take all necessary steps and make efforts to obtain timely funding to meet its obligations under this Agreement.

DOE is preparing an Environmental Restoration and Waste Management Five Year Plan (the "Five Year Plan") to identify, integrate and prioritize DOE's compliance and cleanup activities at all DOE nuclear facilities and sites. The Five Year Plan will assist in addressing environmental requirements at its facilities and sites and in developing and supporting its budget requests. DOE will update its Five Year Plan on an annual basis.

The terms of the Five Year Plan shall be consistent with the provisions of this Agreement, including all requirements and schedules contained herein; it is the intent of the Parties that DOE's Five Year Plan be drafted and updated in a manner that ensures that the provisions of this Agreement are incorporated into the DOE planning and budget process. Nothing in the Five Year Plan shall be construed to affect the provisions of this Agreement.

DOE is developing a national prioritization system for inclusion in its Five Year Plan. DOE's application of its national prioritization system may indicate to DOE that amendment or modification of the provisions and/or milestones established by this Agreement is appropriate. In that event, DOE may request, in writing, amendment or modification of this Agreement, including deadlines established herein. Where the Parties are unable to reach agreement on a requested amendment or modification, DOE may invoke the dispute resolution provisions of

this Agreement. Pending resolution of any such dispute, the provisions and deadlines in effect pursuant to this Agreement shall remain in effect and enforceable in accordance with the terms of this Agreement. Any amendment or modification of this Agreement will be incorporated, as appropriate, in the annual update to DOE's Five Year Plan.

In accordance with Section 120(e)(5)(B) of CERCLA, 42 U.S.C. §9620(e)(5)(B), DOE shall include in its annual report to Congress the specific cost estimates and budgetary proposal associated with the implementation of this Agreement.

Any requirement for the payment or obligation of funds, including stipulated penalties, by DOE established by the terms of this Agreement shall be subject to the availability of appropriated funds, and no provision herein shall be interpreted to require obligation or payment of funds in violation of the Anti-Deficiency Act, 31 U.S.C. §1341. In cases where payment or obligation of funds would constitute a violation of the Anti-Deficiency Act, the dates established requiring the payment or obligation of such funds shall be appropriately adjusted. If appropriated funds are not available to fulfill DOE's obligations under this Agreement, U.S. EPA reserves the right to initiate any other action which would be appropriate absent this Agreement.

Nothing herein shall affect DOE's authority over its budget and funding level submissions.

The Parties recognize that EPA must possess adequate resources to meet its commitments established by this Agreement. So that activities to be performed pursuant to this Agreement may proceed, U.S. EPA agrees to reprogram existing FY90 resources to fulfill its FY90 commitments established by this Agreement. The Parties agree that during FY90, the Parties will explore any possible alternatives which may be available to ensure that adequate resources are available to EPA to fulfill its commitments established by this Agreement.

Notwithstanding any other provision of this Agreement, in the event that EPA determines that adequate resources are not available to meet any post-FY90 commitments established by this Agreement, EPA may terminate this Agreement by written notice to DOE.

EPA reserves any rights it may have to seek or obtain reimbursement of any funds expended by EPA at the Site to the extent authorized by CERCLA; nothing herein shall prejudice EPA's ability to exercise any right to reimbursement provided for by CERCLA.

XLI. FORCE MAJEURE

A Force Majeure shall mean any event arising from causes beyond the control of a Party that causes a delay in or prevents the performance of any obligation under this Agreement, including, but not limited to, acts of God; fire; war; insurrection; civil disturbance; explosion; unanticipated breakage or accident to machinery, equipment or lines of pipe despite reasonably diligent maintenance; adverse weather conditions that could not be reasonably anticipated; unusual delay in transportation; restraint by court order or order of public authority; inability to obtain, at reasonable cost and after exercise of reasonable diligence, any necessary authorizations, approvals, permits or licenses due to action or inaction of any governmental agency or authority other than DOE; delays caused by compliance with applicable statutes or regulations governing contracting, procurement or acquisition procedures, despite the exercise of reasonable diligence; and insufficient availability of appropriated funds, if DOE shall have made timely request for such funds as part of the budgetary process as set forth in Part XL (Funding) of this Agreement. A Force Majeure shall also include any strike or other labor dispute, whether or not within the control of the Parties affected thereby. Force Majeure shall not include increased costs or expenses of Response Actions, whether or not anticipated at the time such Response Actions were initiated.

XLII. INTERFACING WITH OTHER MAYWOOD RI/FS PROJECTS

A. The Parties agree that the RI/FS activities shall be fully coordinated with the other independent RI/FS projects currently being conducted in the Maywood area. The coordination will include, but not be limited to:

- (1) RI activities, e.g. characterization of contamination, ground water flow and contaminant migration;
- (2) Removal Actions on areas covered by multiple RI/FS actions; and
- (3) RD/RA activities or work elements for overlapping areas.

B. U.S. EPA agrees that it shall keep DOE, and any other person undertaking RI/FS activities, informed of all planned activities which may require coordination and shall facilitate the exchange of all relevant information among U.S. EPA, DOE and such other persons. U.S. EPA shall serve as the official arbiter of any conflicts which may arise in connection with planned field activities and may propose modifications to schedules in order to minimize conflicts and maximize benefits. Within ten (10) days of receipt of notice of a proposed change in a scheduled activity from any other party, U.S. EPA will advise all other persons of

such proposed change and identify any anticipated impacts on other RI/FS activities.

C. DOE agrees that it shall provide any and all appropriate information requested through the U.S. EPA to support any other RI/FS in the Maywood area and that they will notify the U.S. EPA when the possibility arises that a planned activity or work element may impact another Maywood area RI/FS project.

XLIII. EXECUTION OF DOCUMENT

Each undersigned representative of a Party certifies that he or she is fully authorized to enter into the terms and conditions of this Agreement and to legally bind such a Party to this Agreement.

IT IS SO AGREED:

Date

FOR THE U.S. DEPARTMENT OF ENERGY
Joe LaGrone
Manager
Oak Ridge Operations
U.S. Department of Energy

Date

FOR THE U.S. ENVIRONMENTAL PROTECTION
AGENCY
Constantine Sidamon-Eristoff
Regional Administrator, Region II
U.S. Environmental Protection Agency

ATTACHMENT 1

DESCRIPTION OF PROPERTY

Beginning at the point of intersection of the southerly line of the New York Susquehanna and Western Railroad and the easterly line of the New Jersey State Highway Rt. 17 and running thence;

1. Southeasterly on a curve to the right having a radius of 2814.93' along the southerly line of the New York Susquehanna and Western Railroad an arc distance of 1187.50' to a point, thence;
2. S 41° 18' 03" W 248.75' to a point, thence;
3. N 48° 33' 57" W 579.16' to a point, thence;
4. S 45° 17' 45" W 244.92' to a point located on the easterly line of a 30' sanitary sewer easement running parallel to the Borough line between the Borough of Maywood and the Township of Rochelle Park as described in a deed recorded in the Bergen County Clerk's Office, book 4198, page 198, thence;
5. S 12° 49' 28" W 400.86' along said easement line to a point, thence;
6. S 79° 21' 00" W 209.85' to a point on the northeasterly line of the New Jersey State Highway Rt. 17, thence;
7. N 10° 39' 00" W 49.34' along said northeasterly line of Rt. 17 to a point of curvature, thence;
8. Still along said line of the New Jersey State Highway Rt. 17 northwesterly and then northeasterly on a curve to the right having a radius of 1870.08' an arc distance of 949.12' to a point of tangency, thence;
9. N 18° 25' 45" E 52.51' to the point or place of beginning.

Said parcel containing 11.71 acres.

ATTACHMENT 2

DELIVERABLES

The deliverables and number of copies of each deliverable to be furnished by DOE pursuant to this Agreement are as follows:

1. RI/FS WORKPLAN (10 copies): The Remedial Investigation/Feasibility Study (RI/FS) Workplan will describe the organization of the project, identify the appropriate administrative guidance, and outline the elements of work planned to complete the Remedial Investigation and Feasibility Study in accordance with CERCLA. The document will be consistent with CERCLA, the NCP, the Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, EPA, Interim Final, October, 1988, any subsequent revisions thereof (where such revisions are provided to DOE prior to submittal of the subject deliverable), and any other applicable or relevant EPA guidance. The RI/FS workplan will include the Sampling and Analysis Plan.
2. QUALITY ASSURANCE PROJECT PLAN (10 copies): The Quality Assurance Project Plan (QAPP) will meet CERCLA guidance by defining data objectives, establishing sampling criteria, and incorporating a set of Standard Operational Procedures (SOPs) to meet those goals. The QAPP will be developed in accordance with the Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, EPA, Interim Final, October, 1988, any subsequent revisions thereof, (where such revisions are provided to DOE prior to submittal of the subject deliverable), the Compendium of Superfund Field Operations Methods, EPA, December, 1987, the Region II: CERCLA Quality Assurance Manual, EPA, March, 1988, and any other applicable or relevant EPA guidance.
3. COMMUNITY RELATIONS PLAN (10 copies): Following CERCLA guidance, the Community Relations Plan (CRP) provides a framework for presenting understandable and consistent information to interested parties during the RI, the FS, and Remedial Actions at the Site. The CRP documents the history of community involvement and community concerns regarding the Site, and provides an explanation of the Community Relations Program. It is meant to assist DOE in determining the concerns of the community while informing the community about all aspects of DOE's environmental restoration activities at the Site. Implementation of the CRP ensures that all concerned parties are involved in the CERCLA process in a meaningful manner. The CRP will be consistent with CERCLA, the NCP, the Community Relations in Superfund: A Handbook, Interim Version, EPA, June, 1988, any revisions thereof, (where such revisions are provided to DOE prior to

submittal of the subject deliverable), and any other applicable or relevant EPA guidance.

4. BASELINE PUBLIC HEALTH RISK ASSESSMENT (10 copies): Through the identification of potential pathways, appropriate solute transport modeling, and the use of available toxicological data, the Baseline Public Health Risk Assessment analyzes the potential risks to the public for the "no action" alternative. The document will be consistent with the Risk Assessment Guidance for Superfund, Interim Final, December, 1989, and any other applicable or relevant EPA guidance.

5. REMEDIAL INVESTIGATION (10 copies): This report will be consistent with CERCLA, the NCP, the Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, EPA, Interim Final, October, 1988, any subsequent revisions thereof, (where such revisions are provided to DOE prior to submittal of the subject deliverable), the Compendium of Superfund Field Operations Methods, EPA, December, 1987, and any other applicable or relevant EPA guidance.

6. FEASIBILITY STUDY (10 copies): This report will be consistent with CERCLA, the NCP, the Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, EPA, Interim Final, October, 1988, any subsequent revisions thereof (where such revisions are provided to DOE prior to submittal of the subject deliverable), and any other applicable or relevant EPA guidance.

7. FINAL RI/FS (10 copies): This document comprises the separate RI and FS reports after incorporation of all comments pursuant to Part XIV (Consultation) or resolution of disputes pursuant to Part XV (Dispute Resolution).

8. PROPOSED REMEDIAL ACTION PLAN (10 copies): This document draws from the information in the RI/FS and is designed to identify the preferred alternative and the rationale for its choice, for the purpose of public participation. The document is equivalent to the Proposed Plan as that term is used in CERCLA §117 and as such is subject to a formal public review period and subsequent public hearing. The document shall be consistent with CERCLA, the NCP, the draft Guidance on Preparing Superfund Decision Documents: The Proposed Plan and Record of Decision, EPA, Draft, March, 1988, any subsequent revisions thereof (where such revisions are provided to DOE prior to submittal of the subject deliverable), and any applicable or relevant EPA guidance.

9. RECORD OF DECISION (10 copies): The Record of Decision (ROD) will document the final remedy(ies) selected for the Site. The ROD must be based on the material contained within the Administrative Record. It will include a responsiveness summary

which addresses major comments, concerns, criticisms, or new data raised during the comment period on the Proposed Remedial Action Plan, including those that may have led to significant changes from the proposal(s) contained in the Proposed Remedial Action Plan. The ROD shall be consistent with CERCLA, the NCP, the draft Guidance on Preparing Superfund Decision Documents: The Proposed Plan and Record of Decision, EPA, Draft, March, 1988, any subsequent revisions thereof (where such revisions are provided to DOE prior to submittal of the subject deliverable), and any applicable or relevant EPA guidance, and shall describe, as stated in §121 of CERCLA, a remedy(ies) that:

- A. Is protective of human health or welfare or the environment,
- B. Attains all ARARs or provides the grounds for invoking one of the waivers CERCLA provides,
- C. Is cost-effective, and
- D. Utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practical.

10. REMEDIAL DESIGN (5 copies): The Remedial Design (RD) will provide detailed engineering design and specifications which will allow the Parties an opportunity to review and comprehend all aspects of the selected remedy(ies).

11. REMEDIAL ACTION IMPLEMENTATION PLAN (5 copies): This plan will establish a schedule of planned actions to implement the ROD. To the degree feasible it will document engineering decisions or the decision process, including the nature of on-going investigations, studies or tests. The plan will provide a detailed list of deliverables and Timetables and schedules with sufficient detail to enable comprehensive understanding of the upcoming implementation of the selected remedy(ies).

ATTACHMENT 3

SITE SCHEDULE

This Attachment will provide the official schedule agreed to by all Parties for the activities and deliverables governed by this Agreement. This schedule will be developed and attached to this Agreement within forty-five (45) days of the effective date of this Agreement as described in Part XVI (Project Schedules).

APPENDIX G
DEFINITIONS OF CAUSAL FACTORS

DEFINITIONS OF CAUSAL FACTORS

POLICY

Evaluate if ineffective, outdated, or nonexistent policies contributed to the finding.

POLICY IMPLEMENTATION

Ascertain if written policies reflecting Federal, state, and local laws and regulations, codes, and standards were appropriately disseminated, implemented, and updated. If not, evaluate if this is a contributing factor to the finding.

RISK

Evaluate if the site personnel responsible for a situation contributing to a finding have assessed and were aware of the relative degree of risk involved in the action.

PROCEDURES

Identify if written procedures that have been prepared to effectively implement site policy, DOE Orders, and Federal, state, and local laws and regulations were a contributing factor to the finding. Determine if unfamiliarity with or unavailability of those procedures contributed to the finding.

PERSONNEL

Identify if the educational and work experience backgrounds of personnel holding responsible positions contributed to the finding. Determine if the level of personnel knowledge about the technical and safety aspects of their jobs contributed to the finding.

RESOURCES

Ascertain if the number of personnel assigned to a job was a contributing factor in the finding. Evaluate if inadequacies in facilities and equipment were a contributing factor to the finding.

TRAINING

Identify if adequate personnel training on implementing site policy, DOE Orders, and applicable Federal, state, and local laws and regulations was a contributing factor to the finding.

CHANGE

Evaluate if changes in site mission, function, operation and established requirements, which rendered existing policies or procedures inadequate or inappropriate were contributing factors to the finding. Evaluate if the timeliness and effectiveness of changes to site and DOE policy, and the implementing procedures, were a contributing factor to the finding.

APPRAISALS, AUDITS, AND REVIEWS

Determine if ineffective or insufficient appraisals, audits, and reviews, and/or inadequate followup, were contributing factors to the finding.

DESIGN

Evaluate if inadequate design of a system was a contributing factor to the finding.

HUMAN FACTORS

Ascertain if human factors, such as fatigue or deliberate circumvention of a safety system, were contributing factors to the finding.

BARRIERS AND CONTROLS

Determine if inadequacies in established barriers and controls, both administrative and physical, including operational readiness, routine inspections and preventive maintenance, and/or a lack of these controls, contributed to the finding.

SUPERVISION

Identify if ineffective supervisory controls for implementing policies, procedures, standards, laws, etc. were a contributing factor to the finding.

END

DATE FILMED

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