Engineering Evaluation/Cost Analysis for a Removal Action in Support of NJDOT Roadway Improvement Projects at the FUSRAP Maywood Superfund Site (FMSS)

Maywood, New Jersey

July 2001

US Army Corps
of Engineers®
New York District
Formerly Utilized Sites Remedial Action Program

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prepared by
U.S. Army Corps of Engineers, New York District Office, Formerly Utilized Sites Remedial Action Program

with technical assistance from
Stone & Webster, Inc.
Under Contract No. DACW41-99-D-9001

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FOREWORD

This engineering evaluation/cost analysis (EE/CA) has been prepared in support of a proposed removal action to address radiologically contaminated soil and debris from selected properties at the Formerly Utilized Sites Remedial Action Program (FUSRAP) Maywood Superfund Site ("FMSS" or the "Site") in Bergen County, New Jersey. The Site consists of properties in the Boroughs of Maywood and Lodi and the Township of Rochelle Park, New Jersey. The U.S. Army Corps of Engineers (USACE) is the lead agency for radioactive cleanup activities at the Site under its FUSRAP. FUSRAP responsibilities for the (Maywood Chemical Company) Site were defined in the Federal Facility Agreement between the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Energy (DOE), predecessor agency to USACE for FUSRAP implementation.

Response actions at the Site are being conducted in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA). USACE is preparing a comprehensive feasibility study (FS) for cleanup of the Site. The DOE previously issued the remedial investigation (RI) report. The proposed removal action evaluated in this EE/CA is consistent with the overall cleanup strategy for the Site, and will not limit the choice of reasonable alternatives or prejudice the ultimate decision for which the FS is being prepared.

The proposed action is to address areas at the Site that will be affected by the New Jersey Department of Transportation's (NJDOT's) planned roadway improvements. If NJDOT changes the area it affects or impacts with its roadway improvement activities, the area addressed by the proposed USACE removal may also change. If NJDOT impacts additional areas at the Site containing FUSRAP contamination, such areas might be addressed by the USACE removal. If NJDOT modifies its plans eliminating areas from its plan before USACE completes its removal, then such areas would not be addressed by the USACE removal.

The proposed removal action would involve the excavation of radiologically contaminated soil and debris from areas impacted by the NJDOT roadway improvements, and would transport these materials to an authorized disposal facility. An expedited response action to remove these materials (i.e., prior to remediation of the entire Site) is warranted to prevent the release of contaminants from these properties into the environment and to minimize potential exposures to human populations which might otherwise result from the roadway improvements planned by NJDOT, if the NJDOT work were to be conducted before the contaminated soil has been cleaned up. Addressing soil contamination on properties impacted by NJDOT construction may also reduce the total volume of contaminated soil to be addressed at the site because roadway construction prior to cleanup could spread the contamination. The removal action is necessary to assure that USACE completes removal cleanup activities ahead of NJDOT excavations into potentially contaminated soil.

Authority for responding to releases or threats of releases from a contaminated site is addressed in Section 104 of CERCLA. Under CERCLA Section 104(a)(1)(A), USACE is authorized to perform removal actions where there is a release or a threat of a release of a hazardous substance. Table 1 summarizes some of the analytical data showing contamination of soil at properties

addressed in this EE/CA with radionuclides, which are identified as CERCLA hazardous substances. The need to conduct the removal action was evaluated in terms of the eight criteria listed in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) under 40 Code of Federal Regulations (CFR) 300.415 for evaluating and selecting removal actions. If conditions at the site meet one or more of these criteria, then the NCP suggests that it may be appropriate to conduct a removal action. The removal action was found to be an appropriate measure of control based upon at least one of these criteria, as follows:

> Actual or potential exposure to nearby human populations, animals or the food chain from hazardous substances, or pollutants or contaminants [40 CFR 300.415(b)(2)(i)].

The EE/CA was prepared in accordance with the requirements of 40 CFR 300.415 when a planning period of at least 6 months is available prior to initiation of onsite activities.

This EE/CA is being submitted for public comment in accordance with the requirements of 40 CFR 300.415. USACE is especially interested in input regarding the preferred alternative and any considerations for carrying out the proposed removal action. USACE will consider all comments received during this public comment period, prior to a final decision on the removal action. The final decision, selecting a removal action, will be made in an Action Memorandum, signed by USACE after considering the comments received during the public comment period.

LIST OF ABBREVIATIONS, ACRONYMS, AND SYMBOLS

AEC	Atomic Energy Commission
ALARA	As low as reasonably achievable
ANL	Argonne National Laboratory
ARAR	Applicable or Relevant and Appropriate Requirements
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation and Liability Information System
CFR	Code of Federal Regulations
COCs	Constituents of concern
DOE	U.S. Department of Energy
EE/CA	Engineering Evaluation and Cost Analysis
EPA	U.S. Environmental Protection Agency
ERI	Environmental Resolutions, Inc.
FFA	Federal Facility Agreement
FMSS	FUSRAP Maywood Superfund Site
FS	Feasibility Study
FSS	Final Status Survey
FUSRAP	Formerly Utilized Sites Remedial Action Program
I	Interstate
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MCW	Maywood Chemical Works
MISS	Maywood Interim Storage Site
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NJ	New Jersey
NJDEP	New Jersey Department of Environmental Protection
NJDOT	New Jersey Department of Transportation
NJPDES	New Jersey Pollutant Discharge Elimination System
NPDES	National Pollutant Discharge Elimination System
NRC	Nuclear Regulatory Commission
O&M	Operation and Maintenance
OU	Operable Unit
PP	Proposed Plan
Ra-226	Radium-226
RAOs	Removal Action Objectives
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
ROW	Right-of-way
Rt.	Route
SARA	Superfund Amendments and Reauthorization Act
T&D	Transportation and disposal
Th-232	Thorium-232
U-238	Uranium-238

USACE	U.S. Army Corps of Engineers
USDOT	U.S. Department of Transportation
USFWS	U.S. Fish and Wildlife Service
WBS	Work breakdown structure

UNITS OF MEASURE

cm	centimeters
ft	feet
km	kilometers
m	meters
mi	mile
mrem/yr	millirem per year
pCi/g	picoCuries per gram
yr	year
$	dollar

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1.0 Introduction

USACE is implementing a cleanup program for properties in the Boroughs of Maywood and Lodi and the Township of Rochelle Park, New Jersey (NJ), collectively referred to as the FUSRAP Maywood Superfund Site ("FMSS" or the "Site"). The Site includes the Maywood Interim Storage Site (MISS), portions of the adjacent Stepan Company property (formerly Maywood Chemical Works, or MCW), and other vicinity properties, including numerous residential, commercial, federal, state, and municipal properties. The EPA has a database on CERCLA sites known as "Comprehensive Environmental Response, Compensation and Liability Information System" (CERCLIS). The CERCLIS name and identification number for the Site are the Maywood Chemical Company Site and NJD980529762. The EPA placed the Maywood Chemical Company Site on the National Priorities List (NPL) in 1983. As a result of past activities at the site, these properties are contaminated with the radiological hazardous substances thorium-232 (Th-232), radium-226 (Ra-226), and uranium-238 (U-238) and their radioactive decay series.

Responsibilities for response actions at the Site are defined under a Federal Facility Agreement (FFA), negotiated between DOE and the EPA Region II that became effective April 22, 1991 (EPA 1991). The FUSRAP program was subsequently transferred to the USACE in 1997. Under the terms of the FFA, FUSRAP waste is defined as:

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

- All radiological contamination above DOE's action levels related to past thorium processing from the MCW occurring on any vicinity properties; and

- Any chemical or non-radiological contamination on vicinity properties that would satisfy either of the following: (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 which originated at the MISS or were associated with specific thorium manufacturing or processing at the MCW which resulted in the radiological contamination.

1.1 Status of the Site CERCLA Process

Implementation of a comprehensive cleanup program (i.e., a remedial action) for the Site will follow the completion of the remedial investigation/feasibility study (RI/FS) process. The RI/FS process is being conducted according to the requirements of CERCLA, as amended by the SARA. The RI describes the nature and extent of radioactive materials and chemical contamination found at the Site, discusses risks associated with those materials, and identifies the constituents of concern (COCs). The FS will present and evaluate remedial action cleanup alternatives. In addition, the Proposed Plan (PP) will identify the USACE's recommendation for cleanup of FUSRAP contamination at the Site. The RI/FS process will conclude with the issuance of a

Record of Decision (ROD) that will identify the selected remedy for all soil contamination present at the Site.

For the purposes of cleaning up FUSRAP waste associated with the Site, two Operable Units (OUs) have been created. (An operable unit is a discrete portion of a CERCLA site, such as soil or groundwater. The chemical contamination at the Stepan Company property at the Site is considered a separate operable unit, which is being addressed by Stepan under EPA oversight.) The Soils OU addresses only FUSRAP waste found in the soils and buildings. The Groundwater OU involves FUSRAP waste found only in the groundwater. DOE conducted the Soils OU RI for the Site from 1989 to 1991.

The purpose of the Soils OU RI was to define the nature and extent of contamination at the Site, determine the fate and transport of contaminants, and identify remedial action objectives. Characterization of the nature and extent of any potential groundwater contamination is not complete. Additional groundwater studies are currently underway and will be documented in a groundwater RI Report.

CERCLA and the NCP also provide, and encourage when appropriate, the implementation of interim response actions prior to remedial actions, including removal actions. The NCP provides for both time-critical and nontime-critical (when at least 180 days of planning time is available) removal actions. A removal action is selected in an Action Memorandum. Some removal actions have already been implemented on this site, one begun by DOE and completed by USACE in 2000 on vicinity properties and another completed by USACE in 2000 to alleviate localized flooding associated with a swale at the site.

1.2 Proposed Removal Action

This EE/CA was prepared to clean up properties not previously addressed by either of the above-referenced removal actions at the site. This EE/CA was prepared in accordance with the requirements of 40 CFR 300.415(b)(4)(i) when a planning period of at least 6 months is available prior to initiation of onsite activities.

This EE/CA evaluates a removal action for those areas at the Site that will be affected by planned roadway improvement projects by the NJDOT. Areas at the Site are shown on Figure 1, including those areas that may be affected by NJDOT improvements (shown with different coloring). Planned roadway improvements at the Site include:

- NJ Route (Rt.) 17 and Essex Street Interchange and Drainage Improvements;
- NJ Rt. 17 Drainage Improvements; and
- Interstate (I)-80 Sound Barrier Construction.

The NJ Rt. 17 and Essex Street Interchange and Drainage Improvement project involves the removal of the Essex Street overpass, construction of a new overpass, improved ingress and egress

to NJ Rt. 17, widening of Essex Street, enhanced parking and access to properties along Essex Street, and improved drainage.

The NJ Rt. 17 Drainage Improvement project involves the placement of new stormwater piping and catch basins along NJ Rt. 17, U.S. Rt. 46, and Gregg Street in the Borough of Lodi.

The I-80 Sound Barrier Construction project involves the construction of sound barriers along the local lanes of I-80.

Several properties on the Site will be affected by the planned NJDOT work. A removal action addressing these properties (i.e., prior to remediation of the entire Site) is warranted to prevent the potential release of contaminants from these properties into the environment and the potential exposure of NJDOT employees or contractors to FUSRAP waste that may occur during the planned roadway improvements.

Authority for responding to releases or threats of releases from a contaminated site is addressed in Section 104 of CERCLA. Under CERCLA Section 104(a)(1)(A), USACE is authorized to perform removal actions where there is a release or a threat of a release of a hazardous substance. Table 1 summarizes some of the analytical data on properties addressed by this EE/CA showing contamination of soil with radionuclides that are CERCLA hazardous substances.

The NCP provides eight criteria for determining the need for removal actions in 40 CFR 300.415(b)(2)(viii). If conditions at a CERCLA site satisfy one or more of these criteria, then the NCP indicates that it may be appropriate to conduct a removal action. The appropriate criterion for the proposed removal action is:

> Actual or potential exposure to nearby human populations, animals or the food chain from hazardous substances, or pollutants or contaminants [40 CFR 300.415(b)(2)(i)].

The NJDOT has specific plans for roadway improvements, which will involve excavation into and additional construction activity on certain properties at the Site containing radioactively contaminated soil. The NJDOT expects that such improvements will affect some properties at the Site in 2001. Table 1 presents some of the available analytical data showing above background soil contamination at these properties. If NJDOT construction were to occur in advance of the cleanup of these properties, construction workers and other personnel might be exposed to the radioactive contaminants in the soil.

Also, if NJDOT roadway improvements were to occur on contaminated properties before cleanup, these activities could increase the potential for hazardous substances to migrate, including those listed in Table 1. Some migration might occur directly from the movement of contaminated soil by excavating, earth moving and other heavy equipment usage. Additional migration of contamination might also occur once contaminated soil is uncovered or brought to the surface either by the action of water falling onto or flowing across the site or by wind picking up contaminated soil and transporting it as wind-blown dust.

The FFA specifies that the lead agency, now USACE, notify the EPA of any proposed removal actions prior to implementation. The USACE has consulted with the EPA and the NJ Department of Environmental Protection (NJDEP) on the development of this EE/CA.

The proposed removal action is consistent with CERCLA and the NCP regarding 40 CFR 300.415(d), which requires that interim actions contribute to the extent practicable to the efficient performance of any anticipated final remedy. The proposed removal action is consistent with the overall cleanup strategy for the Site and will not limit the choice of reasonable alternatives that might be selected as a remedial action.

Preparation of this EE/CA and an Action Memorandum would permit the USACE to conduct removal actions at properties impacted by NJDOT's roadway improvements. The Action Memorandum will be prepared and issued following the public comment period. The Action Memorandum will document the USACE's decision based on the EE/CA, other documents contained in the Administrative Record, and consideration of regulator input and comments received during the public comment period on this EE/CA.

The EE/CA evaluates a no action alternative, an excavation and offsite disposal alternative, and an excavation, treatment, and offsite disposal alternative. The EE/CA presents evaluations expected to be consistent with the FS, PP, and RD to be developed for a soil remedial action for this site.

In general, the USACE proposes to clean up areas at the Site that are affected by the NJDOT roadway improvements to allow for unrestricted use with a soil cleanup level of an average of 5 picocuries per gram (pCi/g) for Th-232 and Ra-226 combined above background and 50 pCi/g U-238 above background. These criteria are risk-based and were originally developed by the EPA and agreed to by the DOE (predecessor to USACE in the implementation of FUSRAP) under the concept of remediating FUSRAP sites to levels "as low as reasonably achievable" (ALARA). They were subsequently adopted in the resolution of a 1993 dispute between EPA and DOE regarding soil cleanup criteria on this Site, which was resolved on June 21, 1993. These criteria were determined by EPA to be protective of human health for an unrestricted land use, and to not result in excess risk above the NCP protective range of cancer risk. Potential human exposure at these properties would be reduced because the contaminated materials would be removed from their present locations by specially trained workers and placed in an engineered facility designed for permanent disposal. Final determinations of the protectiveness of this response action will be assessed as part of the remedial action for soil to be selected in the ROD.

Although the properties addressed in this EE/CA are currently under a commercial land use, the Site is located in a heavily urbanized area with occupied residences near the properties addressed. An unrestricted cleanup criterion will be used for these properties. Although cleaning up to unrestricted land uses increases the volume of soil to be addressed on these properties, these properties contain relatively small volumes of contaminated soil, and neither the volume of soil nor the costs for overall site cleanup (e.g. all removal and remedial actions for the Site) are expected to be significantly increased and this obviates the need for potentially costly long-term engineering or institutional controls.

Radiologically contaminated soil that is currently inaccessible will be addressed by this removal action if these soils are made accessible to USACE while this removal is being conducted. Inaccessible soils are defined as soils under or in proximity to buildings or other structures (including major utilities) which if removed, could compromise the integrity of the building or structure. Utility corridors will be addressed on a case-by-case basis (whether considered inaccessible or not).

This removal action would address areas affected by NJDOT roadway improvement activities. If NJDOT changes the areas it affects or impacts with its roadway improvement activities, the area addressed by the proposed USACE removal may also change. If NJDOT impacts additional areas at the Site containing FUSRAP contamination, such areas might be addressed by the USACE removal. If NJDOT modifies its plans eliminating areas from its plan before USACE completes its removal, then such areas would not be addressed by the USACE removal.

Each area addressed in the removal action would be subject to a final status survey (FSS). The FSS would follow an approach that is consistent with those presented in the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM).

> "The MARSSIM provides information on planning, conducting, evaluating, and demonstrating building surface and surface soil final status radiological surveys for demonstrating compliance with dose or risk-based regulations or standards. The MARSSIM is a multi-agency consensus document that was developed collaboratively by four Federal agencies having authority and control over radioactive materials: Department of Defense, DOE, EPA, and NRC. The MARSSIM's objective is to describe a consistent approach for planning, performing, and assessing building surface and surface soil final status surveys to meet established dose or risk-based release criteria, while at the same time encouraging an effective use of the resources (MARSSIM 2000)."

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2.0 Site Characterization

2.1 Site Description

The Site is in a highly developed area of northeastern NJ in the Boroughs of Maywood and Lodi and the Township of Rochelle Park. The Site is located approximately 20 kilometers (km) (12 miles [mi]) north-northwest of New York City and 21 km (13 mi) northeast of Newark, NJ. The population density of this area is approximately 2,730 people/km^2 (7,000 people/mi^2). Figure 1 shows the locations of some of the properties at Site, including those properties addressed by this EE/CA.

2.2 Site Background

The original plant, which became known as the MCW after incorporation on December 24, 1918 under the laws of the State of NJ, was constructed in 1895. The principal products manufactured by MCW were chemicals used in the pharmaceutical, food, glass, soap, and metals industries (Barnum 1942). Starting in 1916, the plant was used to extract thorium and rare earth metals from monazite sands for use in manufacturing industrial products, such as mantles for gas lanterns. Thorium and rare earth metals were extracted from the monazite sands using an acidic separation process. Process wastes from the thorium extraction operations were pumped into two areas surrounded by earthen dikes on property west of the plant (Cole et al 1981). In 1932, the disposal areas were partially covered by the construction of NJ Rt. 17.

The wastes from this separation process were pumped as a slurry to holding ponds. Some of the wastes from these ponds were later transferred into the burial pits on the 100 West Hunter Avenue property. The liquid portions of the ponds containing the thorium and rare earth metals were separated from the tailings, and thorium was separated from the rare earth metals. Some concentrated thorium residues were pumped into a holding pond where the thorium portion of the residues was precipitated as a phosphate. Wastes from this holding pond were later transferred into burial pit 3 at the 100 West Hunter Avenue Property. Waste retention ponds existed on portions of MCW that now comprise the property at 96 Park Way, the MISS property, and the property at 149-151 Maywood Avenue.

Wastes from the manufacturing processes were generally stored in open piles and retention ponds on the MCW property. Some of the process wastes were removed for use as mulch and fill on nearby properties, thereby contaminating those properties with radioactive thorium (Mata 1984). Although the fill consisted primarily of tea and coca leaves from other MCW processes, these materials were apparently contaminated with the thorium-processing wastes.

Additional waste migrated off the property via natural drainage associated with the former Lodi Brook. Historical photographs and maps indicate that the former course of the brook, which originated on the MCW property at 149-151 Maywood Avenue, generally coincides with the distribution of contaminated properties in the Borough of Lodi. Most of the open stream channel in Lodi was replaced by a storm-drain system in the 1960s.

MCW stopped extracting thorium in 1956, after approximately 40 years of production. The property was subsequently sold to the Stepan Company in 1959.

In 1961, the Stepan Company was issued an Atomic Energy Commission (AEC) radioactive-materials storage license based on AEC inspections and information related to the property on the west side of NJ Rt. 17 at 96 Park Way. Stepan began to clean up residual thorium wastes. From 1966 through 1968, Stepan removed residues and tailings from the area east of NJ Rt. 17 and from the property at 96 Park Way and buried them on the 100 West Hunter Avenue property. In 1968, AEC conducted a survey of the area west of NJ Rt. 17 and certified it for use without radioactive restrictions. The Stepan property west of NJ Rt. 17 was sold in the same year to a private citizen who later sold it in the 1970s (Cole et al. 1981) to its current owner.

In January 1981, the Nuclear Regulatory Commission (NRC), a successor agency to AEC for the control of radiologically contaminated materials, had an aerial radiological survey performed for the Stepan property and surrounding properties (EG&G 1981). The survey, which covered a 10-km^2 (3.9 mi^2) area, indicated the presence of radioactivity not only on the properties at 149-151 Maywood Avenue and at 96 Park Way, but also in areas to the north and south of 96 Park Way. During February 1981, the NRC also performed a separate radiological ground survey of the property at 96 Park Way (Cole et. al. 1981), the results of which eventually led to its designation for remedial action under FUSRAP (Coffman 1983). In June, an additional radiological survey of the properties at 149-151 Maywood Avenue and at 96 Park Way, commissioned by the Stepan Company, found soil contamination (Morton 1982) which would be addressed by the removal action proposed in this EE/CA.

2.3 Environmental Setting

2.3.1 Institutional Environment

The Site is located in three communities: the Borough of Maywood, the Borough of Lodi, and the Township of Rochelle Park. The Boroughs of Maywood and Lodi are each governed by a mayor and council. The Township of Rochelle Park is managed by a township committee, which includes the Mayor as one of its members. None of the proposed NJDOT roadway improvements projects are planned to be performed in areas of the Site that are located within the Township of Rochelle Park.

2.3.2 Current Land Use

2.3.2.1 Borough of Maywood

The properties located in the Borough of Maywood are currently zoned for limited light industrial activities. Industrial land use comprises about 9 percent of the total land area of the Borough of Maywood, and is contained within four districts that are zoned for limited light industrial. This classification permits light manufacturing operations, as well as the related functions of processing, wholesaling, warehousing, and storage of goods.

2.3.2.2 Borough of Lodi

The properties located in the Borough of Lodi are currently zoned for commercial and industrial use. Commercial and industrial land uses comprise about 15 and 13 percent, respectively, of the total area of the Borough of Lodi. These properties are contained within defined commercial and industrial land use areas. However, many properties are located immediately adjacent to residential or recreational use areas, including some properties addressed by this EE/CA. The commercial use classification in Lodi permits smaller commercial buildings, convenience stations, planned shopping centers, auto-related establishments, retail stores, and restaurants. The industrial use classification permits food processing and manufacturing, automotive-related uses, communications, and a variety of light manufacturing, office, and warehouse use.

2.3.3 Future Land Use

Reasonably anticipated future use of the land at a CERCLA site is an important consideration in determining the appropriate extent of site cleanup. Future land use will affect the types and the frequency of exposures that may occur from any residual contamination remaining on the Site, which in turn affects the nature of the remedy chosen. Conversely, the alternatives selected through the CERCLA remedy selection process determine the extent to which hazardous constituents remain at the site, and therefore affect subsequent available land uses.

2.3.3.1 Reasonably Anticipated Future Land Use and Selection of Cleanup Criteria

Although the properties addressed in this EE/CA are not currently used for residential purposes but for commercial or industrial uses, the Site is located in a highly developed, urbanized part of NJ, with little available unoccupied or vacant land. Also, there are occupied residences near the properties addressed in this EE/CA (generally within a city block or two). These properties might become residential in the future unless effective institutional controls were to be developed and enforced.

Cleaning up properties currently zoned for commercial use to levels suitable for unrestricted use obviates the need for both institutional controls to prevent unprotected land uses and exposures and for post-closure maintenance. Obtaining institutional controls and providing post-closure maintenance can become costly and would not be cost-effective for properties containing relatively small volumes of contaminated soil.

For all of the above reasons, the removal action proposed in this EE/CA would clean up the affected properties to an average of 5 pCi/g above background of Ra-226 and Th-232 combined and an average above background of 50 pCi/g U-238. These cleanup levels are consistent with the unrestricted use cleanup levels specified by the Dispute Resolution Agreement between the EPA and DOE. Final determinations of the protectiveness of this response action will be assessed as part of the remedial action for soil to be selected in the ROD. Potential human exposure at these properties would be reduced because the contaminated materials would be removed from their present locations by specially trained workers and placed in an engineered facility designed for permanent disposal.

2.3.4 Topography, Drainage, and Surface Water

The Site is located in the glaciated section of the Piedmont Plateau of north central NJ. The terrain is generally level, with highs and lows created by occasional shallow ditches and low mounds.

Elevations range from 15 to 20 meters (m) (51 to 67 feet [ft]) above mean sea level. The surface slopes gently to the west and is poorly drained (Cole et al. 1981).

The Site lies primarily within the Saddle River drainage basin. Lodi Brook, a perennial stream on the Site, originates as two branches on the property at 149-151 Maywood Avenue. Because of urban development and construction, most of the original stream channel has been replaced by a storm-drain system beneath the surface. The original stream channel has been determined from old photographs and maps. The former channel pathways match the distribution of contaminated materials in the Borough of Lodi (DOE 1987). A warehouse and its parking lot currently cover the western branch of Lodi Brook. The eastern branch drains the surface area outside the warehouse property fence and then flows underground for most of its route to the Saddle River. Some surface runoff from the MISS moves parallel to NJ Rt. 17 and drains into Lodi Brook. Lodi Brook empties into the Saddle River. Additional information on topography, drainage, and surface water at the Site is presented in Sections 3.1 and 3.3 of the RI (DOE 1992).

2.3.5 Geology/Soils

Because the proposed removal action addresses only soil (at only some of the properties at the Site), and because USACE is conducting a separate RI on groundwater at the site, the hydrogeologic setting of the site is not discussed in this EE/CA. The hydrogeologic setting of the site is already described in some detail in the soil RI Report (Section 3.5 of DOE's RI Report, DOE 1992) prepared by DOE before USACE involvement in this site. The hydrogeologic setting will be further described in USACE's Groundwater RI Report.

2.3.6 Ecology

2.3.6.1 Terrestrial Ecosystems

The Site is located within the glaciated portion of the Appalachian Oak Forest Section of the Eastern Deciduous Forest Province (Bailey 1978). However, past agricultural and urban development has destroyed the forest habitat in the area.

Lack of suitable local habitat related to urban development limits animal life. Commonly occurring species are those adapted to suburban and urban environments. Bird species include house sparrow, red-winged blackbird, common crow, common grackle, starling, mourning dove, robin, and wood thrush. Mammalian species include Norway rat, house mouse, meadow vole, raccoon, eastern cottontail rabbit, opossum, and eastern gray squirrel. Woodchuck burrows have been observed at the MISS, which lies north of the properties addressed by this EE/CA. A small number of reptile and amphibian species (e.g., eastern garter snake and American toad) probably inhabit the area (Argonne National Laboratory, ANL 1984).

2.3.6.2 Aquatic Ecosystems

Aquatic habitats are limited to drainage-ways, Lodi Brook, and the Saddle River. Much of Lodi Brook has been incorporated into a storm drain system. The upper reaches of Lodi Brook, on the 145-151 Maywood Avenue property, are not enclosed in a culvert. Surface-feeding ducks (e.g., mallard and black duck) are commonly observed on the Saddle River and accessible portions of Lodi Brook. Mosquito larvae, beetles, bugs, snails, isopods, midges, aquatic worms, and other invertebrates typically occur in these habitats and in stream and temporary pond habitats (ANL 1987).

2.3.6.2 Threatened and Endangered Species and Wetlands

No threatened or endangered plant or animal species have been identified at the Site (Day 1992, Williams 1991, ANL 1984). Letters of consultation are contained in Appendix B. However, consultations will continue between USACE and the U.S. Fish and Wildlife Service (USFWS). Other than in the wetland area on the property at 149-151 Maywood Avenue, no natural habitat remains at the site. Hydrophytic vegetation is apparent along the upper portions of Lodi Brook on the property at 149-151 Maywood Avenue. A wetlands delineation has been performed as part of the RI that the Stepan Company conducted on the 149-151 Maywood Avenue property (CH2M Hill 1992). DOE performed a floodplains and wetlands assessment for the Site. Wetlands encompass approximately 1.7 hectares (4.3 acres) on the site; the majority of the wetlands is classified as palustrine emergent and palustrine forested. The USACE will use information in the wetlands report to plan activities and comply with wetlands review requirements specified in 33 CFR 320–330.

2.4 Analytical Data

Detailed descriptions of site characterization activities and results for the Site are presented in the RI report (DOE 1992) and supplemental information is presented in the Pre-Design Investigation Reports. Data collected recently by the USACE to fill data gaps can be found in the Pre-Design Investigation Cluster Reports: Cluster Numbers 1, 4, 5, and 6. USACE analyzed surface and subsurface soils in areas previously identified as containing FUSRAP waste. These reports document the presence of COCs within areas proposed for improvement by the NJDOT (USACE 2000a, b, c, and d).

Environmental Resolutions, Inc. (ERI) conducted a site investigation for the NJDOT in the area of the proposed NJ Rt. 17 and Essex Street Interchange Improvement project. The purpose of the investigations was to evaluate known and suspected areas of concern for potential contamination in areas of proposed rights-of-way, road construction, and utilities placement. ERI analyzed surface and subsurface soils and the groundwater in these areas to enable the completion of these investigations. Soil samples were analyzed for volatile organic compounds, semi-volatile organic compounds, metals, Th-232, Ra-226, and total U. Soil samples for radionuclide analysis were analyzed by gamma spectroscopy with additional analysis by alpha spectroscopy. Groundwater samples were analyzed for gross alpha, Th-232, Ra-226, and total uranium (ERI 2000).

Data collected by NJDOT and USACE was used to determine the extent of contamination that requires removal. The NJDOT data is consistent with USACE data and information. Only information pertinent to the properties affected by the NJDOT roadway improvements was considered in this EE/CA and is presented below.

2.4.1 Radioactive Contamination

The removal action objectives (RAOs), or soil removal cleanup levels, for this response action are an average of 5 pCi/g for Th-232 and Ra-226 combined and 50 pCi/g of U-238 (all above background) for each property addressed by this EE/CA.

Radioactive contamination on the properties affected by the NJDOT proposed roadway improvements is present in both surface and subsurface soils. Radionuclide concentration values for Ra-226, Th-232, and U-238 are summarized in Table 1.

2.4.2 Chemical Contamination

Chemical investigations at these properties on the Site focused on whether excavated soils would be classified as Resource Conservation and Recovery Act (RCRA)-regulated hazardous waste and whether chemical constituents associated with thorium processing operations were present. The investigations indicate that the soil is not a RCRA-regulated waste. In addition, no chemical constituents associated with thorium processing operations were present.

2.5 Site Conditions That Justify a Removal Action

The NCP provides eight criteria for evaluating the need for and selection of removal actions in Section 300.415(b)(2). If conditions at a CERCLA site satisfy the conditions of one or more of these criteria, then the NCP suggests that it is appropriate to consider conducting a removal action. Conditions at the Site on properties addressed in this EE/CA satisfy the following condition, justifying the performance of a non-time-critical removal action:

> Actual or potential exposure to nearby human populations, animals or the food chain from hazardous substances, or pollutants or contaminants [40 CFR 300.415(b)(2)(i)].

The NJDOT has specific plans for roadway improvements, which will involve excavation into, and additional activity on, certain properties at the Site containing radiologically contaminated soil. If NJDOT construction were to occur in advance of the cleanup of these properties, construction workers and other personnel might be exposed to the radioactive contamination in the soil.

If NJDOT roadway improvements were to occur on contaminated properties before cleanup, it is also possible that these activities may increase the potential for hazardous substances to migrate, including those listed in Table 1. Some migration might occur directly from the movement of contaminated soil by excavating, earth-moving and other heavy equipment. Additional migration of contamination might also occur once contaminated soil is uncovered or brought to the surface, either by the action of water falling onto or flowing across the site or by wind picking up contaminated soil and transporting it as wind-blown dust.

The early removal of the contaminated soils prior to or during NJDOT construction activities would help to prevent the inadvertent spread of contamination. Implementation of the removal action during NJDOT roadway improvement activities could also make currently inaccessible soils accessible so that removal actions can occur. The removal action would facilitate remediation of the overall Site by potentially reducing the ultimate volume of materials requiring excavation. Furthermore, removal and transport of these contaminated materials from their current locations to an authorized disposal facility would reduce the potential for increased exposures from these materials.

The results of sampling at these commercial properties indicate that the primary contaminants of concern are Th-232 and its decay products. The available data, as summarized in Table 1, indicate that the soil at these properties exceeds the soil cleanup levels proposed in this EE/CA for the proposed removal action.

3.0 Removal Action Objectives

The potential exists for disturbance and spread of soil contamination at the properties considered in this EE/CA. The intent of the proposed action is to remove the radiologically contaminated soils to an authorized disposal facility, where appropriate environmental precautions are employed. Specifically, implementation of the proposed action would allow USACE to remove, transport, and safely dispose of soil and debris that contain FUSRAP waste. This waste would be removed from those properties at the Site affected by NJDOT to minimize potential human exposure to the contamination and minimize the spreading of contamination and/or otherwise complicating ultimate cleanup measures. The specific objectives are defined in Sections 3.1 through 3.4.

3.1 Statutory Authority

Authority for responding to releases or threats of releases from a contaminated site is addressed in Section 104 of CERCLA. Under CERCLA Section 104(a)(1)(A), USACE is authorized to perform removal actions where there is a release or a threat of a release of a hazardous substance. In addition, Public Law 106-60, Section 611, also known as the Energy and Water Development Appropriations Act, authorizes the USACE to perform removal actions such as the one proposed in this EE/CA.

3.2 Scope and Purpose

The scope of the proposed removal action includes the removal, transportation, and permanent disposal of radiologically contaminated soils and debris from the Site on those properties affected by the proposed NJDOT roadway improvements as shown on Figure 1. The specific RAOs include:

1. Removal of FUSRAP waste from those properties at the Site affected by NJDOT improvements and as shown on Figure 1;

2. Clean up each area to unrestricted use criteria;

3. Transportation of excavated materials to an authorized disposal facility;

4. Minimization of potential exposure of personnel performing the removal action to soil contamination;

5. Restoration of the affected areas according to agreements established with each property owner; and

6. Certification that cleanup levels have been met for each area addressed in the removal action.

The RAOs or soil removal cleanup levels are an average of 5 pCi/g for Th-232 and Ra-226 combined above background and an average of 50 pCi/g U-238 above background. Although the properties addressed in this EE/CA are currently under a commercial land use, they are located in a

highly developed area with little vacant or unoccupied land, are located near occupied residences, and therefore might have residential uses in the future. Because of the small amounts of material involved, unrestricted cleanup of these properties is proposed to obviate the need for potentially more costly long-term engineering or institutional controls.

The primary purpose of the proposed action is to limit the potential for contaminant release into the environment from these properties and ensure the protection of human health and the environment. Removing contaminated soil from these properties before NJDOT roadway construction is also likely to minimize the migration of contamination which might otherwise increase the volume of contaminated soil to be addressed in the remedial action for this site. All activities would be conducted in a way to minimize the potential risks to onsite personnel performing the removal action, NJDOT personnel or contractors performing roadway improvement activities, or tenants employed at the commercial properties. The timely and complete removal of contaminated materials from these areas would contribute to the efficient performance of comprehensive remedial actions being planned for the overall Site.

3.3 Schedule

The proposed removal action for the contaminated materials on these properties is scheduled to begin in the fall of 2001. The goal is to perform the majority of the removal action within 1 year of starting.

The NJDOT plans to implement their work in stages. USACE would support each stage, as necessary, to allow the timely completion of NJDOT's plans.

The schedule includes development of detailed removal action design drawings, work plans, and health and safety plans; development of appropriate decontamination facilities; removal of contaminated materials from each affected property; transportation of the contaminated materials for offsite disposal; backfilling of excavated areas with clean soil; and restoration of disturbed areas.

USACE or NJDOT budgetary constraints, available waste transportation and disposal capacity, NJDOT design changes, or the discovery of previously unknown contamination could affect the schedule.

3.4 Compliance with Applicable or Relevant and Appropriate Requirements

The proposed removal action will comply with all applicable or relevant and appropriate requirements (ARARs). A compilation of ARARs for the proposed removal action is presented in Table 2. ARARs identified include:

- National Pollutant Discharge Elimination System (NPDES);
- NJ Pollutant Discharge Elimination System (NJPDES); and
- NJ Freshwater Wetland Mitigation Requirements.

4.0 Identification of Removal Action Alternatives

Information on the nature and extent of contamination at the Site on the properties addressed in this EE/CA was used to develop the following potential removal alternatives for evaluation in Section 5.

- Alternative 1: No Action. A decision on cleanup of the NJDOT affected areas would be delayed until the ROD for the Site is issued. This would result in either a delay in the NJDOT roadway and associated traffic safety improvements, or the NJDOT disturbance of contaminated soil which might exposure workers and allow contamination to migrate and thereby increase the volume of contaminated soil to be addressed in the soil remedial action for the site.

- Alternative 2: Removal and Offsite Disposal. Expedite removal of the radiologically contaminated soils and debris from the NJDOT affected areas, and transport the wastes to an authorized disposal facility. This alternative includes increased environmental and personnel monitoring during construction and restoration activities. Under Alternative 2, the removal action would remove contaminated soil from accessible areas to unrestricted use cleanup criteria.

- Alternative 3: Removal, Treatment, and Offsite Disposal. This alternative is similar to Alternative 2; however, soil would be treated through volume reduction prior to offsite disposal. A process that includes gravel separation of material greater than 0.95-centimeters (cm) (3/8-inch) diameter and radiological sorting of the soil finer than 0.95-cm (3/8-inch) nominal diameter would be employed to reduce the amount of soil requiring disposal at a facility that is authorized to accept radiological soils. Under Alternative 3, the removal action would remove contaminated soil from accessible areas to unrestricted use cleanup criteria.

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5.0 Evaluation of Alternatives

The proposed removal action is an early action with regard to the overall remedial action planned for the Site. The primary purpose of this removal action is to minimize the potential for human exposure to the radiologically contaminated soil at these properties, while limiting the potential for inadvertent spread of contamination. The removal alternatives were evaluated using EPA "Guidance on Conducting Non-Time-Critical Removal Actions under CERCLA (EPA 1993). This guidance and this EE/CA both use some of the NCP's criteria for evaluating remedial alternatives for a removal action in order to ensure that any removal action selected will be consistent with any remedial action that might later be selected for the site in a ROD.

This section evaluates the three removal alternatives identified in Section 4 based on their effectiveness, implementability, and cost in relation to site-specific conditions, consistent with the previously referenced EPA guidance on Non-Time-Critical Removal Actions (EPA 1993).

The removal alternatives are evaluated to ensure that they effectively protect human health and the environment and satisfy the RAOs defined for the media of concern. The effectiveness of each removal alternative to reduce the concentrations or exposure levels or to sufficiently recover media for subsequent treatment is evaluated. In addition, the protection each alternative affords to human health and the environment is considered. Also included in the evaluation is a technical assessment of the ability of the alternative to achieve the RAOs, as well as the useful life of the processes within a removal alternative (i.e., the length of time that it performs its intended function). The effectiveness and reliability of the removal alternatives are evaluated with respect to the COCs and conditions at the Site.

The implementability criteria encompasses both the technical and administrative feasibility and the availability of services and materials. Two aspects of technical feasibility are (1) availability and constructability of the processes within a removal alternative and (2) construction and implementation timeframe. Constructability addresses both onsite and offsite conditions. Implementation time and the period for beneficial results to be realized are critical factors in protecting public health and the environment.

The administrative aspects of implementability are also important. For each alternative, the ability to obtain necessary approval from government agencies; availability of approved treatment, storage, and disposal facilities and their capacities; and availability of necessary equipment and skilled workers to implement the alternative are considered.

Relative capital costs and operational and maintenance (O&M) costs are used rather than detailed estimates. During this phase, the cost analysis was based on engineering judgment, and each process was evaluated on its cost relative to the other two alternatives.

5.1 Effectiveness

The effectiveness of an alternative is defined by its ability to protect human health and the environment from risks associated with the contamination for both short and long terms. Measures of effectiveness include (1) reduction of potential risks to human health and the environment; (2) compliance with ARARs; (3) timeliness; and (4) reduction of contaminant toxicity, mobility, and volume through treatment.

5.1.1 Protection of Public Health and the Environment

This criterion addresses whether an alternative provides adequate protection of human health and the environment, and describes how risks are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

Under Alternative 1, no action would be taken until a final decision is made regarding remediation of the Site. This alternative involves no immediate change in current exposures to radioactive materials at the site; but human exposures could result if NJDOT work on the roadway improvement projects proceeded before contaminated soils in this area have been removed, and construction could spread the contamination and increase the volume of contaminated soil.

Under Alternative 2, radiologically contaminated soil and debris would be removed and transported offsite for disposal. This alternative is considered protective of human health and the environment. Potential human exposure at these properties would be reduced because the contaminated materials would be removed from their present locations by specially trained workers and placed in an engineered facility designed for permanent disposal. The potential for human exposure to contaminants would be reduced in both the short and the long terms under Alternative 2 because most of the contamination from these properties at the Site (addressed in the EE/CA) would be removed.

Removal Actions under Alternative 2 could temporarily increase generation of fugitive dust and internal combustion engine emissions. Keeping the soil damp easily controls fugitive dust emissions. Appropriate measures and engineering controls would be used to mitigate the slight potential for an increase in risk to the community. Excavated soils would be transported by dump trucks to the MISS for staging, using the same routes and methods which have been used in earlier removal actions on this site. The soil would then be transferred to railcars and transported to the disposal facility. Human exposure would be minimized during transport by inspecting the vehicles before and after use, decontaminating when needed, covering the transported waste, observing safety protocols, following predesignated routes, and limiting the distance the waste is transported in vehicles. Transportation risks increase with distance and volume, although the potential for any spillage and resultant human exposure is considered quite low. The transport of FUSRAP wastes to an offsite disposal facility would comply with U.S. Department of Transportation (USDOT) regulations. An emergency response program would be developed to respond to any accidents.

Potential occupational doses to workers involved in implementation of Alternative 2 would be due to direct exposure to gamma radiation from contaminated soil and from inhalation and ingestion of airborne particulates. Worker exposure would be reduced through implementation of a

comprehensive health and safety program including the proper use of safety protocols, personal protective clothing and equipment, restrictions on access to contaminated areas, and rotation of worker assignments. In addition, all machinery and equipment would be inspected after use, surveyed for radioactivity, and decontaminated if necessary. No occupational or safety barriers that would prevent the implementation of these remedies are foreseen. In addition, all workers would be provided adequate protection by implementing the state and federal health and safety requirements.

Under Alternative 3, short-term risk worker exposure would be quite similar to Alternative 2 except slightly higher than Alternative 2 due to increased material handling.

5.1.2 Potential Environmental Impacts

5.1.2.1 Geology and Soils

Under Alternative 1, since no action would be taken, this alternative would not directly cause impacts on soil or geology.

Under Alternatives 2 and 3, most of the soils at the Site have been modified by previous human activities, such as grading and addition of fill for construction of homes and businesses, construction of roadbeds and parking lots, and waste storage and disposal (on the former MCW property). The soil is classified as urban fill. Although the soil profile would be altered by the addition of clean fill soil, the impacts at the site are not considered significant since a natural profile no longer exists. On the Site, erosion of contaminated soil could occur during excavation. Backfilled areas would be susceptible to soil erosion until a new vegetative cover becomes established. Proper erosion control measures would limit the amount of material eroded during excavation. The top one-foot of clean soil cover would be of sufficient quality to allow prompt growth of a vegetative cover. Alternative 2 or 3 would not affect topography of the Site.

5.1.2.2 Water Quality

Under Alternative 1, since no action would be taken, this alternative would not directly cause impacts to water quality.

Under Alternatives 2 and 3, impacts on water resources due to potential soil erosion and transport into receiving waterways could occur at the Site during the implementation of this alternative. However, properly implemented erosion and runoff control measures would minimize impacts. Also, depending on the characteristics of the clean backfill soil and the amount of compaction during backfilling, the flow of water through soil pores could be impacted. Flow through the soil could be increased or decreased relative to its current flow rate. The layer of soil covering the Site would be graded so that surface runoff would be similar to that under existing conditions. Excavation of accessible contaminated soils would significantly reduce the potential for leaching of COCs into groundwater. This potential would not be eliminated, however, since inaccessible soils would remain in place.

5.1.2.3 Air Quality

Under Alternative 1, since no action would be taken, this alternative would not directly cause impacts to air quality.

Alternative 2 would result in releases of gaseous and particulate material to the atmosphere. These materials would be generated by the disturbance of soils from earth-moving activities and vehicular movement (fugitive [non-point source] emissions) and by internal combustion engines (controlled emissions).

Fugitive dust would constitute the highest potential for atmospheric-emissions load. Under this alternative, fugitive dust could arise from disturbance and entrainment of soil material due to excavation and backfilling in contaminated areas, wind-induced entrainment and erosion from exposed surfaces, and entrainment of particles due to vehicular activity on haul roads.

Wetting surface materials with water or dust control chemicals would mitigate fugitive dust impacts. Chemical wetting agents can increase the reduction significantly. In addition, storage piles and inactive areas can be covered to reduce wind erosion of soils.

Under Alternative 3, slightly more gaseous and particulate material than under Alternative 2 would be released to the atmosphere because of additional handling. Wetting of soils would reduce or eliminate any offsite impacts.

5.1.2.4 Ecological Resources

Under Alternative 1, since no action would be taken, this alternative would not directly cause adverse impacts on biotic resources. However, no action allows waste soils to remain. Continued exposure to COCs remaining in place may adversely affect urban biota on these properties and any fauna feeding upon them.

Biota. Under Alternatives 2 and 3, terrestrial biota would be affected by disruption of existing habitat during implementation of the removal action. Mortality of some small mammals and soil invertebrates may result. These impacts would be temporary because the existing habitat would be reestablished and other biota similar to those originally present would be expected to rapidly recolonize after application of the final soil cover.

Offsite aquatic habitat in the downstream areas of Lodi Brook could be affected by increased sediment loading of contributing surface runoff. Erosion control measures would minimize these impacts. Except for a small wetland area, none of the terrestrial or aquatic habitats in the area of the proposed removal action are considered sensitive or vulnerable, as this is a heavily urbanized area. (NJ's Freshwater Wetlands Mitigation Requirements, an ARAR, would be complied with for the removal's impact upon this wetland.)

Threatened and Endangered Species. Consultation with USFWS and the NJDEP indicates that no protected species are known to be present on the Site (Day 1992; Williams 1991). However, USACE would continue to coordinate actions on this site with USFWS. Two walk over surveys of the Site indicated that no protected species are present (ANL 1984; DOE 1993). The properties that would be affected by the NJDOT activities are fully developed. During a wetlands delineation performed by Stepan Company at the Maywood Chemical Company Site, no threatened or endangered species were identified (CH2M Hill 1992). Therefore, there would not be any adverse impacts from Alternatives 1, 2, or 3.

Floodplains/Wetlands. Under Alternatives 2 and 3, there would not be any adverse impacts to the floodplain. Areas disturbed by the removal action would be restored in kind. Wetlands would be affected by the removal action. Areas that would be affected are located in open channels that constitute Lodi Brook. The excavation of soil in the wetland would be expected to result in the loss of the characteristics and functions of the wetland at least during the implementation phase of the removal action. The wetland would be restored after the removal action is completed. The exception is the area of Lodi Brook where the NJDOT plans to extend the existing culvert. Applicable technical requirements of state freshwater wetland regulations, an ARAR, would be followed.

5.1.3 Compliance with ARARs

Since the only ARARs identified for this response action are action-specific, under Alternative 1 no ARAR would go unmet because there would be no response action.

Federal and state environmental laws were evaluated with regard to their applicability or relevance and appropriateness to the COCs and circumstances at the Site under Alternatives 2 and 3. A list of ARARs is presented in Table 2 and those requirements considered applicable or relevant and appropriate to this removal action alternative are summarized below.

Action- and chemical-specific ARARs would be achieved by Alternatives 2 and 3, excavation and commercial disposal.

5.1.4 Timeliness

Under Alternative 1, no action would be taken to remediate these properties before the comprehensive remediation of the overall Site.

Alternatives 2 and 3 would result in an expedited remediation of these areas at the Site. The only practical constraint on the speed with which Alternatives 2 and 3 could be implemented is the accessibility by NJDOT of areas that are currently inaccessible. In addition, the procurement and assembly of equipment necessary for the treatment would cause Alternative 3 to take more time to implement than Alternative 2.

5.1.5 Reduction of Contaminant Toxicity, Mobility and Volume by Treatment

Under Alternatives 1 and 2, there would be no reduction of contaminant toxicity, mobility, or volume through treatment.

Under Alternative 3, processes were evaluated that might reduce the amount of material requiring disposal at an authorized facility that accepts radiological material through soil sorting, which would be considered treatment to reduce the volume of contaminated material to be addressed. Such a process would not reduce the mobility or toxicity of COCs. It should be noted that there is no physical treatment method that eliminates the radiotoxicity of the radionuclide COCs.

5.2 Implementability

Under Alternative 1, implementability is not a concern since no action would be taken.

Alternative 2 is an implementable option. Excavation, construction, decontamination, demolition, and transportation equipment are commercially available, but require trained personnel for operation. Borrow sites for backfill and soil cover material have not yet been identified, but would be procured as a commodity at the time the removal action is implemented, using locally obtained fill material when possible.

The acceptability of Alternative 2 would also be affected by the administrative requirements for transport and disposal. The USDOT regulates the transport of most radioactive and chemically hazardous material, and some states also have their own special requirements. The material being transported may not be subject to USDOT requirements depending on the actual levels of radioactivity.

Alternative 3 is similar to Alternative 2. Although some aspects of the treatment portion of Alternative 3 are considered to be implementable if certain treatment performance criteria are met (i.e., if treatment were effective in separating soil contamination above the cleanup levels from soil below the cleanup levels). The lack of available space to store treated soil near these properties limits the implementability of Alternative 3. Gravel separation and radiological sorting, which would have been elements of Alternative 3, are technologies that are currently available commercially, although some refining for site-specific conditions will be required to optimize volume reduction. In addition, the procurement cycle for the specialty equipment is lengthy and the equipment would take some time to assemble before operation. As a result, it is unlikely that an effective treatment process could be procured and assembled quickly enough to address the contaminated soil present in these areas addressed in this EE/CA before the NJDOT roadway improvements impact these properties. Treated soil below the cleanup levels would not be used as backfill, but would be disposed of in an appropriate disposal facility. The waste acceptance and capacity restrictions imposed by an offsite disposal facility would not be expected to impact implementability.

5.2.1 Technical Feasibility

Technical feasibility does not apply to Alternative 1, the no action alternative.

Excavation of radiologically impacted soils under Alternative 2 is technically feasible using readily available equipment. To protect existing structures, standard construction practices such as sloping excavations away from exterior walls would be used where necessary. The performance of excavation and construction techniques has been demonstrated during past removal and time-critical removal actions on the Site.

Commercial disposal of the excavated materials is technically feasible and would reduce potential contaminant mobility. Commercial disposal of the types of wastes that would be encountered is currently available. All appropriate commercial waste disposal facilities are required to maintain environmental monitoring and occupational health programs.

Alternative 3 is similar to Alternative 2. The treatment portion of Alternative 3 is considered to be technically feasible if certain treatment performance criteria are met. Gravel separation and radiological sorting technologies are currently available commercially. Some refining for site-specific conditions will be required to optimize volume reduction.

5.2.2 Availability of Services and Materials

Availability does not apply to Alternative 1.

The services and materials to perform Alternative 2 are readily available. The treatment processes in Alternative 3 would require additional time, compared to Alternative 2, to procure and assemble. The radiological sorting equipment could not be procured and assembled by the time of the anticipated start date of the Removal Action.

5.2.3 Administrative Feasibility

Administrative feasibility considerations include the potential of a proposed action to achieve response objectives and effectiveness. These concerns include permitting (for activities that are not onsite and that do not qualify for the CERCLA exemption for permits for onsite activity) and interagency cooperation, public and occupational safety, transportation factors, impacts on land use and values, compliance with policies and requirements, and public acceptance. USACE has prepared a site-specific community relations plan for the Site that would be implemented for the removal action (USACE 2001).

The removal action would be sequenced to minimize disturbance to affected property owners and precede each stage of NJDOT's roadway improvement plans.

Measures would be taken to minimize short-term negative impacts on the community during the implementation of Alternatives 2 and 3. Such negative impacts would be similar to those for the earlier removal actions conducted on the Site, and would include temporary staging of excavated soils at the MISS, as well as mitigation of traffic and noise associated with the removal and transportation of the contaminated materials. Under Alternative 3, soils would have a longer residence time at the MISS due to soil processing. In areas that are currently inaccessible to USACE, short-term traffic and noise impacts would coincide with NJDOT plans to make these areas accessible. Noise and traffic impacts would be mitigated by conducting all activities according to pertinent regulatory requirements and good engineering practices, using designated transportation routes and appropriate traffic control measures, and an active community relations program.

No administrative feasibility difficulties are anticipated with respect to commercial disposal of the wastes. The waste volume associated with this proposed removal action would be a small fraction of the total waste capacity of the commercial disposal facility.

All response activities at the Site are coordinated with EPA Region 2 and state and local government authorities. Active communications would be maintained with the public, local media, EPA, and state and local officials, as specified in USACE's community relations plan for the site.

5.3 Cost

The costs of each alternative are considered only in a comparative manner to determine if the cost of one alternative is much greater than that of another alternative of similar effectiveness (see Table 3). Cost estimates are based on information from NJDOT for current plans for roadway improvements. These costs reflect what is currently proposed for a USACE removal, but are

intended solely for the purpose of evaluating the alternatives in this EE/CA. General estimates of potential costs for each alternative can be compared to permit a screening according to relative costs. The cost estimate for the removal action alternatives is included in Appendix A.

For Alternative 1, there would be no capital cost. The total cost to complete this alternative in 2001 dollars ($) is therefore $0. The estimate includes all direct and indirect costs, including subcontracts, engineering, environmental health and safety support, procurement, overhead, and contingencies. This alternative would only defer the costs associated with remediation of these properties until the ultimate remediation of the overall Site.

The total cost to complete Alternative 2 in 2001 dollars is approximately $21.9 million. Costs are based on excavation and disposal of accessible soil and inaccessible soil that will be made accessible by NJDOT. The estimate includes all direct and indirect costs, including subcontracts, engineering, environmental health and safety support, procurement, overhead, and contingencies.

The total cost to complete Alternative 3 in 2001 dollars is approximately $25.0 million. Costs to implement also assume that all areas shown on Figure 1 would be addressed in the proposed removal action. Any decrease in the assumed effectiveness of treatment would raise the cost of Alternative 3.

5.4 Comparative Summary

Alternatives 2 and 3, for managing contaminated materials at these properties, were compared on the basis of effectiveness, implementability, and cost. This comparison is summarized in Table 4. There is significant uncertainty in the cost to complete Alternative 3. In addition, the procurement cycle for the specialty equipment associated with this alternative, and its assembly, is lengthy. It is unlikely that effective treatment could be completed on the areas addressed in this EE/CA before NJDOT roadway improvements impact the properties. The equipment may not be available at the start of the removal action. In order to meet the NJDOT timeline, storage of material on the MISS might be required until the equipment becomes available.

5.5 Identification of the Proposed Alternative

Based on an evaluation of the alternatives for the proposed removal action, USACE proposes to select Alternative 2 as the most effective, implementable, ARAR-compliant and cost conscious alternative. Under Alternative 2, the radiologically contaminated soil and debris at the NJDOT affected areas would be excavated, and temporarily staged at the MISS pending transport to an authorized disposal facility. This alternative would present no unacceptable risk to public health and the environment, and can be implemented in a timely, straightforward, and effective manner. Regulatory and community acceptance with respect to the alternatives identified in this EE/CA will be evaluated by USACE after close of the public comment period, and after all of the comments received during the public comment period have been evaluated.

6.0 Proposed Action

The proposed removal action is consistent with CERCLA, which requires that interim actions, such as removal actions, contribute to the extent practicable to the efficient performance of any anticipated final remedy. The analysis presented in this EE/CA demonstrates that the proposed action can be implemented in a manner that protects human health and the environment. The proposed removal action is consistent with the overall cleanup strategy for the Site, and will not limit the choice of reasonable alternatives or prejudice the ultimate decision for which the FS is being prepared.

Under the proposed removal action, radiologically contaminated soil and debris at Site areas affected by NJDOT roadway improvement plans that exceed the cleanup criteria (average above background concentrations of 5 pCi/g Ra-226 and Th-232 combined and 50 pCi/g U-238) would be removed and transported to an authorized disposal facility. The approximate boundaries of excavation on each area would be established based on existing radiological data and USACE's understanding of current NJDOT roadway improvement plans in the area. This data would be supplemented by additional radiological survey activities conducted during implementation of the removal action. The environment at each affected area would be monitored throughout the removal action to ensure that all pertinent environmental, health, and safety requirements are met. Table 5 provides appropriate measures that would be employed to reduce potential adverse impacts on the environment and minimize potential human exposure.

Conventional excavation equipment would be used to remove the radiologically contaminated soil and debris from each affected area. Excavation would be performed with hand tools or mechanical equipment appropriate to the quantity of soils to be removed, the depth at which the materials are found, and proximity to buried utilities. As the excavation proceeds, field personnel would monitor the levels of radioactivity in the excavation area to confirm that the cleanup criteria are met.

Upon determination that radiologically contaminated soil exceeding the cleanup criteria has been removed, an FSS would be performed consistent with the principles established by MARSSIM. To ensure compliance with the cleanup criteria, soil samples would be collected from the excavated and nonexcavated areas for laboratory analysis. To ensure that the fill material does not pose a health threat, only clean fill would be used as backfill. Whenever possible, local sources of clean backfill would be used. NJDOT specifications on fill placement would be considered in areas subject to NJDOT roadway improvements. The affected areas would be restored according to the agreement established with each property owner (e.g., establishment of grass, repair of asphalt or concrete surfaces, etc.). Depending on the stage of the NJDOT roadway improvements, restoration may be implemented by USACE or NJDOT. This would be determined prior to the implementation of the removal action.

Wastes would be packaged and shipped according to the waste acceptance criteria of the authorized disposal facility, as well as applicable requirements of USDOT and NJDOT. Excavated materials that are contaminated and require disposal would be placed in trucks for transport to the MISS. The same transportation routes used in earlier removal actions for this site

would be used in this proposed removal action. Soils would be temporarily staged at the MISS pending waste designation and manifesting to ensure that the waste meets the acceptance criteria of the receiving facility (e.g., no free water). At the MISS, radiologically contaminated soil would be loaded into rail cars for transport to the disposal facility by rail in bulk form. Appropriate measures would be taken at the MISS to prevent the spread of contamination.

The exterior of all vehicles would be surveyed for radiologically contaminated soils, and any vehicles exceeding applicable contamination guidelines would be decontaminated before going onto public roads or leaving controlled areas. The same transportation routes used for earlier removal actions on this site would be used for this removal action. An emergency response plan would be developed and coordinated with appropriate local fire and police departments. During all truck travel on public roads, truck beds would be covered to contain radiologically impacted soils and debris and to avoid dust generation and release. Any soil containing an average 2,000 or more pCi/g would be packaged and transported in compliance with USDOT requirements for radioactive materials.

The removal action would be conducted in a staged approach to clean up areas that would be impacted per NJDOT's staged work. This approach would be designed to minimize disturbance to property owners and NJDOT planned roadway improvements and maximize the efficiency and safety of construction activities (both USACE and NJDOT). The implementation of this removal action would also minimize the potential that NJDOT activity would spread the contamination or allow contamination to migrate, which would increase the volume of contaminated soil to be addressed by USACE at this site, and thereby increase total site cleanup costs. To the extent practicable, excavation and construction activities would be carried out to minimize the disturbance of important site features (e.g., mature trees, building and structures) and to accommodate specific concerns of the property owners or tenants. Temporary relocation of tenant ingress/egress or parking would be provided, where applicable, during the excavation and construction period.

The current plan to manage water, collected while excavating soil, would involve on-site treatment to remove suspended particles (soil), transport to the MISS for staging, and sampling of water for analysis per the New Jersey Drinking Water Standards (which are assumed to be the lowest discharge limits which might be established). If future testing indicated that the water could not be discharged to the ground surface but meets the Publicly Owned Treatment Works waste acceptance criteria, the water would be transported to a Publicly Owned Treatment Works for treatment and disposal. If the water exceeds the waste acceptance criteria, the collected water would be transported to an appropriate off-site treatment facility for further treatment and disposal.

In summary, the proposed removal action is expected to include the following activities:

1. Preparation of removal action design drawings and specifications.
2. Preparation of detailed construction detailed work plans.
3. Excavation at the NJDOT affected areas of radiologically contaminated accessible soil and debris that exceed the cleanup criteria.
4. When appropriate, testing or scanning soil to determine if it exceeds the cleanup levels and needs to be removed from the site for offsite disposal.

5. Loading of radiologically contaminated soil and debris into trucks for local transport.
6. Transportation of radiologically contaminated soil and debris to the MISS for staging.
7. Laboratory analysis of radiologically contaminated soil and debris to confirm compliance with regulatory requirements and waste acceptance criteria of the disposal facility.
8. Temporary staging of radiologically contaminated soil and debris at the MISS.
9. Loading of radiologically contaminated soil and debris into railcars at the MISS rail spur.
10. Rail transport to an authorized disposal facility.
11. On-site treatment of water to remove suspended particles (soil).
12. Transport of collected water for additional treatment, if required, or disposal.
13. Final status survey of excavated and nonexcavated areas to verify that the cleanup criteria has been met.
14. Restoration of areas impacted by the removal action in accordance with the agreements established with each property owner.
15. Environmental monitoring to ensure compliance with all pertinent environmental, health, and safety requirements and to verify that no uncontrolled releases to the environment are occurring.

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7.0 Public Participation

The public, EPA, NJDEP, NJDOT, and local government officials are invited to review and provide comments on this document. Written comments on the EE/CA, on any of the three removal alternatives evaluated in the EE/CA, including the USACE-preferred alternative, may be submitted during a 30-day public comment period that begins July 25, 2001, and ends August 24, 2001. The comment period can be extended by at least 15 days upon timely request to the USACE. Notice of the public availability of the EE/CA and the public comment period was published in *The Record* and *The Shopper News* on July 25, 2001, and will be published in *Our Town* on August 2, 2001.

An information repository for the Site and an administrative record for this proposed response (i.e. removal) action have been established at the following location:

FUSRAP Public Information Center
75A West Pleasant Avenue
Maywood, New Jersey 07607

For hours of operation, call the FUSRAP Public Information Center at 1-201-843-7466. Copies of the EE/CA document are available at the above location or will be provided by mail upon request by calling the FUSRAP Public Information Center. The EE/CA is also available for review at the Maywood Public Library, 459 Maywood Avenue, Maywood, during regular library hours.

USACE will evaluate comments received on the alternatives evaluated in this EE/CA during the public comment period and will respond to such comments in a Responsiveness Summary, which will be attached to the Action Memorandum. That Action Memorandum selects the removal action to be implemented. USACE is especially interested in input regarding the preferred alternative and any considerations for carrying out the proposed action. Written comments on the alternatives evaluated in this EE/CA, including the alternative recommended by USACE, should be addressed to:

Allen Roos, Project Manager
Department of the Army
U.S. Army Corps of Engineers, New York District
26 Federal Plaza, Room 2108
New York, NY 10278-0090

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TABLES

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Table 1. Radionuclide Concentrations in Site Soils[1]

Property	Radium 226		Thorium 232		Uranium 238	
	Min. (pCi/g)	Max. (pCi/g)	Min. (pCi/g)	Max. (pCi/g)	Min. (pCi/g)	Max. (pCi/g)
Borough of Maywood						
137 NJ Rt. 17	0.40	116.08	0.49	624.70	0.00 U	101.1 U
167 NJ Rt. 17	0.50	13.79	0.32	93.97	1.24 J	45.5 U
200 NJ Rt. 17	0.3	35	0.3	390	-3.94[2] U	22.6 U
239 NJ Rt. 17	0.38	7.26	0.96	102.66	4.87 U	51 U
85,87,99-101 NJ Rt. 17	0.38	34.73	0.32	188.28	1.96 J	77.4 U
99 Essex St.	0.3	6	0.4	61	-0.51[2] U	17.4 U
113 Essex St.	0.24	10	0.2	18	0.9	15.3 U
Borough of Lodi						
I-80 westbound ROW	0.3	7.3	0.4	21	0.74 U	15.5 U
I-80 eastbound ROW	Area was considered inaccessible for data collection purposes					
160 & 174 Essex St.	0.33	7.58	0.31	61.09	-5.93[2] U	25.2 U
72 Sydney St.	0.26	4.3	0.22 U	16	-3.27[2] U	8.70 U

[1] Data reported in this table includes background. The following levels of soil contamination have been reported (Remedial Investigation, DOE 1992) as representative of background in soil in this area. All results were reported at the minimum detectable activity.

Location	U-238	Ra-226	Th-232
Foschini Park	<3.5 U	<0.8 U	<1.1 U
Rochelle Park	<2.4 U	<0.5 U	<0.9 U
Borough Park-Maywood	<2.9 U	<0.7 U	<0.9 U
Average	<2.9	<0.7	<1.0

[2]Since background reflect a range of values, a negative value represents a concentration which is below background.

ROW – Right of Way
U – Undetected, actual concentration less than or equal to the minimum detectable activity.
J – Estimated

Table 2. ARARs for the Removal Action

Potential Requirement	Citation	Description of Requirement	ARAR Status	Comment
National Pollutant Discharge Elimination System (NPDES) and New Jersey Pollutant Discharge Elimination System (NJPDES)	40 CFR 122 Subpart B and N.J.A.C. 7:17A-1 et seq.	Applies to the discharge of pollutants from any point source into waters of the United States (or State for NJPDES). The Act defines a point source as any discernible conveyance from which pollutants are or may be discharged. Stormwater discharges associated with construction and other industrial activity require NPDES permit.	Applicable	Removal actions that would discharge a pollutant into surface waters would enter into the NPDES regulatory framework. A permit is not required for onsite CERCLA response actions, but the substantive requirements would apply.
New Jersey Freshwater Wetlands Mitigation Requirements	N.J.A.C. 7:7A-14.1	When freshwater wetlands are disturbed in the State of NJ, requires restoration of, creation of replacement wetlands, or enhancement of remaining wetlands on either a ratio of wetland area disturbed to the area of restored/enhanced/created wetland or based on the replacement of the ecological value of the disturbed wetland.	Applicable	Wetland areas classified as ordinary and/or of intermediate value (by State of New Jersey definitions) exist on more than half of the 24 properties addressed in this FS. Mitigation requirements would be incorporated into the Remedial Design.

Table 3. Comparative Cost Analysis of the Removal Action Alternatives
(Cost in Thousands, $FY01)

WBS No.	Activity	Alternative 1: No Action[1]	Alternative 2: Excavation & Offsite Disposal[1]	Alternative 3: Excavation, Treatment, & Offsite Disposal[1]
1	**EE/CA**	**0**	**21,872**	**24,984**
1.1	**Task Management**	0	1,172	1,385
1.2	**Engineering Support**	0	782	923
1.3	**Removal Action**	0	9,918	13,917
1.3.1	Mobilization	0	67	67
1.3.2	Remediation	0	1,004	1,004
1.3.3	Local Transportation to the MISS	0	5,622	5,622
1.3.4	Specialty Remediation	0	122	122
1.3.5	Restoration	0	2,769	2,769
1.3.6	Demobilization	0	334	334
1.3.7	Treatment	0	0	3,999
1.4	**Transportation and Disposal**	0	10,000	8,759
1.4.1	T&D of Radiological Waste	0	9,608	8,367
1.4.2	T&D of Commingled Waste	0	0	0
1.4.3	T&D of Hazardous Waste	0	0	0
1.4.4	T&D of Non-Hazardous Waste	0	0	0
1.4.5	T&D of Water (POTW)	0	392	392

[1]Includes escalation, contingency, and fee.

WBS = Work Breakdown Structure
T&D = Transportation and disposal
POTW = Publicly owned treatment works

Table 4. Comparative Analysis of the Removal Action Alternatives

Criteria	Alternative 1: No Action	Alternative 2: Excavation & Offsite Disposal	Alternative 3: Excavation, Treatment, & Offsite Disposal
Overall Protectiveness of Human Health and the Environment	Low	Medium/High	Medium/High
Compliance with ARARs	Not applicable	High[1]	High[1]
Long-term Effectiveness and Permanence	Low	High[1]	High[1]
Short-term Effectiveness, Including Potential for Environmental Impacts	Low	High[1]	Medium
Time to Implement[2]	Not applicable	High[2]	Medium[3]
Reduction in Toxicity, Mobility, or Volume Through Treatment	Low	Low	Medium
Implementability	Not applicable	High[1]	Medium
Cost in FY 01 dollars	0	$21.9 Million	$25.0 Million

[1] Most favorable ranking.
[2] Time to implement is dependent on USACE funding, which is appropriated annually from Congress.
[3] Specialty equipment required for the soil sorting operation would have a long procurement cycle.

Table 5. Major Mitigative Measures for the Proposed Action

Mitigative Measure	Features
Dust Control	Dust suppressants (e.g., water sprays, foam application) will be used during activities having the potential for generating significant quantities of airborne particulates.
Worker Protection	The Site Safety and Health Plan covers the planned excavation, transportation, and other activities that will be performed under the removal action. In addition, an Excavation Work Permit and a Hazardous Work Permit will be prepared and issued by the site's safety and health staff. The permits will identify any specific requirements not covered by the Site Safety and Health Plan.
Environmental Monitoring	The Site Safety and Health Plan specifies environmental monitoring that must be performed during the planned excavation, transportation, and other activities. Air monitoring will include both personal (exposure rate) and ambient air monitoring. Real-time (direct reading) instruments will measure the following: oxygen, flammable/combustible vapors, organic vapors, dust, gross alpha. Work practices will be modified or curtailed based on the reading.
Equipment Inspection	Equipment used for excavation, processing, and transportation of contaminated materials will be routinely inspected during operations. Equipment will be decontaminated, as necessary, to prevent inadvertent spreading of radiologically impacted soil or debris into uncontrolled areas.
Run-on/run-off Controls	Temporary berms or other diversion structures will control surface water run-on. Mitigation of contaminants through run-off will be by sediment filters, siltation fences, or treatment.
Access Restrictions	Access to work areas will be restricted, and current access controls at the MISS will be maintained. All workers will pass an access control point for radiation monitoring to prevent radiologically impacted soil, debris, or personal protective equipment from leaving the site.
Traffic Control	Transportation routes will be established for trucks transporting radiologically impacted soil and debris from the NJDOT affected properties to the MISS. The USACE will integrate its operations with NJDOT work and/or flagman to assure trucks enter and leave the site safely.

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FIGURES

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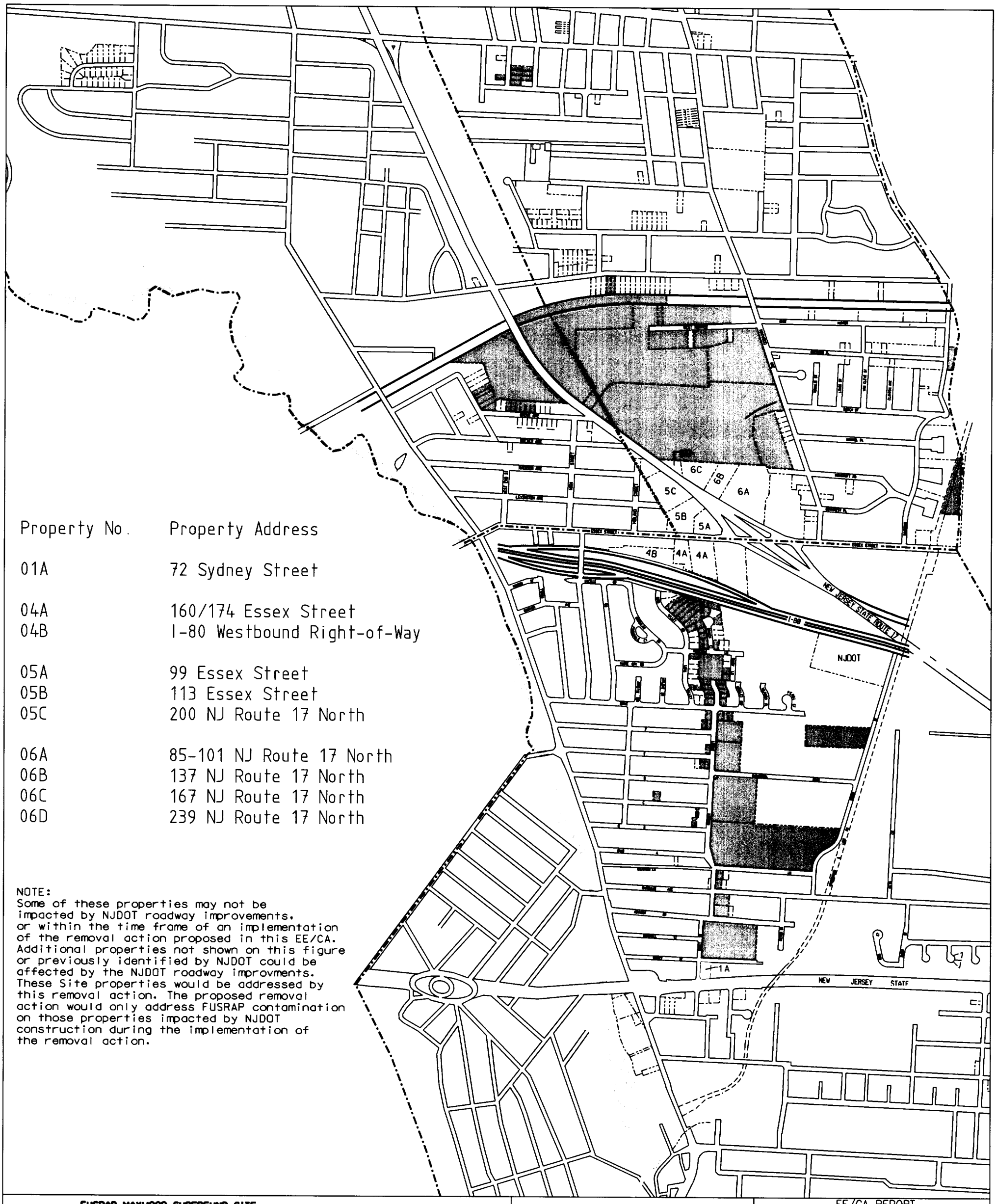

Property No.	Property Address
01A	72 Sydney Street
04A	160/174 Essex Street
04B	I-80 Westbound Right-of-Way
05A	99 Essex Street
05B	113 Essex Street
05C	200 NJ Route 17 North
06A	85-101 NJ Route 17 North
06B	137 NJ Route 17 North
06C	167 NJ Route 17 North
06D	239 NJ Route 17 North

NOTE:
Some of these properties may not be impacted by NJDOT roadway improvements. or within the time frame of an implementation of the removal action proposed in this EE/CA. Additional properties not shown on this figure or previously identified by NJDOT could be affected by the NJDOT roadway improvments. These Site properties would be addressed by this removal action. The proposed removal action would only address FUSRAP contamination on those properties impacted by NJDOT construction during the implementation of the removal action.

FUSRAP MAYWOOD SUPERFUND SITE PROPERTIES NOT AFFECTED BY NJDOT ROADWAY IMPROVMENTS

FUSRAP MAYWOOD SUPERFUND SITE PROPERTIES POTENTIALLY AFFECTED BY NJDOT ROADWAY IMPROVMENTS

0 1200 2400

File Name: bosfs01\MAYWOOD\TASK0258\FIGURE1.DGN - 06_13_01

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
NEW YORK DISTRICT

FIGURE 1
Properties at the Site & Properties addressed in this EE/CA

EE/CA REPORT
FUSRAP MAYWOOD SUPERFUND SITE
MAYWOOD, LODI, AND
ROCHELLE PARK, NEW JERSEY

US ARMY CORPS OF ENGINEERS
FUSRAP
FORMERLY UTILIZED SITES
REMEDIAL ACTION PROGRAM

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Appendix A

Cost Estimate For Removal Action Alternatives

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A.1 Introduction

This appendix provides information regarding the cost estimate for the detailed analysis of the three alternatives for the EE/CA. The costs used in this analysis are based on Environmental and Construction Means Cost Data, vendor quotes, and engineering estimates. Productivity adjustments are incorporated to compensate for lost productivity due to construction delays and safety requirements imposed due to contaminated soil. These cost estimates are expected to provide an accuracy of -30 to +50 percent and are prepared using available data from the Remedial Investigation Report for the Maywood Site and the Pre-Design Investigation Report: Cluster Numbers 1, 4, 5, 6, and 9.

Section A.2 provides general cost information including the scope of the estimates, the WBS, project schedules, estimating methodology, key parameters, and general groundrules and assumptions. Section A.3 provides the scope of work, detailed assumptions, and basis of estimate for each alternative.

Each cost estimate assumes that each property would be cleaned up in its entirety.

A.2 General Cost Information

A.2.1 Cost Estimating Scope

Scope is defined for each alternative by the WBS elements for which costs have been estimated. Costs are estimated for all WBS elements listed in Section A.3. Costs are estimated over a 1-year span for each alternative.

A.2.2 Work Breakdown Structure

The WBS subdivides the project into logical elements for cost estimating purposes and incorporates the project into the overall FUSRAP so that related program costs are recognized.

For simplicity, the cost estimate consists of three hierarchical levels and uses a 1-digit number at each level. Detail items are at the third level, Level 2.

Level 0 – WBS Level 0 (Project) e.g., EE/CA – NJDOT Roadway Improvements
Level 1 – WBS Level 1 (Account) e.g., Removal Action
Level 2 WBS Level 2 (System) e.g., Mobilization

A.2.3 Schedule

The removal action can not be completed until the NJDOT makes areas of the Maywood Site that are currently considered inaccessible, accessible to the USACE. The majority of the project soils are accessible and will be removed within 1 year. However, the NJDOT roadway improvement projects will be completed over several years. Schedules for major construction activities are assumed to be constant and do not change between alternatives. This assumption facilitates cost comparisons between alternatives. Specific schedules are calculated or based on engineering judgment.

A.2.4 Estimating Methodology

The primary methodology used is of a quantity take-off nature, whereby costs are calculated based on unit cost multiplied by quantity or other input parameters. Unit cost data used in the relationship are primarily drawn from the Means Cost Data. Unit cost for disposal was derived from existing USACE national contracts.

Several WBS elements incorporate a productivity adjustment process as part of the estimating methodology. This process is accomplished through the use of factors that are applied to equipment performance measures in order to account for degradation in the productivity, performance, or output levels of the equipment resulting from site-specific conditions. Productivity factors exist for three conditions: site, soil, and safety. Site adjustments are made to account for temporary work interruptions and delays resulting from poor weather, unsafe work

conditions, and other similar unforeseeable events. Soil adjustments are made to account for varying levels of difficulty associated with excavating different types of soil or rubble. A safety adjustment is made to adjust productivity levels due to safety procedures associated with the radioactive nature of impacted materials.

In general, estimating methodology is not site- or alternative-specific. Once a methodology has been established for a given WBS element, it becomes the common methodology that is employed for that given WBS element across the various alternatives.

A.2.5 Key Parameters, Ground Rules, and Assumptions

Key parameters are quantities, unit costs and assumptions that tend to drive the ultimate cost for a project. Key parameters for the Maywood Site are shown in Table A-1. These parameters were used to generate the estimate.

Ground rules and assumptions are statements of guidance and/or logic that are established in order to bound or limit the cost estimate. They serve to define the estimate by clarifying the effort that the estimate addresses and how cost for that effort is derived. Ground rules and assumptions are included in the detailed estimates contained in the calculation package. A summary of those ground rules and assumptions is presented below:

- RS Means Environmental Remediation Cost Data-Unit Price, 1999, 5th Edition, was used as the basis for the utilization of most unit prices.

- Engineering News Record Construction Costs and Building Cost historical and current (actual) indexes were used for Unit Price Adjustment from 1998 to 1999 and 1999 to 2000 and then to February 2001 (these include labor, equipment and materials).

- Contingency has been applied at ranges from 0 to 100 percent based upon the knowledge of the site conditions, possible changes anticipated, quantity refinements needed, experience, and best judgement.

- A total of 6 percent of the total base Removal Action (WBS 1.3) and transportation and disposal (T & D) (WBS 1.4) costs was used to estimate the individual Task Management functions (WBS 1.1). This includes bare professional services labor for management, procurement, contract management, safety, Accounts Payable and Receivable, and general and administrative support with overhead. It also includes indirect costs such as trailers, phones and other utilities, supplies, equipment, and support vehicles.

- A total of 4 percent of the total base Removal Action (WBS 1.3) and T & D (WBS 1.4) costs were used to estimate the individual Engineering Support (WBS 1.2) components for each sub-cluster and/or area. This includes bare professional services labor for intermediate and final designs, procurements support, on-site field

engineering, construction quality assurance, permitting, document control and subcontractor oversight.

- It has been assumed in Mobilization (WBS 1.3.1) that only two primary mobilizations will occur due to the sub-cluster and area proximity and ease of access between them allowing mobility from one cluster to the other.

- In-place (bank) cubic yards were multiplied by a factor of 1.25 to derive tons for disposal.

- A factor of 1.20 was used to calculate loose cubic yard volumes from multiplying the Bank yards excavated to estimate soils load-out costs (from the off-sites to the MISS).

- A contingency of 100 percent was placed on all dewatering and water handling, transportation and disposal operations due to uncertainty in the volume that may be encountered.

- Work hours were assumed to be 10 hours per day, 5 days per week.

A.2.6 Cost Estimate

Federal construction programs have traditionally distinguished between the capital and O&M costs. The removal action alternatives consist of those activities required to prevent or mitigate the migration of waste into the environment. The removal action may include activities considered to be O&M in situations where construction alone will not achieve the health and environmental protection criteria.

No post-closure or O&M costs are associated with the EE/CA. The post-closure or O&M phase occurs after the completion of the removal action and includes those activities necessary to confirm closure of the removal action or the activities necessary to monitor and prevent releases of hazardous waste into the environment for an indefinite period.

Table A-2 summarizes the total costs for each alternative.

A.2.6.1 Capital Costs

Capital costs are those expenditures required to implement a remedial action and consist of both direct and indirect costs. Capital costs do not include the costs required to maintain or operate the action throughout its lifetime.

A.2.6.1.1 Direct Capital Costs

Direct capital costs include equipment, labor, and material necessary for implementing the remedial action. These typically include costs for:

- Mobilization and demobilization;

- Monitoring, sampling, and analysis during remedial action;
- Surface water and groundwater collection/control during remedial action;
- Solids (soil) collection (excavation)/containment;
- Structure removal;
- Decontamination and decommission;
- Treatment (pretreatment of water);
- Transportation and disposal; and
- Site restoration.

A.2.6.1.2 Indirect Capital Costs

Indirect capital costs consist of engineering, supervision, management, administration, financial and other services necessary to implement a remedial action. These costs are not incurred as part of actual remedial actions but are ancillary to direct or construction costs. Indirect costs typically include:

- Engineering support;
- Project overhead and profit; and
- Program management and technical support.

A.3 Basis Of Cost Estimate

WBS 1. EE/CA-NJDOT ROADWAY IMPROVEMENTS

The following elements from the EE/CA WBS were used as the basis for the cost estimate.

WBS 1.1 Task Management

This item would not be applied to Alternative 1.

For Alternatives 2 and 3 this cost would consist of 6 percent of the total Removal Action cost (WBS 1.3) and the T&D cost (WBS 1.4).

This WBS includes administration, community relations, planning, procurement, training, health and safety, and monitoring costs for the Removal Action.

Monitoring includes air, water, sediment and soil sampling, and testing and analysis. Includes sample collection, shipment, and analysis by onsite and offsite laboratory facilities. Periodic sampling of all media would be conducted to monitor levels of contamination. Duration of one year is estimated for the completion of actual excavation activities. Sampling costs during remedial action activities are based on the annual costs of monitoring of all media. After all excavation activities have been completed, verification sampling of soil would be conducted prior to backfill of the properties to confirm that cleanup criteria have been met.

WBS 1.2 Engineering Support

A cost for Engineering Support would be included for Alternatives 2 and 3 only. This would consist of 4 percent of the sum of the Removal Action cost (WBS 1.3) and the T&D cost (WBS1.4).

WBS 1.3 Remedial Action

This item would not be applied to Alternative 1.

WBS 1.3.1 Mobilization

This includes all preparatory work required during remedial action. This includes submittals; construction plans; mobilization of personnel, facilities, and equipment; construction of temporary facilities; temporary relocations; setup of decontamination facilities and institutional controls.

WBS 1.3.2 Remediation

This includes the demolition and removal during remedial action of solid hazardous, toxic, and radioactive waste (HTRW), and contaminated and noncontaminated structures.

This item provides for excavation of accessible HTRW. A factor of 1.33 was applied to the in-situ volume to calculate the ex-situ volume. This volume considers overexcavation and an expansion factor. It is assumed that soils would be excavated and transported directly to the rail siding located on the MISS. The contaminated soils from the Maywood Site would be excavated using a backhoe/excavator with an adjusted output of 250 yds^3 per 8-hour day and would be either loaded directly into rolloff containers or dump trucks or would be stockpiled for loading. The excavation production rate has been adjusted to compensate for delays, equipment production, air drying of soils if necessary, rail car availability, and job conditions. Other materials such as rocks and oversized debris would be crushed using general excavating equipment. The front-end loader would also be retained onsite to assist with loading and backfill operations.

All equipment would be decontaminated by pressure washing prior to leaving the Maywood Site. The depth of excavation below the existing grade varies from 0 to 10 ft in some areas. Any contact water encountered during excavation would be collected and sent to a wastewater treatment plant. Water trucks would be used as necessary for dust control.

This item provides for all the work associated with the characterization, decontamination, and verification survey of contaminated structures and equipment.

This item provides for the collection and control of contaminated surface water or diversion of non-contaminated surface water through erosion control measures and civil engineering structures such as berms and dikes. Includes the diversion or collection of surface water through tanks and pump systems. Includes transport to treatment plant, if necessary.

The item also provides for the remedial action collection and control of contaminated groundwater through the construction of piping, tanks, and pump systems. Includes transport to treatment plant.

WBS 1.3.3 Local Transportation (off-site to the MISS)

Waste soil, debris, and water would be transported to the MISS for offsite treatment and/or disposal.

WBS 1.3.4 Specialty Remediation

Provides for the replacement and realignment of a stormwater conduit (former Lodi Brook) that is located in areas contaminated with HTRW.

WBS 1.3.5 Site Restoration

Site restoration during remedial action includes topsoil, seeding, landscaping, restoration of roads and parking, and other areas disturbed during site remediation. Backfill and site restoration of the excavated properties would commence upon verification of the cleaned properties to their proper cleanup levels and would run concurrently with excavation activities. For Alternatives 2 and 3, all of the fill material would be imported from offsite and would be placed in 6-inch lifts of loose soils. Compaction of 50 percent of the properties would be accomplished using conventional earth moving equipment. A compactor would be used for the

remaining properties requiring additional compaction. Upon filling the excavated area to within 1 ft of the final grade with clean offsite material (structural fill), the properties would be covered with 6 inches of clean topsoil and restored to their pre-existing conditions (seeding, landscaping, asphalt resurfacing, utilities, etc.).

WBS 1.3.6 Demobilization

This item provides for all work associated with the removal of temporary facilities, utilities, equipment, material, and personnel. Following completion of the removal action phase, all necessary verification and documentation needed for closing the project would be completed (e.g., Post-Remedial Action Report and Certification Dockets). All remediated properties would be reviewed with the appropriate cleanup requirements prior to any release of property restrictions. Those properties meeting the residential criteria would be released without any radiological restrictions. Institutional controls would be employed to control exposure and future land use as necessary for those properties meeting the commercial criteria.

WBS 1.3.7 Treatment

This item provides for a 60 percent volume reduction in the amount of excavated material requiring offsite disposal. A multi-stage process would separate material greater than 0.95-cm (3/8-inch) nominal diameter and radiological sorting of the soil finer than 0.95-cm (3/8-inch) nominal diameter.

WBS 1.4 Waste Transportation and Disposal

This item would not be applied to Alternative 1.

Commercial disposal during the removal action provides for the final placement of HTRW at third-party commercial facilities that charge a fee to accept waste depending on a variety of waste acceptance criteria.

WBS 1.4.1 Transportation and Disposal of Radiological Waste

Soils characterized as radiologically impacted would be transported to an existing rail spur (e.g., the rail spur located at the MISS) with an average distance of 1 mi. from the excavation. Transportation from the individual properties to the rail spur would be via rolloff containers or dump trucks. The rail spur facility is constructed to allow the dump trucks to dump the soils directly onto the containment pad for loading. Soils would be loaded into lined rail cars for off-site transport. This item assumes an availability of six rail cars per day from the rail company. The soils would be transported to a licensed facility authorized to accept radioactive wastes.

WBS 1.4.2 Transportation and Disposal of Commingled Waste

Soils containing both a radiological and hazardous waste would be transported and disposed in a manner similar to WBS 1.4.1.

WBS 1.4.3 Transportation and Disposal of Hazardous Waste

Soils characterized as hazardous waste would be transported to the MISS for off-site treatment and/or disposal. Transportation of hazardous waste from the MISS would likely be by truck.

WBS 1.4.4 Transportation and Disposal of Non-Hazardous Waste

Soil and debris characterized as nonhazardous waste would be transported to a licensed RCRA Subtitle D facility for disposal.

WBS 1.4.5 Transportation and Disposal of Water

Decontamination, surface, and water removed from open excavations would be transported and disposed, if necessary, at a publicly owned treatment works.

Table A-1. Maywood Site Key Removal Action Cost Parameters

Parameter	Alternative 1: No Action	Alternative 2: Excavation & Offsite Disposal	Alternative 3: Excavation, Treatment, & Offsite Disposal
Total in-situ soil (yd^3)[1, 2]	---	31,400	31,400
Total Class 7 radiological waste for disposal (tons)	---	40,820	16,330
Total Class 9 or non-regulated radiological waste for disposal (tons)	---	0	24,500
Total groundwater for disposal (gallons)	---	862,226	862,226
T&D of Class 7 radiological waste ($/ton)	---	166.02	166.02
T&D of Class 9 or non-regulated radiological waste ($/ton)	---	142.20	142.20
Transportation of groundwater to POTW ($/trip)	---	1,697.00	1,697.00
Disposal of groundwater at POTW ($/gal)	---	0.06	0.06

[1]The volume of soil may be different than previously documented because it accounts for contaminated, clean over excavated, and clean side slope material.
[2]The volume estimate assumes that each property would be cleaned up in its entirety.

T&D = Transportation and Disposal
POTW = Publicly Owned Treatment Works

Table A-2. Cost Summary for Alternatives 1, 2, and 3
(Cost in Thousands, $01)

WBS No.	1.0 Activity	Alternative 1: 2.0 No Action	Alternative 2: Excavation & Offsite Disposal[1, 2]	Alternative 3: Excavation, Treatment, & Offsite Disposal[1, 2]
1	**EE/CA**	**0**	**21,872**	**24,984**
1.1	**Task Management**	0	1,172	1,385
1.2	**Engineering Support**	0	782	923
1.3	**Remedial Action**	0	9,918	13,917
1.3.1	Mobilization	0	67	67
1.3.2	Remediation	0	1,004	1,004
1.3.3	Local Transportation to the MISS	0	5,622	5,622
1.3.4	Specialty Remediation	0	122	122
1.3.5	Restoration	0	2,769	2,769
1.3.6	Demobilization	0	334	334
1.3.7	Treatment	0	0	3,999
1.4	**Transportation and Disposal**	0	10,000	8,759
1.4.1	T&D of Radiological Waste	0	9,608	8,367
1.4.2	T&D of Commingled Waste	0	0	0
1.4.3	T&D of Hazardous Waste	0	0	0
1.4.4	T&D of Non-Hazardous Waste	0	0	0
1.4.5	T&D of Water (POTW)	0	392	392

[1] Includes project overhead and profit
[2] The cost estimate assumes that each property would be cleaned up in its entirety.

T&D = Transportation and disposal
POTW = Publicly owned treatment works

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Appendix B

Letters of Consultation Regarding Threatened or Endangered Species

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United States Department of the Interior
FISH AND WILDLIFE SERVICE
Fish and Wildlife Enhancement
927 North Main Street (Bldg. D1)
Pleasantville, New Jersey 08232
Tel: 609-646-9310
FAX: 609-646-0352

IN REPLY REFER TO:

ES-92/184

February 18, 1992

Dr. Richard E. Ambrose
Science Applications International Corporation
P.O. Box 2501, 800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831

Dear Dr. Ambrose:

This letter responds to your January 17, 1992, request to the U.S. Fish and Wildlife Service (Service) for information on the presence of endangered and threatened species within the vicinity of the Maywood Site located in Maywood, Rochelle Park, and Lodi in Bergen County, New Jersey. The Maywood Site is included in the U.S. Department of Energy's Formerly Utilized Site Remedial Action Program and the U.S. Environmental Protection Agency's National Priority List Sites.

This response is provided pursuant to the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) to ensure the protection of endangered and threatened species and is intended to assist your assessments, investigations, and planning being conducted pursuant to Section 104(a) of the Comprehensive Environmental Response, Compensation and Liability Act (P.L. 96-510 94 Stat. 2767) as amended by the Superfund Amendments and Reauthorization Act (42 U.S.C. 9601 et seq.). These comments do not represent any position the U.S. Department of the Interior may adopt concerning possible injury to natural resources under the Department's trusteeship.

Enclosed are current summaries of federally listed and candidate species in New Jersey for your information. Except for an occasional transient bald eagle (*Haliaeetus leucocephalus*) or peregrine falcon (*Falco peregrinus*), no other federally listed or proposed threatened or endangered flora or fauna are known to occur at the Maywood Site. Therefore, no further consultation pursuant to Section 7 of the Endangered Species Act is required by the Service. If additional information on listed and proposed species becomes available or if project plans change, this determination may be reconsidered.

Candidate species are species under consideration by the Service for possible inclusion on the List of Endangered and Threatened Wildlife and Plants. Although these species receive no substantive or procedural protection under the Endangered Species Act, the Service encourages federal agencies and other planners to consider candidate species in the project planning process. The Natural Heritage Program provides the most up-to-date data source for

candidate species in the state, as well as maintaining information on State listed species, and may be contacted at the following address:

Mr. Thomas Breden
Natural Heritage Program
Division of Parks and Forestry
CN 404
Trenton, New Jersey 08625
(609/984-0097)

Should the Natural Heritage Program data search reveal the presence of any candidate species on the site, the Service must be contacted to ensure that these species are not adversely affected by project activities.

Further information on State listed wildlife species may be obtained from the following office:

Ms. JoAnn Frier-Murza
Endangered and Nongame Species Program
Division of Fish, Game and Wildlife
CN 400
Trenton, New Jersey 08625
(609/292-9101)

Information contained in this letter and additional information obtained from the aforementioned sources represents the public interest for fish and wildlife resources and should warrant full consideration in the project planning process. The Service requests that no part of this letter be taken out of context and if reproduced, the letter should appear in its entirety.

Please contact Dana Peters of my staff if you have any questions or require further assistance regarding threatened or endangered species.

Sincerely,

Clifford G. Day
Supervisor

Enclosures

Revised 8/30/91

FEDERALLY LISTED ENDANGERED AND THREATENED SPECIES IN NEW JERSEY

An **ENDANGERED SPECIES** is any species that is in danger of extinction throughout all or a significant portion of its range.

A **THREATENED SPECIES** is any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

FISHES

Sturgeon, shortnose*	*Acipenser brevirostrum*	E

REPTILES

Turtle, Atl. Ridley*	*Lepidochelys kempii*	E
Turtle, green*	*Chelonia mydas*	T
Turtle, hawksbill*	*Eretmochelys imbricata*	E
Turtle, leatherback*	*Dermochelys coriacea*	E
Turtle, loggerhead*	*Caretta caretta*	T

BIRDS

Eagle, bald	*Haliaeetus leucocephalus*	E
Falcon, Am. peregrine	*Falco peregrinus anatum*	E
Falcon, Arctic peregrine	*Falco peregrinus tundrius*	T
Plover, piping	*Charadrius melodus*	T
Tern, roseate	*Sterna dougallii dougallii*	E

MAMMALS

Whale, blue*	*Balaenoptera musculus*	E
Whale, finback*	*Balaenoptera physalus*	E
Whale, humpback*	*Megaptera novaeangliae*	E
Whale, right*	*Balaena glacialis*	E
Whale, sei*	*Balaenoptera borealis*	E
Whale, sperm*	*Physeter catodon*	E

INVERTEBRATES

Dwarf wedge mussel	*Alasmidonta heterodon*	E+
Beetle, northeastern beach tiger	*Cicindela dorsalis dorsalis*	T+
Butterfly, Mitchell satyr	*Neonympha m. mitchellii*	E+
American burying beetle	*Nicrophorus americanus*	E+

PLANTS

Pogonia, small whorled	*Isotria medeoloides*	E
Swamp pink	*Helonias bullata*	T
Orchid, eastern prairie fringed	*Platanthera leucophaea*	T+
Knieskern's beaked rush	*Rhynchospora knieskernii*	T
American chaffseed	*Schwalbea americana*	PE
Joint-vetch, sensitive	*Aeschynomene virginica*	PT

STATUS:

E: endangered species
T: threatened species
+: presumed extirpated
PE: proposed endangered
PT: proposed threatened

* Except for sea turtle nesting habitat, principal responsibility for these species is vested with the National Marine Fisheries Service.

Note: for a complete listing of Endangered and Threatened Wildlife and Plants refer to 50 CFR 17.11 and 17.12, January 1, 1989)

CANDIDATE SPECIES IN NEW JERSEY

CANDIDATE SPECIES are species that appear to warrant consideration for addition to the List of Endangered and Threatened Wildlife and Plants. Although these species receive no substantive or procedural protection under the Endangered Species Act, the Service encourages federal agencies and other planners to give consideration to these species in the environmental planning process.

VERTEBRATES

Turtle, bog	Clemmys muhlenbergi	2
Terrapin, northern diamondback	Malaclemys terrapin terrapin	2
Snake, northern pine	Pituophis melanoleucas melanoleucas	2
Shrike, migrant loggerhead	Lanius ludovicianus migrans	2
Bat, eastern small-footed	Myotis subulatus leibii	2
Rabbit, New England cottontail	Sylvilagus transitionalis	2
Shrew, long-tailed	Sorex dispar	2
Shrew, Tuckahoe masked	Sorex cinereus nigriculus	2
Woodrat, eastern	Neotoma floridana magister	2

INVERTEBRATES

Beetle, cobblestone tiger	Cicindela marginipennis	2
Butterfly, regal fritillary	Speyeria idalia	2
Butterfly, tawny crescent	Phyciodes batesi	2
Dragonfly, banded bog skimmer	Williamsonia lintneri	2
Moth, Albarufan dagger	Acronicta albarufa	2
Moth, Bucholz' dart	Agrotis bucholzi	2
Moth, Daecke's pyralid	Crambus daeckeellus	2*
Moth, Hebard's noctuid	Erythroecia hebardi	2
Moth, Lemmer's noctuid	Lithophane lemmeri	2
Moth, precious underwing	Catocala pretiosa	2

PLANTS

Blazingstar	Liatris borealis	2
Bog asphodel	Narthecium americanum	1
Boneset, Pine Barrens	Eupatorium resinosum	2
Bulrush, Long's	Scirpus longii	2
Butternut	Juglans cinerea	2
Chaffseed	Schwalbea americana	PE
Joint-vetch, sensitive	Aeschynomene virginica	PT
Lobelia, Boykin's	Lobelia boykinii	2
Meadowbeauty, awned	Rhexia aristosa	2

Meadowbeauty, awned	Rhexia aristosa	2
Micranthemum, Nuttall's	Micranthemum micranthemoides	1*
Morning-glory, Pickering's	Stylisma pickeringii var. pickeringii	2
Panic grass, Hirst's	Panicum hirstii	2
Pigweed, sea-beach	Amaranthus pumilus	2
Pondweed	Potamogeton confervoides	2
Rush, New Jersey	Juncus caesariensis	2
Sedge, variable	Carex polymorpha	2
Spring beauty	Claytonia sp.	2
Spurge, Darlington's	Euphorbia purpurea	2
Tick-trefoil, ground-spreading	Desmodium humifusum	2
Verbena	Verbena riparia	2?

STATUS:

1: Taxa for which the Service currently has substantial information to support the appropriateness of proposing to list the species as threatened or endangered. Development and publication of proposed rules on these species is anticipated.

2: Taxa for which information now in possession of the Service indicates that proposing to list the species as threatened or endangered is possibly appropriate, but for which conclusive data are not available to support proposed rules at this time.

PE: Proposed Endangered species

PT: Proposed Threatened species

* indicates those species for which there have been no authenticated records in New Jersey since 1963; some of these are possibly extinct, but further research is needed to determine their status with any confidence.

? indicates those species for which occurrence in New Jersey is questionable.

Note: for complete listings of taxa under review, refer to Federal Register Vol. 54, No. 4, January 6, 1989 (Animal) and Vol. 55., No. 35, February 21, 1990 (Plants).

State of New Jersey
Department of Environmental Protection and Energy
Division of Parks and Forestry
Office of Natural Lands Management
CN 404 Trenton New Jersey 08625-0404
(609) 984-1339
FAX (609) 984-1427

Scott A. Weiner
Commissioner

October 25, 1991

Debbie Spiers
Science Applications International Corp.
14062 Denver West Parkway #110
Golden, Colorado 80401

Re: Maywood Site

Dear Ms. Spiers:

Thank you for your data request regarding rare species information for the above referenced project site in Bergen County.

The Natural Heritage Data Base does not have any records for rare plants, animals or natural communities on the site. The attached list of rare species is from records in the general vicinity of the project site (within approx. 3 mi. for animals, 1.5 mi. for plants and communities). Additionally, enclosed is a list of rare vertebrates of Bergen County together with a description of their habitats. If suitable habitat is present at the project site, these species would have potential to be present. If you have questions concerning the wildlife records or wildlife species mentioned in this response, we recommend you contact the Division of Fish, Game and Wildlife Endangered and Nongame Species Program.

PLEASE SEE THE ATTACHED 'CAUTIONS AND RESTRICTIONS ON NHP DATA'.

Thank you for consulting the Natural Heritage Program. The fee to cover the cost of processing this data request is $30.00. Payment should be made payable to Treasurer, State of New Jersey and mailed to Office of Natural Lands Management, DEPE Div. of Parks and Forestry, CN404, Trenton, NJ 08625-0404. To ensure that your payment is properly credited, please provide a copy of this letter with your remittance. Feel free to contact us again regarding any future data requests.

Sincerely,

Elena A. Williams

Elena A. Williams
Senior Planner
Natural Heritage Program

cc: JoAnn Frier-Murza
Thomas Hampton

CAUTIONS AND RESTRICTIONS ON NATURAL HERITAGE DATA

The quantity and quality of data collected by the Natural Heritage Program is dependent on the research and observations of many individuals and organizations. Not all of this information is the result of comprehensive or site-specific field surveys. Some natural areas in New Jersey have never been thoroughly surveyed. As a result, new locations for plant and animal species are continuously added to the data base. Since data acquisition is a dynamic, ongoing process, the Natural Heritage Program cannot provide a definitive statement on the presence, absence, or condition of biological elements in any part of New Jersey. Information supplied by the Natural Heritage Program summarizes existing data known to the program at the time of the request regarding the biological elements or locations in question. They should never be regarded as final statements on the elements or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments. The attached data is provided as one source of information to assist others in the preservation of natural diversity.

This office cannot provide a letter of interpretation or a statement addressing the classification of wetlands as defined by the Freshwater Wetlands Act. Requests for such determination should be sent to the DEP Division of Coastal Resources, Bureau of Freshwater Wetlands, CN 402, Trenton, NJ 08625.

This cautions and restrictions notice must be included whenever information provided by the Natural Heritage Database is published.

GENERAL VICINITY OF PROJECT SITE
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK	DATE OBSERVED	IDENT.
*** Vertebrates								
AMMODRAMUS SAVANNARUM	GRASSHOPPER SPARROW		T/T		G4	S2	[redacted]	Y
CLEMMYS MUHLENBERGII	BOG TURTLE	C2	E		G3	S2	[redacted]	Y
*** Vascular plants								
CAREX ROSTRATA	BEAKED SEDGE				G5	S2	[redacted]	Y
LIMOSA PERPUSILLA	MINUTE DUCKWEED				G5	SH	[redacted]	Y
MELANTHIUM VIRGINICUM	VIRGINIA BUNCHFLOWER		E		G5	S1	[redacted]	Y
TROLLIUS LAXUS SSP LAXUS	SPREADING GLOBE FLOWER	3C	E		G4T3Q	S1	[redacted]	Y
VERBENA SIMPLEX	NARROW-LEAVED VERVAIN		E		G5	SH	[redacted]	Y

7 Records Processed

5/18/87

NEW JERSEY NATURAL HERITAGE PROGRAM
POTENTIAL THREATENED AND ENDANGERED VERTEBRATE SPECIES
IN BERGEN COUNTY

AMERICAN BITTERN BOTAURUS LENTIGINOSUS	FEDERAL STATUS: STATE STATUS: LT	COUNTY OCCURRENCE: ?

HABITAT COMMENTS
Fresh water bogs, swamps, wet fields, cattail and bulrush marshes, brackish and saltwater marshes and meadows.

BALD EAGLE HALIAEETUS LEUCOCEPHALUS	FEDERAL STATUS: LELT STATE STATUS: LE	COUNTY OCCURRENCE: T*

HABITAT COMMENTS
Primarily near seacoasts, rivers, and large lakes.

BARRED OWL STRIX VARIA	FEDERAL STATUS: STATE STATUS: LT	COUNTY OCCURRENCE: W

HABITAT COMMENTS
Dense woodland and forest (conif. or hardwood), swamps, wooded river valleys, cabbage palm-live oak hammocks, especially where bordering streams, marshes, and meadows.

BOG TURTLE CLEMMYS MUHLENBERGII	FEDERAL STATUS: C2 STATE STATUS: LE	COUNTY OCCURRENCE: Y

HABITAT COMMENTS
Slow, shallow rivulets of sphagnum bogs, swamps, and marshy meadows; sea level to 1200 m in Appalachians. Commonly basks on tussocks in morning in spring and early summer. Hibernates in subterreanean rivulet or seepage area.

BROOK TROUT SALVELINUS FONTINALIS	FEDERAL STATUS: STATE STATUS: LT	COUNTY OCCURRENCE: Y

HABITAT COMMENTS
Clear cool well-oxygenated streams and lakes. May move from streams into lakes or sea to avoid high temps. in summer.

COOPER'S HAWK ACCIPITER COOPERII	FEDERAL STATUS: STATE STATUS: LE	COUNTY OCCURRENCE: Y

HABITAT COMMENTS
Primarily mature forest, either broadleaf or coniferous, mostly the former; also open woodland and forest edge.

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GRASSHOPPER SPARROW
AMMODRAMUS SAVANNARUM
FEDERAL STATUS:
STATE STATUS: LT
COUNTY OCCURRENCE: B

HABITAT COMMENTS
Prairie, old fields, open grasslands, cultivated fields, savanna.

GREAT BLUE HERON
ARDEA HERODIAS
FEDERAL STATUS:
STATE STATUS: LT
COUNTY OCCURRENCE: N*

HABITAT COMMENTS
Freshwater and brackish marshes, along lakes, rivers, bays, lagoons, ocean beaches, mangroves, fields, and meadows.

LONGTAIL SALAMANDER
EURYCEA LONGICAUDA
FEDERAL STATUS:
STATE STATUS: LT
COUNTY OCCURRENCE: ?

HABITAT COMMENTS
Streamsides, spring runs, cave mouths, forested floodplains in South. May disperse into wooded terrestrial habitats in wet weather. Hides under rocks, logs, and other debris.

NORTHERN GOSHAWK
ACCIPITER GENTILIS
FEDERAL STATUS:
STATE STATUS: LT
COUNTY OCCURRENCE: W*

HABITAT COMMENTS
Deciduous and coniferous forest, forest edge and open woodland, foraging also in cultivated regions; primarily in mountains towards the south.

NORTHERN HARRIER
CIRCUS CYANEUS
FEDERAL STATUS:
STATE STATUS: LE
COUNTY OCCURRENCE: Y

HABITAT COMMENTS
Marshes, meadows, grasslands, and cultivated fields. Perches on ground or on stumps or posts.

OSPREY
PANDION HALIAETUS
FEDERAL STATUS:
STATE STATUS: LT
COUNTY OCCURRENCE: T*

HABITAT COMMENTS
Primarily along rivers, lakes, and seacoasts, occurring widely in migration, often crossing land between bodies of water.

PIED-BILLED GREBE
PODILYMBUS PODICEPS
FEDERAL STATUS:
STATE STATUS: LE
COUNTY OCCURRENCE: Y

HABITAT COMMENTS
Lakes, ponds, sluggish streams, and marshes; in migration and in winter also in brackish bays and estuaries.

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RED-HEADED WOODPECKER
MELANERPES ERYTHROCEPHALUS
FEDERAL STATUS:
STATE STATUS: LT
COUNTY OCCURRENCE: ?

HABITAT COMMENTS
Open woodland, especially with beech or oak, open situations with scattered trees, parks, cultivated areas and gardens.

RED-SHOULDERED HAWK
BUTEO LINEATUS
FEDERAL STATUS:
STATE STATUS: LT
COUNTY OCCURRENCE: Y

HABITAT COMMENTS
Moist and riverine forest, and in e. N. Am. in wooded swamps, foraging in forest edge and open woodland.

SAVANNAH SPARROW
PASSERCULUS SANDWICHENSIS
FEDERAL STATUS:
STATE STATUS: LT
COUNTY OCCURRENCE: Y

HABITAT COMMENTS
"Open areas, especially grasslands, tundra, meadows, bogs, farmlands, grassy areas with scattered bushes, and marshes, including salt marshes in the BELDINGI and ROSTRATUS groups (Subtropical and Temperate zones)".

SEDGE WREN
CISTOTHORUS PLATENSIS
FEDERAL STATUS:
STATE STATUS: LE
COUNTY OCCURRENCE: ?

HABITAT COMMENTS
Grasslands and savanna, especially where wet or boggy, sedge marshes, locally in dry cultivated grainfields. In migration and winter also in brushy grasslands.

SHORT-EARED OWL
ASIO FLAMMEUS
FEDERAL STATUS:
STATE STATUS: LE/S
COUNTY OCCURRENCE: W*

HABITAT COMMENTS
Open country, including prairie, meadows, tundra, moorlands, marshes, savanna, dunes, fields, and open woodland. Roosts by day on ground or on low open perches.

TIMBER RATTLESNAKE
CROTALUS HORRIDUS
FEDERAL STATUS:
STATE STATUS: LE
COUNTY OCCURRENCE: Y

HABITAT COMMENTS
Wooded rocky hillsides in north; swampy areas, canebrake thickets, and floodplains in south. Near streams in late summer in some areas. Often hibernates in burrows and crevices of rock outcroppings.

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UPLAND SANDPIPER
BARTRAMIA LONGICAUDA

FEDERAL STATUS:
STATE STATUS: LE

COUNTY OCCURRENCE: B

HABITAT COMMENTS
Grasslands, especially prairies, dry meadows, pastures, and (in Alaska) scattered woodlands at timberline; very rarely in migration along shores and mudflats.

VESPER SPARROW
POOECETES GRAMINEUS

FEDERAL STATUS:
STATE STATUS: LE

COUNTY OCCURRENCE: Y

HABITAT COMMENTS
"Plains, prairie, dry shrublands, savanna, weedy pastures, fields, sagebrush, arid scrub and woodland clearings."

WOOD TURTLE
CLEMMYS INSCULPTA

FEDERAL STATUS:
STATE STATUS: LT

COUNTY OCCURRENCE: Y

HABITAT COMMENTS
Vicinity of streams and rivers. In streams and in wooded areas and fields adjacent to streams in summer. In streams in spring and fall. Hibernates in banks or bottoms of streams in winter.

DEFINITION OF ACRONYMS

FEDERAL STATUS

LE=listed endangered.
LT=listed threatened.
PE=proposed endangered.
PT=proposed threatened.
C2=candidate for listing.

STATE STATUS

LE=listed as endangered. (short-eared owl winter pop. listed as stable:S)
LT=listed as threatened.

COUNTY OCCURRENCE

Y=present year-round, breeds.
N=present year-round, not recorded breeding.
B=present during the summer, breeds.
W=present during the winter.
T=present as a transient.
?=present status undetermined.
*=indicates that the county is within the species known breeding range.

State of New Jersey
Department of Environmental Protection and Energy
Natural and Historic Resources
Division of Parks and Forestry
Office of New Jersey Heritage
CN 404
Trenton, NJ 08625-0404
Tel. # 609-292-2023
Fax. # 609-292-8115

Scott A. Weiner
Commissioner

James F. Hall
Assistant Commissioner

ONJH-B92-7

February 27, 1992

Richard E. Ambrose, Ph.D.
Senior Staff Scientist
Science Applications International Corporation
P.O. Box 2501
Oak Ridge, TN 37831

Bergen County, New Jersey
Maywood Borough [+Lodi Borough & Rochelle Park Township]
Maywood Chemical Works- Maywood Interim Storage + Vicinity
Feasibility Study-Environmental Impact Statement
Formerly Utilized Sites Remedial Action Program
U.S. Department of Energy

National Priority List
Comprehensive Environmental Response, Compensation, and Liability Act
Superfund Amendment Reauthorization Act of 1986 [P.L.99-499]
U.S. Environmental Protection Agency, Region II

Dear Dr. Ambrose:

In reply to your request of January 17, I would like to request information as described herein and as checked off on the accompanying schedule.

1. Maywood Interim Storage Site (= Maywood Chemical Works; then called Stepan [sic] Company). Please confirm that the only undertaking here ("action") is the temporary storage in the northern corner of contaminated soil which eventually will be transported. If this is not the case, please explain.

2. The twenty-five properties that have already been fully decontaminated: please describe the action that has been accomplished and in color mark the properties on your Figure 2.

3. The one partially decontaminated project: what has been done, what will be done, and where is it located on Figure 2?

4. "... the 56 properties not yet fully decontaminated". Please color-code these on Figure 2.

In accordance with your request I am furnishing information in my records, derived from the Bergen County Historic Sites Survey 1984-1985, a "reconnaissance-level" inventory of potentially significant buildings.

Maywood Borough -0234

0234-9 West side of Maywood Avenue, South of West Hunter Avenue, Maywood Chemical Company complex (Pfizer and Stefan), 1920-present.

"Industrial vernacular; 1 and 2; brick; regular bays, pilasters between bays; gables, pitches vary, brick cornices. This complex of industrial buildings is an [sic] remnant of Maywood's industrial past. At the turn-of-the [sic] century a number of chemical manufacturers located in the community and this complex is the most interesting physical reminder of them. The Pfizer buildings are going to be demolished for an office and warehouse building. Demolished prior to 2-82"

"Level of Significance: Matrix: A building with historical significance as part of the general development of the area which also has architectural significance due to style, size, rarity of design, or rarity of building type".

0234-10 South side of West Hunter Avenue, West of Maywood Avenue, Peerless Engine Company #2 Firehouse. 1908.

"Vernacular firehouse; 2; brick; 1 bay, garage door on 1st story, triple window on 2nd; gable; corner pilasters, pediment; 1-story addition at east. This unpretentious building is a representative example of an early 20th c. firehouse in a small town".

"Level of Significance: Matrix..."

Lodi Borough -0231

No properties inventoried by Bergen County.

Rochelle Park Borough -0254

0254 -1 St. Peter's Episcopal Chapel, NE corner of Rochelle Avenue and Beeker Avenue. Deemed by the survey to be National Register Eligible as part of a historic district.

-2 106 Rochelle Avenue.

-3 Van der Horn House, 8 Lexington Avenue.

-4 26 St. Ann's Place.

-5 66 Park Way. Possibly eligible

-6 C. Devon House, 101 Rochelle Avenue.

-7 Rochelle Park Railroad Station, Railroad Avenue. Considered possibly eligible by the survey.

I recommend that a background study for cultural resources be carried out by an investigator who meets the National Park Service's Professional Qualifications Standards (attached), for the relevant discipline(s).

When I have received the requested information I shall be able to continue my review.

The project reviewer is Mr. Jonathan Gell.

Sincerely yours,

C. Terry Pfoutz

C. Terry Pfoutz
State Historic
Preservation Specialist

CTP:vs

Attachment

c. Mr. John Vetter, Environmental Impacts, U.S. E.P.A.

Disk#4A:\B92-7

State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF PARKS AND FORESTRY
OFFICE OF NEW JERSEY HERITAGE
CN 404
TRENTON, NJ 08625
(609) 292-2023

PROJECT Bergen County, New Jersey. Maywood Borough [+Lodi Borough & Rochelle Park Township] Maywood Chemical Works &c. Feasibility Study-E.I.S. F.U.S.R.A.P. U.S. Departmentof Energy "Superfund"

ONJH PROJECT CONTACT Mr. Jonathan Gell DATE OF REQUEST 6 February 1992

OFFICE OF NEW JERSEY HERITAGE
INFORMATION REQUESTED FOR PROJECT REVIEWS

The Office of New Jersey Heritage needs to receive the following information in order to review your project. If you have already submitted project information to the Office, additional information should be submitted for those areas which are checked. If you have any questions regarding the information requested, please contact the Office of New Jersey Heritage project contact. FAXED information is generally not acceptable.

The formal project title (and short description by which it is known).

Any official project identification numbers.

The county and municipality where the project is located.

Project neighborhood location and street address.

✓ U.S.G.S. Topographic Quadrangle maps and sheet titles, illustrating the project location and surrounding area. The project location should be clearly and accurately delineated on the U.S.G.S. quadrangle sheet, and if appropriate, other map sources of equivalent accuracy and scale. As appropriate, a photocopied 8 1/2 inch by 11 inch map section may be used; however, the reproduction must be very sharp. The title of the quadrangle sheet and date of the edition must be included.

The federal agency (and "program") funding, licensing, permitting, reviewing, or undertaking the project.

✓ The names and addresses of State, Federal, or other project sponsors.

Other source(s) of project funds.

✓ The federal official responsible for the undertaking: title name, address, phone.

Project manager or contact person, address, and telephone number.

The name(s) of the administrative official(s) and address(es) of the project's municipality or county (e.g. the mayor or other municipal official who may be involved with the review or implementation of the project, and municipal contacts for historic preservation).

Names and addresses of historic preservation consultant or other pertinent project consultants (e.g. engineering, environmental, or planning consultants).

Previous related projects or project portions, and anticipated sequels to this project or project phase.

Project schedule, critical dates.

A narrative project description and detailed project plans: describing and illustrating the project including its areal extent, whether razing existing buildings or structures would be part of the project, and a description of related activities associated with the project (for example, construction of access roads or paved parking areas, the locations of construction laydown or equipment storage areas).

A description of the project site's natural environment including terrain, on-site drainages, soil types, and vegetation.

A description of the project site as it exists today and previous uses of this piece of land, providing information as far back in history and as well documented as possible. This should include a detailed description of the existing and previous on-site buildings and structures, paved areas, and other information to provide a description of the current and former site conditions particularly ground disturbance. The description should be accompanied by a detailed site plan illustrating the project, as well as any important or notable buildings and landscape features.

A discussion of representative buildings in the project vicinity including their current and former uses and approximate dates of construction. For buildings older than fifty years and visible from the project site, clear color or black and white photographs (3" by 5" or larger) and descriptions are necessary. Polaroid photographs are not acceptable. If there are many older buildings (as in a streetscape), they may be grouped in sets of two or three, provided that each is clearly visible. Each print should be captioned and numbered in

a continuous sequence. A sketch map of the project area should be keyed to the photographs to illustrate the location and orientation of the camera for each.

A set of clear photographs, 4" by 6" or larger (Polaroid photographs are not acceptable): OF TYPICAL AND REPRESENTATIVE STRUCTURES AND STREETSCAPES IN THE SEVERAL SUBDIVISIONS OF THE PROJECT

a. ~~taken from outside the project site looking inward to illustrate ground conditions and on-site buildings, structures, and landscape elements, etc; and~~

b. ~~taken on-site looking outward to illustrate the project vicinity, e.g. in the four cardinal directions or their equivalent.~~

Each print should be captioned and numbered. As above, the photographs should be numbered, and the sketch map of the project area should be keyed to the photographs to illustrate the location and orientation of the camera for each.

A detailed statement of the likely effects of the project on historic sites, landscapes, and buildings, and archaeological sites, both on the project site and in its vicinity must be included. If you believe that your project will have no effect on properties listed in or eligible for listing in the National Register of Historic Places, this should be stated and justified in your submission.

Additional information or comments

ER:drf4:proinfo1

Department of Energy

Oak Ridge Operations
P.O. Box 2001
Oak Ridge, Tennessee 37831—8723

April 21, 1994

Mr. Jonathan Gell
State of New Jersey Department of
Environmental Protection and Energy
Natural and Historic Resources
Division of Parks and Forestry
Office of New Jersey Heritage
CN 404
Trenton, New Jersey 08625-0404

Dear Mr. Gell:

MAYWOOD SITE - TRANSMITTAL OF THE STATE IA ARCHAEOLOGICAL AND HISTORICAL STUDY

The purpose of this letter is to transmit one copy of the Phase IA Archaeological and Historical Study of the Maywood Site. The study concludes that although the buildings on the Maywood Interim Storage Site (MISS) and Stepan appear eligible for the National Register of Historic Places as a district, the decontamination measures would have no effect on the buildings. Although the demolition of building 76 on MISS would have an adverse effect by removing a contributing building to the district, an appropriate mitigation measure may be to document the building with large format black and white archival photographs. In addition, no further archaeological research is recommended.

Your approval or comments are requested by May 16, 1994, to meet the scheduled publication date of the Feasibility Study and Proposed Plan. If you have any questions, or if I can be of any assistance, please contact me at (615) 576-5724. Your cooperation is appreciated.

Sincerely,

Susan M. Cange

Susan M. Cange, Site Manager
Former Sites Restoration Division

Enclosure

Department of Energy

Oak Ridge Operations
P.O. Box 2001
Oak Ridge, Tennessee 37831—8723

July 8, 1994

Jonathan Gell
State of New Jersey
Department of Environmental Protection
Division of Parks and Forestry
CN 404
Trenton, New Jersey 08625

Dear Mr. Gell:

MAYWOOD SITE - STAGE 1A ARCHAEOLOGICAL AND HISTORICAL STUDY REPORT

The purpose of this letter is to forward comments received from the Environmental Protection Agency (EPA) on the subject document and to inquire as to the status of your review of the report. I would appreciate any guidance that you can provide to me on the resolution of these comments. Further, if you think it is necessary, I would like to arrange for a meeting, as suggested by EPA, to review the steps necessary to comply with NHPA. I would appreciate hearing from you as soon as possible so that we can resolve any outstanding issues before signing a Record of Decision for the site.

I look forward to hearing from you. My telephone number is (615) 576-5724.

Sincerely,

Susan M. Cange

Susan M. Cange, Site Manager
Former Sites Restoration Division

Enclosure

cc: Jeff Gratz, EPA
Nick Marton, NJDEP

116936

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION II

JACOB K. JAVITS FEDERAL BUILDING

NEW YORK, NEW YORK 10278-0012

MAY 2 6 1994

Ms. Susan Cange
New Jersey Site Manager
Former Sites Restoration Division
Department of Energy
P.O. Box 2001
Oak Ridge, TN 37831-8723

Re: EPA Review of DOE's Draft *Stage 1A Archaeological and Historical Study of the Maywood Site*

Dear Ms. Cange:

The U.S. Environmental Protection Agency (EPA) has reviewed the U.S. Department of Energy (DOE) draft *Stage 1A Archaeological and Historical Study of the Maywood Site* (April, 1994), prepared for DOE by Science Applications International Corporation. We have the following comments:

1. The report indicates that the Maywood Site may qualify for inclusion in the National Register of Historic Places (National Register) as an historic district. However, the report does not state the appropriate steps that DOE will take, as a lead federal agency, to comply with the subsequent requirements of the National Historic Preservation Act (NHPA). Initially, a determination of eligibility for the National Register must be made in consultation with the New Jersey State Historic Preservation Officer (SHPO). At a minimum, this requires preparation of a report, accompanied by appropriate graphic documentation, detailing the nature and significance of the resource.

   If National Register eligibility is confirmed with the SHPO, a determination of effect should be made based upon the remedial actions which are anticipated to be implemented. The results of the effect determination are then evaluated to guide development of appropriate mitigation measures. Please note that mitigation through data recordation is more detailed than is suggested in the report, and that it cannot be accomplished by depositing a few photographs in the Stepan Company archives. Rather, there are specific data recordation requirements which must be met and coordinated with the U.S. Department of the Interior. We recommend that DOE contact the SHPO to arrange a meeting to review the steps associated with compliance with the NHPA for this site.

2. Information is presented on the historic settlement of the project area. However, the mapped information presented concerning the structures associated with the site (in particular, the Schaefer Works and the Maywood Chemical Works) does not clearly

illustrate the many changes which took place between their initial and current configurations. Utilization of graphic overlay techniques would have been a more appropriate approach to demonstrate the features of the industrial complex and is recommended for any associated follow up reports.

3. We have 2 concerns regarding the study's consideration of prehistoric resources:

   - The background review concludes that it is not possible to assess archeological sensitivity within the project area due to lack of data. This conclusion appears inconsistent with the reported presence of riverine features during prehistoric times. This inconsistency between the characterizations based on the prehistoric setting and the contemporary configuration should be addressed and resolved.

   - Soil boring data collected in conjunction with contaminant measurements was used to determine the presence or absence of archeological materials. While this technique can be quite effective when carried out with oversight by professional archaeologists, during the Maywood investigation no archaeologists were present and locations of the boring samples were keyed to the needs of the contaminant survey, not with the objective of investigating archaeological features of either the prehistoric or historic periods. Thus, the use of data from these borings appears to be inconclusive. Also, ground truth exploration should have been conducted to confirm the effectiveness of the soil borings.

We are willing to participate in a meeting to discuss the above concerns and comments. If you have any questions, please call me at (212) 264-6667.

Sincerely,

Jeffrey Gratz, Project Manager
Federal Facilities Section

cc: N. Marton, NJDEPE

136423

Department of Energy

Oak Ridge Operations
P.O. Box 2001
Oak Ridge, Tennessee 37831—8723

November 8, 1995

Mr. Michael Gregg
New Jersey Department of Environmental Protection
Division of Parks and Forestry
CN 404
Trenton, New Jersey 08625

Dear Mr. Gregg:

MAYWOOD SITE - STAGE IA ARCHAEOLOGICAL STUDY AND STAGE IIA HISTORICAL STUDY

The Stage IA Archaeological Study and Stage IIA Historical Study of the Maywood site has been completed. The conclusions in the report indicate that 14 of the buildings associated with the Maywood site appear to be eligible for the National Register of Historic Places (NRHP) as a district. Seven of these buildings, located on the Stepan property, are contaminated and will require interior decontamination. Another of these buildings, the warehouse (Building 76) at the Maywood Interim Storage Site, has contaminated soil beneath it that will probably require demolition of the building.

The buildings on the Stepan property appear eligible for the NRHP as a district for their architectural merit. However, the decontamination techniques will not affect the integrity of the materials, workmanship, and association of the buildings. Therefore, the types of decontamination techniques that would be used would have no effect on the buildings. Additional research was conducted on Building 76 to evaluate the impacts of demolition. Further comparison of the building construction date, building use, building materials, and significance of the building with the NRHP eligibility criteria, indicates that the warehouse is not a primary building having architectural merit or direct association to the historical district. A memorandum prepared by Alex Cole, the principal author of the historical study, outlining this information is enclosed. Based on her research we have reached the conclusion that no further National Historic Preservation Act (NHPA) documentation is necessary to complete remediation of this site.

A copy of the archaeological and historical study is enclosed for review and record retention purposes. Please note that this document was previously submitted to Mr. Jonathan Gell for review and comment. However, no comments were received and we have proceeded with finalizing this document. Please provide any comments you may have concerning this document or the conclusions that have been reached by December 8, 1995. If you have no comments, submittal of this document will conclude the Section 106 NHPA requirements for the Maywood site and a copy of the report will be submitted to the Administrative Record for the Maywood site and will be made available to the public.

If you have any questions or comments, please contact me at (423) 576-5724.

Sincerely,

Susan M. Cange, Site Manager
Former Sites Restoration Division

Enclosures

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION
ENVIRONMENTAL PROGRAMS DIVISION

MEMORANDUM

TO: *Heather Cothron*

FROM: *Alex Cole*

SUBJECT: *Building 76, MISS Property*

DATE: *October 10, 1995*

The Stage IA Archaeological Study and Stage II Historical Study of the Maywood Site (July 1995) indicated that Building 76 was potentially eligible for the NRHP as a contributing member to a potential Maywood Chemical Company Historic District under Criteria A and C of the National Register of Historic Places (NRHP) criteria. Further clarification of its level of significance in comparison with the other buildings within the district was requested. This memo provides additional information and evaluation of building 76.

Building Date. In the absence of building permits for Building 76 (as for all the buildings), its date of construction was estimated using historical maps and site plans and an aerial photograph of the site. The aerial view, dating to 1928, shows that the building is not there. A Sanborn Map dating from 1926 corrected to 1950, and a site map of 1951 show the building in place. Two other buildings in the district date from this 1928-1951 time period, building 78, the Navy building, constructed in the 1940s, and the garage. The remaining buildings date between 1910 and 1928. It is difficult to date a vernacular building, such as this warehouse, that used common building materials of corrugated metal; it is this consultant's view that the building was built in the 1940s.

Building Use. The Sanborn Map of 1926 corrected to 1950 lists the building as a factory building. The 1951 site plan of Maywood Chemical Company, a more accurate source, however, lists the building as a warehouse. There were two other warehouses adjacent to the building to the west, that were demolished in the 1970s, possibly indicating that this was a warehouse section of the property.

Building Material. Building 76 is corrugated metal over a wood frame. It is the only building in the district of this material, and is representative of the large number of iron clad manufacturing and warehouse buildings that formerly stood on the site. The remainder of the buildings are of brick, or in the case of the garage, of concrete block.

Building Significance. The building is a contributing property to a district potentially significant at the local level under Criterion A of the NRHP for its association with the chemical industry which was a strong factor in the growth and development of Maywood in the late nineteenth and early twentieth centuries. The dates of significance have been determined as 1910, when the

816 State Street, Suite 500, Santa Barbara, California 93101 (805) 966-0811

Maywood Chemical Company was founded, through the 1940s when the Navy commissioned building 78. The Company was known for its extraction of lithium, thorium, caffeine and cocaine, and the production of detergents, alkaloids, essential oils, and flavoring extracts for soft drinks. This building is not directly associated with a particular process or substance, being listed as a warehouse or factory building. With the exception of the garage, the remaining buildings within the district are associated with specific processes: #1 was used to store coca leaves and manufacture cocaine; #4 was the boiler plant; #10 was used to extract caffeine from tea waste through the use of toluol; #10H was used for experimental alcohol extraction of cocoa products; #14 was a laboratory; #20 was used to crystallize and grind caffeine; #52 contained reducing furnaces; #52A served as storage for lithium ore; #67 was used to manufacture lithia salts; #78 was used to process rare earth salts to manufacture lithium hydroxide. Within this context of use, Building 76 is the only facility not connected to a specific chemical manufacturing process.

Building 76 is a contributing property to a district potentially significant additionally under Criterion C of the NRHP; such a district represents a "significant and distinguishable entity whose components may lack individual distinction." Criterion C evaluates architectural merit; in the case of a district it evaluates the architectural merit of the buildings as a group where none of the buildings would be considered outstanding if treated individually. The greatest concentration of buildings with architectural merit are the brick buildings from the 1920s with their piers and corbelled cornices. Building #76, the only corrugated metal building in the district, does not have architectural merit but is included for its associative merit as a representative of the many iron clad buildings that formerly were on the site.

Within the context of the proposed district, it is the consultant's opinion that Building 76, with the garage and Building 78, are considered secondary buildings. Building 76 served as a warehouse, rather than a specialized manufacturing plant, and as a vernacular building, contains no specific architectural elements of style. The brick buildings dating from the 1920s are considered primary buildings, notable for their architectural merit and for their direct association with the chemical industry, through the type of manufacturing housed within them.

Christine Todd Whitman
Governor

State of New Jersey
Department of Environmental Protection
DIVISION OF PARKS AND FORESTRY
HISTORIC PRESERVATION OFFICE
CN-404
TRENTON, N.J. 08625-0404
TEL: (609) 292-2023
FAX: (609) 984-0578

Robert C. Shinn, Jr.
Commissioner

HPO-B96-46

February 9, 1996

Ms. Susan M. Cange, Site Manager
Former Sites Restoration Division
Department of Energy
Oak Ridge Operations
P.O. Box 2001
Oak Ridge, Tennessee 37831-8723

Dear Ms. Cange:

As Deputy State Historic Preservation Officer for New Jersey, in accordance with 36 C.F.R. Part 800: Protection of Historic Properties, as published in the Federal Register, 2 September 1986 (Volume 51, Number 169, pages 311115-31125), I am commenting officially upon the project designated below.

I am providing final Section 106 comments regarding the following project:

PROJECT TITLE: Bergen County, New Jersey
Maywood Borough [+Lodi Borough & Rochelle Park Township]
Maywood Chemical Works- Maywood Interim Storage + Vicinity
Feasibility Study-Environmental Impact Statement
Formerly Utilized Sites Remedial Action Program

FEDERAL AGENCY: U. S. Department of Energy

I. 800.4 Identifying Historic Properties

I concur with your submitted report, "Stage IA Archaeological Study and Stage II Historical Study of the Maywood Site," Science Applications International Corporation, July 1995, that the Maywood Chemical Company Historic District (14 buildings) is eligible for the National

Register of Historic Places. As per Science Applications' October 10, 1995 memo, Building 76 is of value for its potential contribution to historical research; not connected to a specific chemical manufacturing process, it is representative of ironclad buildings on the site.

While I concur with EPA's concerns about the Stage IA archaeological survey (EPA's May 26, 1994 letter to you), given the level of disturbance at the site, the only moderate potential for archaeological sites, and the amount of time that has passed since our last comments, I accept your conclusions that no intact archaeological deposits [of significance] are likely to exist at the site and that no further archaeological work is needed.

II. 800.5 Assessing Effects

The project, which includes the demolition of Building 76, would have no adverse effect in accordance with 800.9(c)(1), if the building is documented with 5X7 black and white photographs (as suggested in your April 21, 1994 to us) and the final report is revised to include a clear map showing the boundaries of the eligible historic district (standard professional practice). Please submit a final report, including the photographs of Building 76, printed on bond paper, in a hard-cover binder, and with original photographs. (I have attached the HPO's report guidelines for future reference.)

III. Additional Comments

I apologize for the delay in responding to your November 8, 1995 letter. If you have any questions please call Terry Pfoutz, Supervising Historic Preservation Specialist, regarding architecture or Mike Gregg regarding archaeology, at (609) 984-0140.

Thank you.

Sincerely yours,

Dorothy P. Guzzo
Deputy State Historic
Preservation Officer

DPG:vp

Code#96-343(94-1030)TP/MG
Disk#12A:B96-46

State of New Jersey

Christine Todd Whitman
Governor

Department of Environmental Protection

Robert C. Shinn, Jr.
Commissioner

DIVISION OF PARKS AND FORESTRY
HISTORIC PRESERVATION OFFICE
CN-404
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GUIDELINES FOR PREPARING CULTURAL RESOURCES MANAGEMENT ARCHAEOLOGICAL REPORTS SUBMITTED TO THE HISTORIC PRESERVATION OFFICE DECEMBER 1994

Reports must be submitted as individual documents for accessioning in the Historic Preservation Office (HPO) contract and grant report reference library. This requires providing a copy in a hard-covered binder suitable for shelving and printed on bond paper. The text print must be letter quality, although appendices (e.g., soil logs) may be dot matrix if legible. In addition, an Annotated Bibliography form must be filled out and submitted as a separate sheet with each report.

Title Page

1. Title, including phase of work (IA, IB, II, and/or III), municipality, and county.
2. Author(s), including contributors. If an organization's policy prohibits identification of authors on the title page, this information should be included elsewhere in the report.
3. Organization report is prepared by.
4. Agency and/or client report is submitted to.
5. Contract number, if appropriate.
6. Date of report submission or completion.

Acknowledgments (optional)

Management Summary

1. Project type.
2. Location and size of project area.
3. Review authority.
4. Field methods.
5. Results.
6. Evaluations, impacts, and recommendations.
7. Location where copies of report on file.

Table of Contents

Lists of Figures, Plates, and Tables

Figures, plates, and tables should be incorporated into the text on the page following the citation. They should not be appended. Like the text, **all maps, figures, etc. must be on archivally stable paper.**

1. **The report must contain original photographs.** Photographs should be black and white and a minimum of 3" x 5" in size; 5" x 7" or larger photographs may sometimes be necessary for clarity. Photograph captions for site overviews must include direction or orientation. For larger projects, photograph locations should be keyed to a site map. Photographs of features, etc., must include scale, title board, and orientation. Captions should identify photographer and date of exposure.
2. All maps, including reproductions of historic maps, must include a north arrow, accurate bar scale, delineation of the project area, legend, map title, and year of publication. Reports must include the project area accurately delineated on a U.S.G.S. 7.5' topographic map and a county soils survey map, if available for that area. A map showing the project area in relation to New Jersey's physiographic provinces is recommended.
3. Cross section and profile drawings must include scale, elevation, orientation, soil descriptions, and soil colors (Munsell). Detailed plan view drawings should be keyed to the site map.

Introduction

1. Project purpose and goals, such as a summary of the scope of work, including applicable regulations or permits as known.
2. Project administration and contracting agency.
3. General description, including location, number of person days in the field, and project conditions or constraints.

Background Research

This section will vary in length and scope depending on the level of investigation and should relate directly to the project area and vicinity. For all levels of investigation, the background research must be sufficient to enable evaluating National Register eligibility by providing historic contexts for identified sites. For historic sites, background research should be sufficient to identify associations with significant people and events.

1. Environmental setting, including topography, soils, hydrology, and geology.
2. Summary of paleoenvironment, present climate, and current vegetation.
3. Past and present land uses and current conditions.
4. Overview of prehistoric and historic culture history of project locale, including the surveyed area. "Canned" histories should be avoided. This section should provide contexts for research questions, survey methods, site evaluations, and recommendations for further work.
5. Review of known sites, previous investigations and research in the project area and vicinity, and information provided by local collectors and ASNJ local chapter members. Attached is a list of standard references (e.g., Skinner and Schrabisch 1913; Cross 1941) that must be consulted for all projects.
6. Primary documentary research for the project area, including historic maps, deeds, or other pertinent information. Detailed individual property title searches may be appended.

Research Design

This section is required for all reports and will vary in scope and depth depending on the level and scope of the investigation. It outlines the purpose of investigation, basic assumptions about the location and type of cultural resources within the project area, and the rationale for the methods employed in the investigation.

1. Research objectives and theoretical context, with reference to the HPO historic contexts.
2. Specific research problems or questions.
3. Methods to be employed to address the research objectives and questions.
4. A discussion of the expected results, including hypotheses to be tested.

Methods

1. Description of field and laboratory methods employed, including rationale, discussion of biases, and problems or obstacles encountered. This should include discussion of materials not collected in the field (field sorting) and discarded in the laboratory. Details regarding lab procedures may be presented in artifact appendices.

2. An estimated percentage of total project area investigated, with discussion of sampling design and

rationale. This must include descriptions of shovel test and test excavation unit sizes. **Archivally stable maps showing location of survey and testing must be included in this section.**

3. Discussion of changes made during fieldwork from the stated methods, and the rationale for these changes (e.g., as the result of field conditions).
4. Definition of "site" used in the survey.

Field Results

1. Clear description of all areas investigated, including those where resources were not recovered or observed. This section must include the total number of tests excavated.
2. Summary of soils and stratigraphy, including areas and types of disturbance. A description of the stratigraphy of representative shovel tests should be included as an appendix.
3. The description of each identified site must include topographic setting and stratigraphy, size, noted structures or features, artifact types, and an estimate of artifact density. **References to sites in the text, figure captions, and table titles in the final report must include Smithsonian numbers.**
4. Maps, figures, and photographs of test locations, features, and soil profiles, as appropriate.

Artifact Analysis

A separate analysis chapter may not be necessary, depending on the scope of the investigation and field results. Descriptions of limited quantities of artifacts may be incorporated into the field results with references to the artifact inventory appendix.

1. Artifact descriptions and results of analyses. Definitions of artifact classes and attributes should be provided along with pertinent references.
2. Photographs or drawings of selected or representative artifacts, including scale. A complete inventory of artifacts by provenience and class should be included as an appendix.
4. Tables or other summary information.
5. **Identification of repository for artifact collection and project files.**

Interpretations

1. Discussion of results in terms of the background cultural context, research design, goals, and research problems with reference to the HPO historic contexts.

2. Discussion of constraints and reliability of methods.
3. Discussion of potential research questions based on the results and conclusions.

Evaluation of National Register Eligibility, Project Effects, and Site Recommendations: Phase I and Phase II Reports

This section will vary in length depending on the level of investigation. Documentation must be sufficient to allow the reviewer to make independent evaluations of the New Jersey Register and National Register eligibility of identified properties. This includes sufficient documentation to evaluate significance using the four National Register criteria. A Phase I report should address potential eligibility, rather than a full evaluation. Recommendations that a site is not eligible must be fully documented as described below. A Phase II report must contain a full evaluation and include adequate information on both horizontal and vertical extent of the site.

1. Evaluation of each site in terms of known information and research potential, within the context of current broad questions in anthropological and historical theory. The eligibility of each site should be assessed for listing in the New Jersey and National Registers of Historic Places, using the National Register criteria for evaluation. The factors considered in making the assessment need to be fully described. The eligibility of each property must be evaluated within the HPO historic context framework. Significance statements must be fully developed with reference to historic contexts.
2. Description of both direct and indirect impacts from the project on each site identified. This should include depicting identified sites on project maps, if available.
3. Depending on the level of investigation, appropriate recommendations for each site, including no further work, additional investigations, data recovery, or avoidance. Other specific recommendations may also be appropriate, e.g., special analyses that should be undertaken if there is additional work at the site.

Sources

All sources may be listed together.

1. References cited and consulted (American Antiquity format).
2. Maps.
3. Archival documentation.

4. Personal communications from informants, including oral histories.
5. Pertinent project correspondence.

Appendices

1. Qualifications of Principal Investigator, Field Director, and Laboratory Supervisor, if applicable.
2. Scope-of-Work.
3. Representative soils logs.
4. Artifact inventory by provenience.
5. Specialized analyses and deed research, if appl.
6. Site forms for all recorded sites.

STANDARD REFERENCES TO BE CONSULTED

Bello, Charles A. (compiler and editor)
1986 Index, Bulletin No. 1, 1948 through Bulletin No. 40, 1986. **Bulletin of the Archaeological Society of New Jersey** No. 41:1-27.

1990 Index, Bulletin No. 41, 1986 through Bulletin No. 45, 1990. **Bulletin of the Archaeological Society of New Jersey** No. 45:96-110.

Chesler, Olga (editor)
1982 **The Paleo-Indian Period to the Present: A Review of Research Problems and Survey Priorities.** New Jersey Department of Environmental Protection, Division of Parks and Forestry, Office of New Jersey Heritage, Trenton.

1984 **Historic Preservation Planning in New Jersey: Selected Papers on the Identification, Evaluation, and Protection of Cultural Resources.** New Jersey Department of Environmental Protection, Division of Parks and Forestry, Office of New Jersey Heritage, Trenton.

Cross, Dorothy
1941 **Archaeology of New Jersey, vol. I.** Archaeological Society of New Jersey and New Jersey State Museum, Trenton.

New Jersey Department of Environmental Protection
1979-1985 **Annotated Bibliography: Cultural Resource Survey Reports Submitted to the New Jersey State Historic Preservation Officer.** 5 vols. Division of Parks and Forestry, Office of New Jersey Heritage, Trenton. Reports submitted since 1985 are available for review at the HPO.

1990 **New Jersey and National Registers of Historic Places as of December 31, 1988.** Division of Parks and Forestry, Office of New Jersey Heritage, Trenton.

1994 **New Jersey & National Register of Historic Places, 1989-1992 Addendum.** Division of Parks and Forestry, Historic Preservation Office, Trenton.

New Jersey Pinelands Commission
1980 **New Jersey Pinelands Comprehensive Management Plan.** New Lisbon NJ.

1991 **Pinelands Cultural Resource Management Plan for Historic Period Sties.** New Lisbon NJ.

Schrabisch, Max
1915 **Indian Habitations in Sussex County, New Jersey.** Bulletin No. 13. Geological Survey of New Jersey, Union Hill.

1917 **Archaeology of Warren and Hunterdon Counties.** Bulletin No. 18 (Geologic Series). Reports of the Department of Conservation and Development, Trenton.

Skinner, Alanson and Max Schrabisch
1913 **A Preliminary Report of the Archaeological Survey of the State of New Jersey.** Bulletin No. 9. Geological Survey of New Jersey, Trenton.

Spier, Leslie
1915 **Indian Remains near Plainfield, Union Co., and along the Lower Delaware Valley.** Bulletin No. 13. Geological Survey of New Jersey, Union Hill.

An up-to-date listing of New Jersey and National Register properties is available for review at the HPO. Also available for study at the HPO are New Jersey Historic Sites Inventory records and Historic Preservation Fund Survey and Planning Grant reports. County historic site surveys are available for review at the HPO and local government offices.

Selected Criteria Used In Review of Archaeological Reports

1. Is the Annotated Bibliography form attached?
2. Is the project information (e.g. agencies, regulatory citations, project boundaries) accurate and complete?
3. Is the environmental and background information adequate? Are previous investigations in the area described?
4. Is the research design clearly stated and related to the HPO historic contexts?
5. Is the fieldwork clearly presented? Are all investigated areas clearly identified, described in the text, and illustrated on maps? Are all identified sites clearly and adequately described and mapped?
6. Are artifacts and features described, illustrated, and analyzed? Is the artifact inventory appended? Is the artifact repository identified?

7. Do site interpretations refer to the background context, stated research design, and HPO historic contexts?

8. Are the integrity and significance of each site fully explored and justified? Are both primary and secondary impacts of the project fully assessed for each resource? Do the recommendations take into account the evaluations of eligibility and the full range of project impacts?

9. Are maps, photos, tables, and figures clearly presented, and do they contain all appropriate information?

10. Are references complete?

11. Are the appropriate appendices contained within the body of the report, including site forms, soil logs, artifact inventories, and resumes?

12. Is the report, including all maps and figures, on archivally stable paper and securely bound?

HISTORIC PRESERVATION OFFICE
BIBLIOGRAPHIC ABSTRACT INFORMATION

Author(s):

Report Title:

Location:
(County and Municipality)

Drainage Basin:

USGS Quadrangle:

Project:
(Agency, type of review, and brief project description)

Level of Survey:

Cultural Resources Identified:

NEW JERSEY HISTORIC PRESERVATION OFFICE, HISTORIC CONTEXTS

Under the National Historic Preservation Act, each State Historic Preservation Office is responsible for preparing and implementing a "comprehensive statewide historic preservation plan." A State Historic Preservation Plan is a concise document that describes a vision for historic preservation in the state as a whole and sets future direction for the State Historic Preservation Office. It provides direction and guidance for decision-making by addressing, at a general level, the state's full range of historic resources including objects, buildings, structures, districts, and archaeological sites. Information on historic resources used to develop and update the State Historic Preservation Plan is derived from a variety of sources including historic context documents, theme studies, resource inventories, and National Register nominations. Historic context documents are emphasized in developing and revising a State Plan.

As of December 1994, the New Jersey State Historic Preservation Office (HPO) is in the process of drafting its State Plan. However, a reference file of historic context documents has already been developed. Historic contexts enable considerations of historic properties in terms of chronological timeframes, cultural themes (or topics), and geographic areas. The historic context files in the HPO are organized mainly by chronological categories and cultural themes. The following chronological categories were proposed in 1988 and have been utilized quite consistently over the past six years:

1.	Paleo-Indian	11,500-8000 years ago
2.	Early Archaic	10,000-6000 years ago
3.	Late Archaic	6000-3000 years ago
4.	Early/Middle Woodland	3000-1200 years ago
5.	Late Woodland	1200 years ago-A.D. 1801
6.	European Intrusion	A.D. 1500-1700
7.	Initial Colonial Settlement	A.D. 1630-1775
8.	Early Industrialization, Urbanization, and Agricultural Development	A.D. 1750-1860
9.	Suburban Development	A.D. 1840-1940

10.	Immigration and Agricultural, Industrial, Commercial, and Urban Expansion	A.D. 1850-1920
11.	Metropolitan New Jersey	A.D. 1910-1945
12.	Modern New Jersey	A.D. 1945-present

The sections of the historic context files dealing with cultural themes or topics identify a variety of subjects. Examples include Afro-Americans in New Jersey, Maritime New Jersey, Military History, and Transportation. These and all other historic context files are open for updating and expansion. New topics can be added as needed.

The third aspect of historic contexts is spatial or geographic variation. Therefore, the historic context files also contain information regarding human use of New Jersey by geographic area. Considerations of geographic variations are found primarily within individual sections of the files dealing with specific time periods and themes/topics.

Preparers of archaeological reports are urged to become familiar with the historic context files. Ideally, these files should contain, or provide reference to, current information upon which a great deal of HPO planning and decision-making is based. Of particular concern to archaeological report writers, this decision-making includes evaluations of National Register eligibility for prehistoric and historic archaeological sites.

DRF/MLG:C:\WD\REPORTS

- ___ Historic Preservation Planning in New Jersey: Selected Papers on the Identification, Evaluation and Protection of Cultural Resources
- ___ New Jersey's Archeological Resources from the Paleo-Indian Period to the Present: A Review of Research Problems and Survey Priorities
- ___ How to Research the History of a House
- ___ Historic Preservation Fund Survey & Planning Grant Activities in New Jersey 1975-1991.
- ___ New Jersey Historic Preservation Commissions Directory
- ___ Municipal Land Use Law, New Jersey Statues Annotated, Historic Preservation Related Sections
- ___ New Jersey Register of Historic Places Act, New Jersey Laws of 1970, Chapter 268 and Regulations for Project Authorization
- Local Preservation:

___ "Historic Preservation" and "Historic Properties"
___ What Are The National Register Criteria?
___ What Is The National Historic Preservation Act?
___ Q and A About Historic Properties Survey
___ What is "Section 106 Review?"
___ When Preservation Commissions Go To Court
___ Subdivision Regulation and Historic Preservation
___ Choosing an Archeological Consultant
___ Is There Archeology In Your Community?
___ What Are The Historic Preservation Tax Incentives?
___ Q and A About the "SHPO"
___ Local Preservation: A Selected Bibliography
___ Zoning and Historic Preservation

- ___ Historic Preservation Law: A New Hybrid Statute with New Legal Problems
- ___ A Five-Minute Look at Section 106

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