



## APPENDIX 1

### ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE (RFETS) PRIMER

#### ROCKY FLATS AS PART OF THE DEPARTMENT OF ENERGY NUCLEAR WEAPONS COMPLEX

Rocky Flats Environmental Technology Site (RFETS) is part of the United States Department of Energy's Nuclear Weapons Complex. The complex consists of 13 interrelated major facilities that have (or had) as their main mission the design, manufacture, testing, and maintenance of nuclear weapons for the U.S. arsenal.

The weapons complex has three types of facilities: (1) nuclear sites, (2) non-nuclear sites, and (3) laboratories and test sites. Nuclear sites fabricated parts and assembled weapons using radioactive and non-radioactive materials. Non-nuclear sites manufactured technologically sophisticated parts for non-nuclear components of nuclear weapons. The laboratories and test sites were responsible for the research, development, and testing that supported the U.S. weapons program.

With the end of the Cold War, thousands of DOE facilities that are contaminated with radioactivity have become surplus. Many of the sites contain large and intricate production facilities that are contaminated with a combination of chemical and radiological hazards. Contamination of soil, surface, and groundwater is extensive. It has been estimated that it will cost close to \$300 billion to clean up the DOE weapons complex, and this clean-up will be the single largest environmental program in history.

#### ROCKY FLATS SITE OVERVIEW

RFETS occupies an area of approximately 6,450 acres in northern Jefferson County, Colorado, approximately 15 miles northwest of Denver. From its first construction in the early 1950s, the original 2,520-acre site developed into an industrial complex consisting of more than 425 facilities that were used as manufacturing, chemical processing, laboratory, support, research and development, and administrative facilities. The site's main production and support facilities were located near the center of the site, which occupies about 385 acres. In 1972 a surrounding 3,930-acre parcel was acquired to function as a security and safety "Buffer Zone" to "minimize problems arising from the proximity of an industrial facility to a residential community."<sup>5</sup> (*U.S. Atomic Energy Commission. Environmental Statement, Land Acquisition, Rocky Flats Site, Colorado WASH-1518. April 1972*).

Land adjacent to the Buffer Zone is still used primarily for agricultural and mining purposes. In the 40 years since Rocky Flats was constructed, surrounding multi-use development has approached the site and the population of the Denver metropolitan area has increased to the point at which approximately 2.2 million people live within a 50-mile radius of the site.

From 1952 to 1989, the primary mission of the site (then called the Rocky Flats Plant) was the production of nuclear and non-nuclear components for nuclear weapons. During this time, activities generally consisted of radioactive (e.g., plutonium, uranium, etc.) and nonradioactive (e.g., stainless steel, beryllium, etc.) metal-working, fabrication and component assembly, and plutonium recovery and purification. Research and development in the fields of chemistry, physics, metallurgy, materials technology, nuclear safety and mechanical engineering were conducted to advance the site's mission.

In 1989, almost all of the Site's radioactive material production activities were suspended due to safety and environmental concerns related to site operations. Additionally in 1989, the site was placed on the Superfund National Priorities List. In 1992, when the production of the W-88 Trident Warhead was canceled, the nuclear weapons production role of Rocky Flats ended. Although production has ceased, many buildings store nuclear weapons components, other nuclear materials, and wastes. Extensive effort and manpower are required to maintain the facilities in a safe and secure condition.

In 1991, the DOE entered into a tri-party Rocky Flats cleanup agreement (called the "Interagency Agreement") with both the State of Colorado and the U.S. Environmental Protection Agency. The Agreement specifies a legally enforceable framework for assessing the nature and extent of contamination, determining the associated risks, and accomplishing remediation. Currently, 173 Individual Hazardous Substance Sites (IHSSs) have been identified at the site grouped into 16 Operable Units.

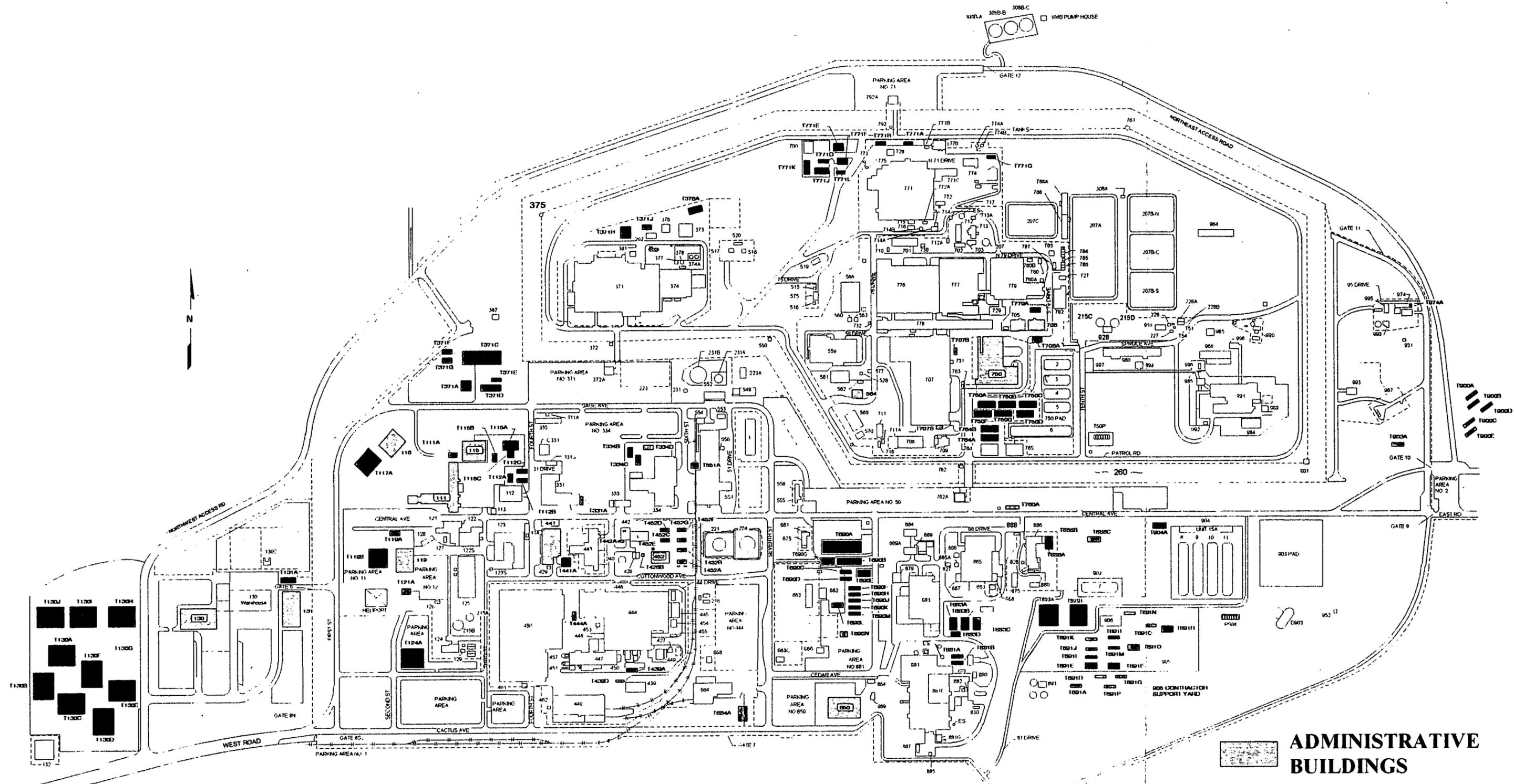
The exhibits listed below, which follow this text, help describe Rocky Flats.

- EXHIBIT 1 - Current Material Inventories at Rocky Flats
- EXHIBIT 2 - Map of the Plutonium Facilities
- EXHIBIT 3 - Map of the Administrative Facilities
- EXHIBIT 4 - Map of Infrastructure Facilities
- EXHIBIT 5 - Map of Individual Hazardous Substance Sites
- EXHIBIT 6 - Map of Current Waste Management Facilities

EXHIBIT 1

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE CURRENT MATERIAL  
INVENTORIES

<u>Material Type</u>	<u>Quantities</u>
Sanitary Waste	N/A
Hazardous Waste	385 m <sup>3</sup>
Low-Level Waste	5,472 m <sup>3</sup>
Low-Level Mixed Waste	14,820 m <sup>3</sup>
Transuranic Waste	584 m <sup>3</sup>
Transuranic Mixed Waste	586 m <sup>3</sup>
Soil & Water Contamination	300,000 m <sup>3</sup> (soil) 53 mil. gal. (5 mil. gal. may need treatment)
Pu Solutions	143 Kg Pu (30,000 liters)
Pu Residues	~3,100 Kg Pu (100,000 Kg bulk material)
Pu Oxide	~3,200 Kg Pu
Pu Metal	~6,600 Kg Pu
Enriched Uranium	~6,700 Kg U
Highly Enriched Uranium solution	569 Kg U



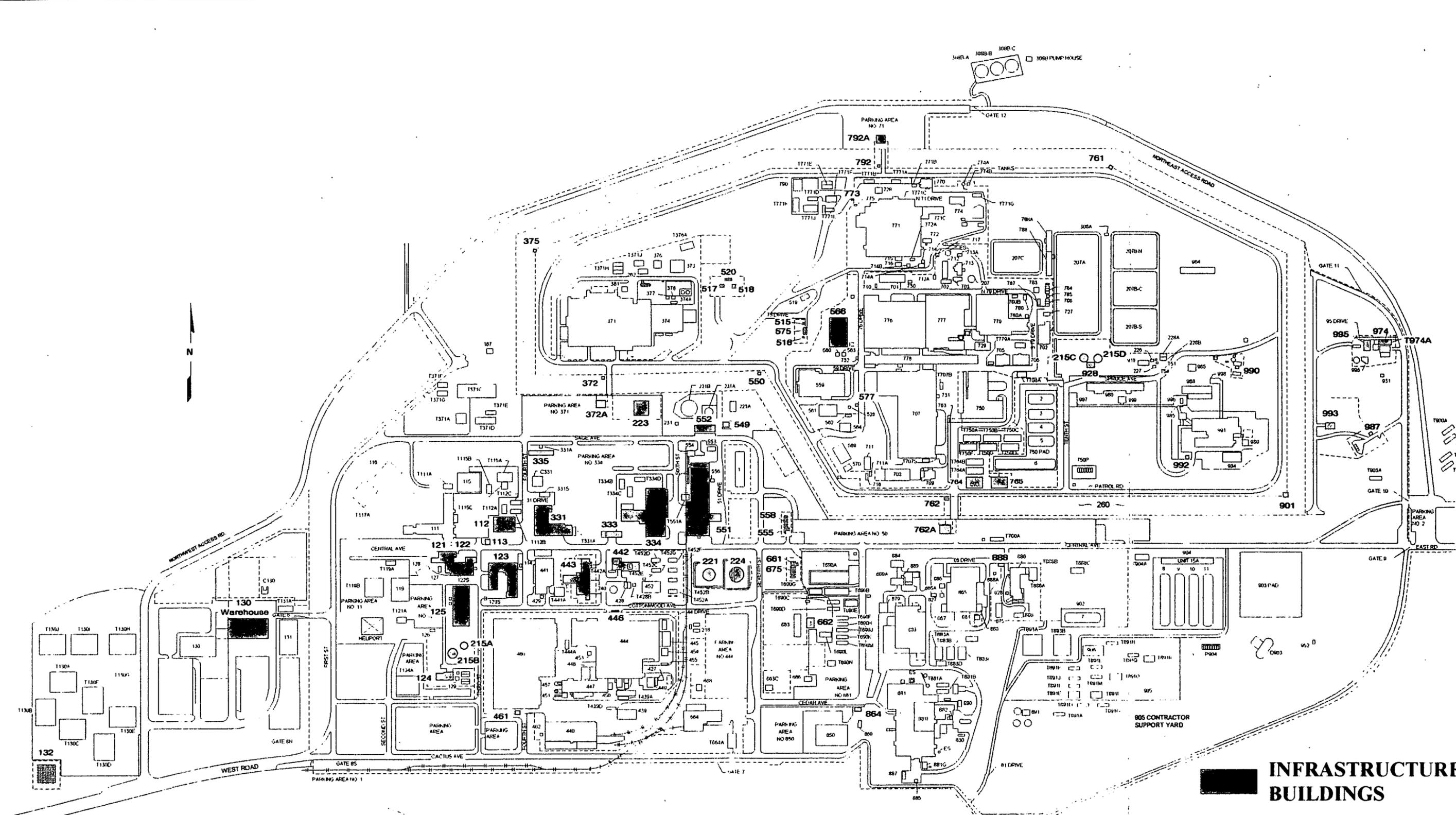
 ADMINISTRATIVE BUILDINGS

 TRAILERS

*Revision 1*

09/20/85

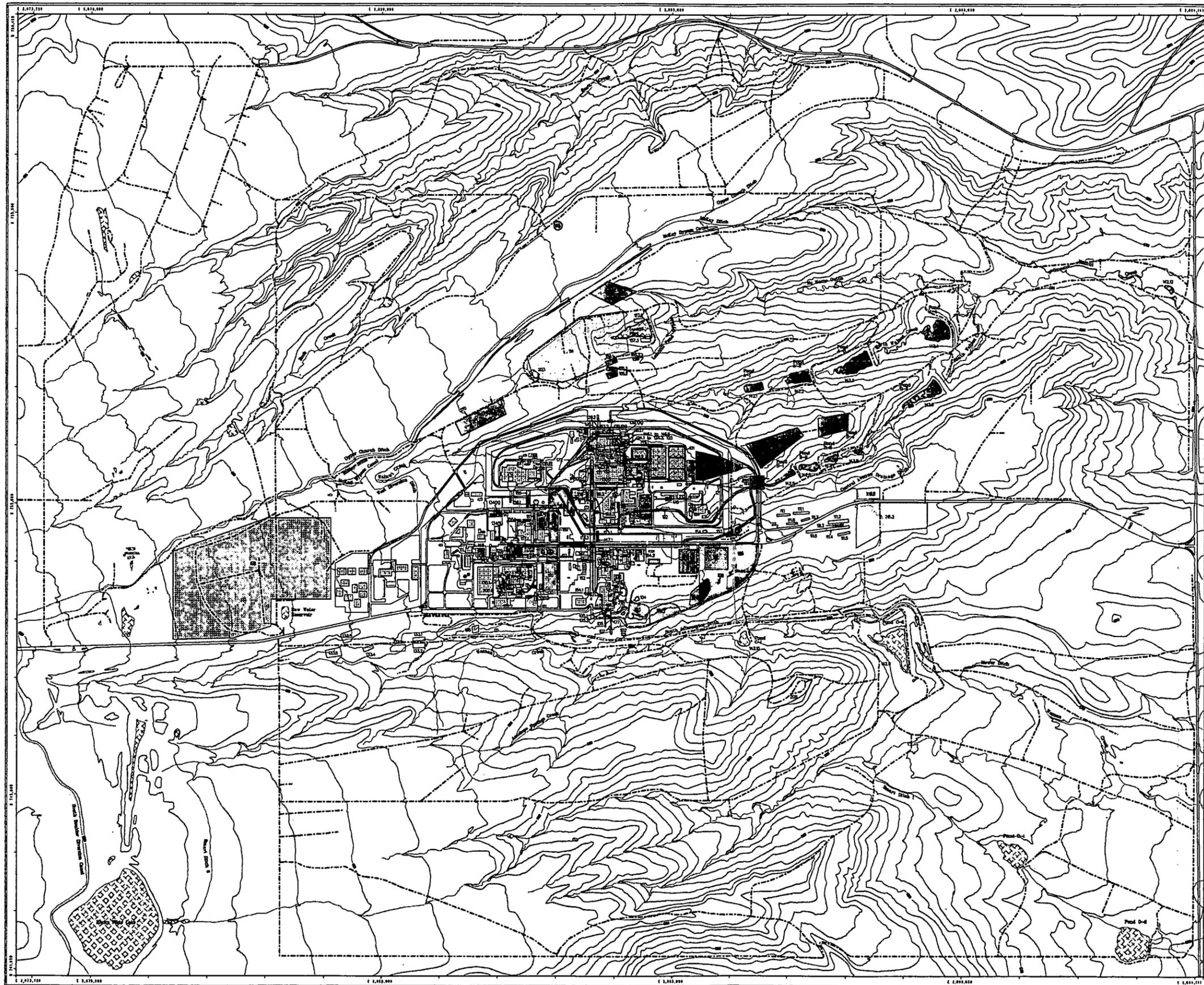
# ADMINISTRATIVE BUILDINGS



 **INFRASTRUCTURE BUILDINGS**  
 **SUB-STATIONS**

**Revision 1**  
 09/20/85

# INFRASTRUCTURE SYSTEMS FACILITIES MAP



### Individual Hazardous Substance Sites by Operable Unit

- Operable Unit 1
- Operable Unit 2
- Operable Unit 4
- Operable Unit 5
- Operable Unit 6
- Operable Unit 7
- Operable Unit 8
- Operable Unit 9
- Operable Unit 10
- Operable Unit 11
- Operable Unit 12
- Operable Unit 13
- Operable Unit 14
- Operable Unit 15
- Operable Unit 16
- Operable Unit 17
- Operable Unit 18

### Standard Map Features

- Buildings or other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Contours (20' intervals)
- Paved roads
- Dirt roads

**DATA SOURCE:**  
 Building, roads, and fences provided by  
 Esri, Inc.  
 ESRI, Inc. - 1997.  
 Hydrology provided by  
 USGS - (date unknown)  
 Individual Hazardous Substance Sites (IHSS) are  
 delineated by the following:  
 OUS - 1998 Phase II Report  
 OUS, 4, 7, 11, & 15 - 1999  
 The remaining OUs are defined by their  
 respective Operable Unit Workplans.

Scale = 1 : 21820  
 1 inch represents approximately 1777.5 feet



State Plane Coordinate Projection  
 Colorado Central Zone  
 Datum: NAD27  
**Figure 1**

U.S. Department of Energy  
 Rocky Flats Environmental Technology Site

Prepared by:  
**Rocky Mountain Remediation Services, L.L.C.**  
 Geographic Information Systems Group  
 Rocky Flats Environmental Technology Site  
 P.O. Box 464  
 Golden, CO 80402-0464

MAP ID: oushd October 10, 2008

# Plutonium Facilities Map

EXHIBIT 2

## EXPLANATION

■ Plutonium  
Facilities

▨ Buildings and  
other structures

- - Fences

- - Paved roads

- - - Dirt roads

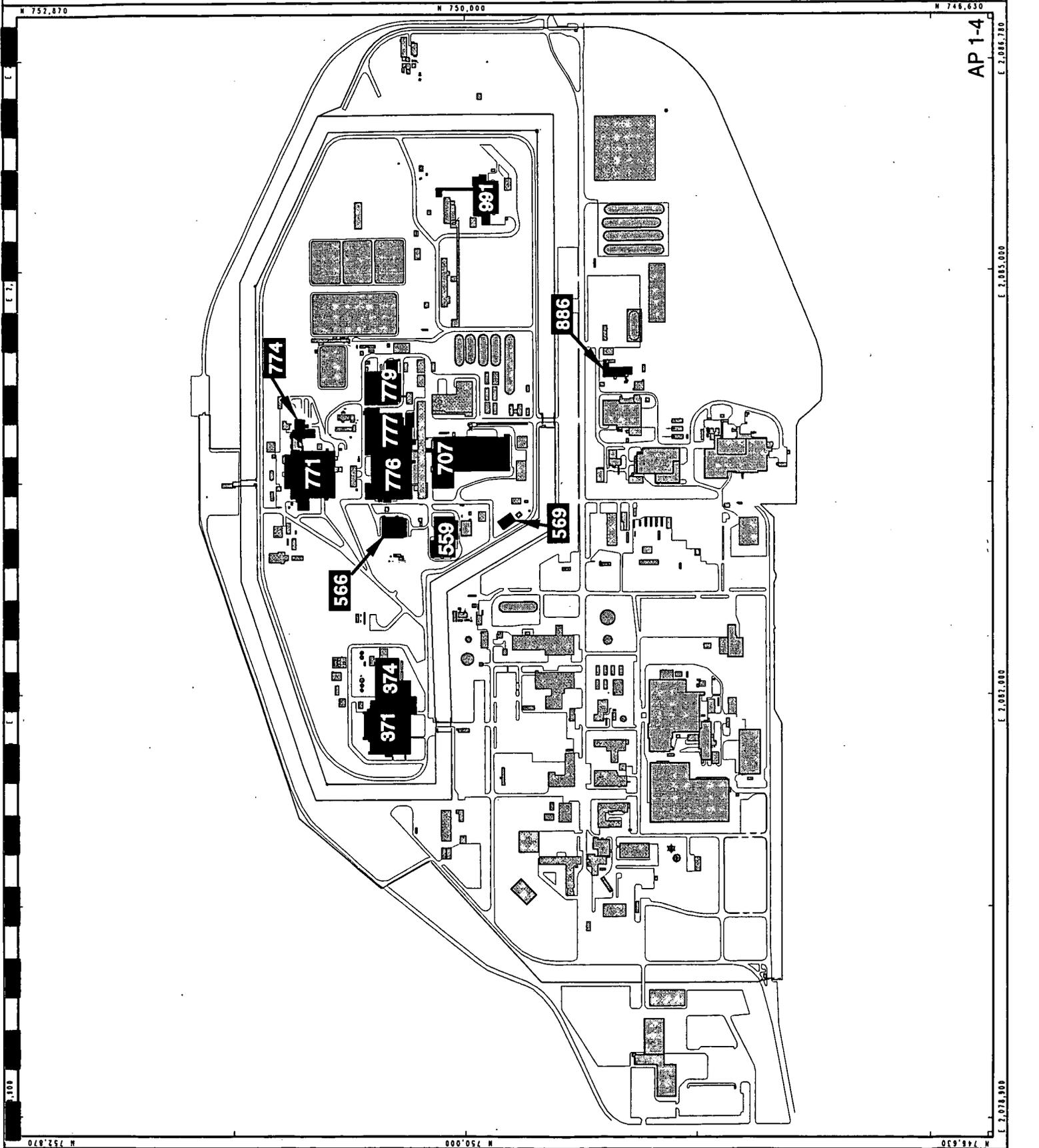
### DATA SOURCE:

Buildings, roads, and fences  
provided by Facilities Engr.  
EG&G Rocky Flats, Inc. - 1991.  
Hydrology provided by  
USGS - (date unknown)



Scale = 1 : 7,600  
1 inch represents approximately 110.88 feet  
Bates Plane Coordinate Projection  
Datum: NAD27

U.S. Department of Energy  
Rocky Flats Environmental Technology Site  
Kaiser Hill Planning and Integration  
Systems Analysis Group  
Golden CO 80204  
October, 1995  
MAP ID: DR8



AP 1-4

N 748,630 N 750,000 N 752,870 E 2,018,500 E 2,085,000 E 2,086,780





## APPENDIX 2

### GLOSSARY

This glossary contains a compilation of acronyms and abbreviations used in the ASAP draft. This is by no means a complete listing of all terms and assumes the reader has a basic knowledge of radioactivity, chemical hazards, environmental regulations, and the Rocky Flats mission elements. Terms and definitions used were derived primarily from the source documents listed below and they may be consulted if a more complete glossary is desired.

- Rocky Flats Dictionary (Abbreviations, Acronyms, and Initialisms used at Rocky Flats)
- Rocky Flats Dictionary (EG&G Rocky Flats Plant Definitions)
- Conceptual Project Plan for A Path Forward, Version 5.0, 3/29/95

#### SELECTED ACRONYMS AND ABBREVIATIONS

ALARA	As Low As Reasonably Achievable
ARAR	Applicable or Relevant and Appropriate Requirement
ASAP	Accelerated Site Action Project
B/A	Budget Authority
BEMR	Baseline Environmental Management Report
CDPHE	Colorado Department of Public Health and Environment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
D4	Deactivation, decontamination, decommissioning, and dismantlement
D&D	Deactivation and decontamination
DNFSB	Defense Nuclear Facilities Safety Board
DOE	United States Department of Energy
DOE/EM	Department of Energy, Office of Environmental Restoration and Waste Management
DOE/HQ	Department of Energy Headquarters
DOE/RFFO	Department of Energy, Rocky Flats Field Office
EPA	United States Environmental Protection Agency
ES&H	Environment, Safety, and Health
eU	enriched uranium
FTE	Full-Time Equivalents
g/l	grams per liter
HEPA	High Efficiency Particulate Air

HEU	Highly Enriched Uranium
HEUN	Highly Enriched Uranyl Nitrate
IA	Industrial Area
IAEA	International Atomic Energy Agency
IAG	Interagency Agreement
IHSS	Individual Hazardous Substance Site
Kg	Kilogram
LDPE	Low density polyethylene
LDR	Land Disposal Restrictions
LEU	Low Enrichment Uranium
LLW	Low Level Waste
LLMW	Low Level Mixed Waste (also LLM)
LOI	Loss on Ignition
m <sup>3</sup>	Cubic meters
MSE	Molten Salt Extraction
NA	No Action
NFA	No Further Action
nCi	Nanocurie (One trillionth of a Curie)
NTS	Nevada Test Site
O&M	Operations and Maintenance
OU	Operable Unit
PA	Protected Area
PAC	Potential Area of Concern
PCB	Polychlorinated Biphenyls
pCi	Picocurie (One billionth of a Curie)
PIC	Potential Incident of Concern
PRG	Preliminary Remediation Goals
Pu	Plutonium
RCRA	Resource Conservation and Recovery Act
RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site (also Site)
RTR	Real-Time Radiography
S&M	Surveillance and Maintenance
SNM	Special Nuclear Material
SST	Safe Secure Transport
SWEIS	Sitewide Environmental Impact Statement
TBD	To Be Determined
TRU	Transuranic waste
TRUM	Transuranic Mixed waste

TSCA	Toxic Substances Control Act
UBC	Under Building Contamination
VOC	Volatile Organic Compound
WAC	Waste Acceptance Criteria
WIPP	Waste Isolation Pilot Plant

**As Low As Reasonably Achievable (ALARA)** - An approach to radiation exposure control to maintain exposure, both individual and collective, to the work force and the general public, as far below the limits as the specific technical, economic, and practical considerations permit.

**Assessment** - Evaluation, often quantitative, of the actual condition of a facility against the requirements established for the facility. Assessments may focus on regulations for protection of the environment, protection of human health (both on-site workers and other potentially exposed populations), and others. Assessments are often associated with characterization efforts, but represent judgments and evaluations applied to facility conditions versus the mere compilation of such data.

**Authorization Basis** - The combination of technical, management, and performance standards, which when applied and implemented in concert with one another for all of the hazardous processes or activities within a facility, allows the hazardous processes or activities to be performed with consequences that are acceptable, for normal and reasonably expected abnormal events.

**Base activities (also Baseline or Mortgage)** - Those activities essential to maintain the minimal acceptable level of environmental, risk, health, and safety compliance requirements within facilities, Site utilities, and Site areas.

**Calcination** - A process which uses furnaces to heat residue feed to a high temperature (typically 500-1000° C, but well below the melting point) in the presence of oxygen to stabilize the material by causing oxidation and loss of moisture.

**Characterization** - (1.) As applied to a facility or site: Sampling, survey, monitoring, and sample or data analysis activities to determine the nature, level, and extent of radioactive or other hazardous contamination. Characterization is the collection or compilation of measurable data to provide necessary technical information for the development, screening, analysis, and selection of appropriate cleanup techniques. (2.) As applied to individual containers or samples: Analysis (quantitative or qualitative) and description of the essential characteristics or constituents of a material, usually a waste.

**Cleanup or Remediation** - Any actions (including decontamination and removal - defined separately) taken to reduce health or environmental hazards associated with the presence of hazardous or radioactive wastes at a DOE facility. The closely allied terms, "remedial action" and "remedy," are used in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Section 101(24), to denote relatively permanent corrective actions taken to mitigate the effects of a release of hazardous materials, and in the context of CERCLA, are distinguished from removal actions, which are more near-term, often temporary measures.

**Closure** - Completion of removal or remedial actions required under CERCLA, together with testing, sampling, or verification of the cleanup site. Closure may also require establishment of post-closure monitoring of the remediated area. The specific requirements for closure of a site subject to CERCLA will be detailed in a closure plan which is approved by the appropriate regulatory agencies. Also, under the Resource Conservation and Recovery Act (RCRA), the act of securing a hazardous waste management facility pursuant to 40 CFR Part 264 requirements.

**Compliance Agreements (also Regulatory Agreements)** - Legally binding agreements between regulators and regulated entities that set standards and schedules for compliance with environmental statutes. Includes Consent Order and Compliance Agreements, and Federal Facility Compliance Agreements.

**Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)** - federal statute (also known as Superfund), enacted in 1980 and reauthorized in 1986, that provides the statutory authority for cleanup of hazardous substances that could endanger public health, welfare, or the environment.

**Contamination** - Unwanted radioactive or other hazardous material which is dispersed (often in particulate form) on or in equipment, structures, objects, personnel, soil, water, or air. Contamination may be either surface or volumetric (i.e., neutron-induced radioactivity within a solid material); surface contamination may be either removable or fixed.

**Deactivation** - The process and activities associated with placing a facility in a safe shutdown condition. Includes removal of Special Nuclear Material inventories.

**Decommissioning** - (1.) The process of safely removing from operation a DOE facility contaminated or formerly contaminated with radioactive or other hazardous material so as to provide adequate protection from radiation and hazardous material exposure and to reduce the likelihood of contaminant migration into soil, water, or air. (2.) Includes any and all actions taken to stabilize, reduce, or remove radioactive and/or hazardous contamination or actions to refurbish or to demolish the facilities (D4 when used in this context).

**Decontamination** - The process of reducing the level or removing radioactive or hazardous materials contamination from facilities, equipment, or soils by washing, heating, mechanical cleaning, chemical or electrochemical action, or other techniques. Decontamination may be a component of decommissioning used to prepare a facility for refurbishment or demolition, dismantlement, or entombment. Decontamination may be complete or partial based on an evaluation of the relative benefit of the effort to reduce risk and the follow-on decommissions tasks anticipated.

**Defense Nuclear Facilities Safety Board (DNFSB)** - An independent federal commission tasked with overseeing the safety of operations at all defense-related nuclear facilities, including those involved in weapons production and those undergoing dispositioning. The board reports directly to Congress and the President, and for DOE facilities, submits recommendations for action to the Secretary of Energy.

**Demolition** - Actions undertaken to tear down or raze an unneeded structure. Demolition efforts (usually involving explosives, wrecking balls, and similar techniques) are not generally conducive to minimizing the spread of contamination and therefore must be used with care for heavily contaminated facilities.

**Dismantlement** - Actions undertaken to completely or substantially remove a contaminated facility by controlled disassembly. As contrasted with demolition, dismantlement is generally accomplished in a more controlled manner so as to minimize the spread of contamination and to facilitate the removal and disposal of contaminated components.

**Disposal** - Emplacement of waste in a manner that assures isolation from the biosphere for the foreseeable future with no intent of retrieval and that requires deliberate action to regain access to the waste. This term also has a specific meaning under the Resource Conservation and Recovery Act (RCRA), which defines a "disposal facility" as one where hazardous waste (as defined under RCRA) is intentionally placed on or into land or water, and where such waste will remain after closure.

**DOE Orders** - Internal requirements that establish DOE policy and procedures for compliance with applicable statutes and regulations.

**DOE-STD-3013-94** - Criteria for Safe Storage of Plutonium Metals and Oxides. Criteria for safe storage of plutonium metals and plutonium oxides, greater than 50% plutonium by weight, for at least 50 years at DOE facilities. The criteria include the following: thermal stabilization of oxide to less than 0.5% loss on ignition (LOI); metal or oxide sealed in inert atmosphere in a material

container; material container sealed in a boundary container; boundary container sealed in a primary containment vessel; periodic surveillance of the filled containers.

**Effluent** - A gaseous or liquid waste stream released to the environment from a facility. An outflow or discharge of waste, as from a sewer.

**Entombment** - Sealing or burying a radioactively contaminated facility or other radioactive material within a strong and structurally long-lived material (e.g., concrete or clay soils) to provide long-term control of the material. Because of land disposal restrictions implemented under the Resource Conservation and Recovery Act, this form of disposal is generally not applicable to nonradioactive hazardous material. Entombment is essentially equivalent to the Nuclear Regulatory Commission term ENTOMB.

**Environmental Assessment** - A National Environmental Policy Act (NEPA) document prepared to appraise the effect of a proposed project on the aggregate social and physical conditions that influence a community or ecosystem. EA helps determine if an EIS is required.

**Environmental Impact Statement** - A NEPA document prepared by a federal agency on the environmental impact of its proposals for legislation and other major actions significantly affecting the quality of the human environment.

**Environmental Restoration** - Cleanup and restoration of sites contaminated with hazardous substances during past production or disposal activities.

**Facility** - A building, plant, storage building, laboratory, or other structure that fulfills a specific purpose and is owned by or otherwise under the responsibility of the DOE. Examples include enclosed or covered storage areas, production or processing plants, radioactive waste disposal structures, testing or research laboratories, and accommodations for analytical examinations of irradiated and unirradiated materials or components. This term also has a specific meaning under the Comprehensive Environmental Response, Compensation, and Liability Act that is much broader than the above and can include ponds, ditches, vehicles, and other places where hazardous substances may be located.

**Future Site Use** - Activities or potential activities taking place on a DOE site at a later time after specified dispositioning efforts have been completed. Unrestricted, restricted, and exclusionary use are all categories of future site uses; these may be further subdivided into more specific types of land or facility usage (e.g., farmland, public recreation, industrial). Future site use will in part govern the cleanup standards and techniques employed at a contaminated site and must be determined with appropriate input from regulatory agencies, the public, and other stakeholders.

**Glovebox** - (1.) An enclosure having openings fitted with gas-tight gloves by means of which certain radioactive or other special materials may be safely handled. (2.) Containment structure for handling radioactive materials, which is fitted with gloves and windows and is maintained under negative pressure.

**Ground water** - Water that fills the spaces between soil, sand, rock, and gravel particles beneath the earth's surface. Rain that does not immediately flow to streams and rivers slowly percolates down through the soil and rock to a point of saturation to form ground water reservoirs. Ground water flows at a very slow rate, compared to surface water, along gradients that often lead to river systems.

**Hazardous Material** - A substance determined by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported, and which is designated as such in Code of Federal Regulations, Title 49, Section 172.101, or the appendix to 172.101.

**Hazardous Waste** - A substance having one or more of the characteristics of ignitability, corrosivity, reactivity, or toxicity, or listed by the Colorado Department of Health as a hazardous waste in 6 CCR 1007-3, Part 261.

**Individual Hazardous Substance Site (IHSS)** - A specific location where contaminants, either radioactive or hazardous, have been released or suspected of being released to the environment. All IHSSs require characterization and a Record of Decision for sites such as Rocky Flats which are listed as a Superfund site on the National Priorities List.

**Land Disposal Restrictions (LDR)** - Provisions of the Hazardous and Solid Waste Amendments requiring phased-in treatment of hazardous wastes before disposal.

**Loss on Ignition (LOI)** - A test criteria which determines percentage of mass loss measured when a sample of thermally stabilized plutonium is heated at a specific temperature for a specific time period to remove residual moisture and other volatile species from the sample. This test is used to determine the degree of chemical stability of the sample.

**Low-Level Waste (LLW)** - (1.) Waste that contains radioactivity and is not classified as high-level waste, transuranic waste, or spent nuclear fuel or (2.) byproduct material as defined by DOE Order 5820.2A (DOE 1988D). Test specimens of fissionable material irradiated for research and development only, and not for the production of power or plutonium, may be classified as low-level waste, provided that the concentration of transuranics is less than 100

nanocuries per gram. Typically contains small amounts of radioactivity in large volumes, and most can be handled without protective shielding. Solid low-level waste consists of trash such as clothing, tools, and glassware. Liquid waste consists primarily of water circulated as cooling water.

**Mixed Residue (also Residues)** - Plutonium bearing materials which contain recoverable quantities of plutonium in concentrations greater than the economic discard limit, and RCRA-regulated constituents. Residues were historically stored for the speculative recovery of plutonium in preference to the greater cost of new plutonium production in a reactor. By court decision the residues are regulated as hazardous wastes and they have radioactivity levels similar to Transuranic wastes.

**Mixed Waste** - A substance which meets the definition of both radioactive waste, as defined in DOE Order 5820.2A, and hazardous waste as defined in 6 CCR 1007-3, Part 261. Mixed waste contains both radioactive and hazardous components, as defined by the Atomic Energy Act and the Resource Conservation and Recovery Act, respectively.

**Mortgage** - see Base Activities.

**Nondestructive Assay (NDA)** - Refers to the use of nuclear radiation to measure the quantity of fissionable material present in a container without opening it.

**Operable Unit (OU)** - A discrete portion of a site consisting of one or more release sites considered together for assessment and cleanup activities. The primary criteria for placement of release sites into an operable unit include geographic proximity, similarity of waste characteristics and site type, and possibilities for economy of scale.

**Operations** - The set of DOE funded activities at DOE sites encompassing production, research, analysis, and other activities unrelated to the remediation of health or environmental hazards. Operation does not encompass those site support functions (utilities, roads, security, etc.) that would be necessary for the continued functioning of the Site in the absence of an operational mission. DOE-funded manufacturing, assembly, procurement, or other activities whose end result is a definable, physical product.

**Pipe Component** - A package designed for plutonium residues which allows increased amounts of plutonium by weight within the TRUPACT II container, immobilizes fine particles, reduces exposures by increased shielding, and limits gas generation dangers. Current designs use 304 Stainless Steel Schedule 40 pipe ranging from 4 to 12 inches in diameter with a vented cap.

**Potential Area of Concern (PAC)** - A location which may have experienced a release of a contaminant to the environment, requiring further characterization to determine the nature and extent of the release.

**Potential Incident of Concern (PIC)** - An incident or event which may have caused a release of a contaminant to the environment, requiring further characterization to determine the nature and extent of the release.

**Plutonium (Pu)** - A heavy, radioactive, metallic element with the atomic number 94; its most important isotope is fissionable Pu-239, produced by neutron irradiation of uranium-238; produced artificially by neutron bombardment of uranium; emits alpha, beta, gamma, and neutron radiation.

**Preliminary Remediation Goal (PRG)** - Defined concentration levels of specific contaminants which are used to focus characterization efforts and facilitate remedial decisions. PRGs are usually based on conservative risk analysis concentrations, background concentrations, or minimum detectable concentrations.

**Processing** - A term used to describe any handling step of plutonium- or enriched uranium-bearing materials involving unpackaging, sorting, plutonium assay, stabilization, repack, aging, or inspect and certification.

**Protected Area (PA)** - An area with physical barriers (e.g., walls or fences), which is subject to access controls and meets the standards of DOE Order 5632.2A. At Rocky Flats, the triple-fenced area north of Central Avenue where most of the major production buildings are located.

**Radiological Controlled Area (RCA)** - An area to which access is controlled in order to protect individuals from exposure to radiation and radioactive materials.

**Real-Time Radiography (RTR)** - A nondestructive examination technique which uses X-Rays to generate a video image of a container's contents. It is used as a screening diagnostic tool to verify the condition of material within waste drums and is particularly useful for identifying the presence of free liquids in solid waste drums.

**Record of Decision (ROD)** - The CERCLA document used to select the method of remedial action to be implemented at a site after the Feasibility Study/Proposed Plan process has been completed. Also, a NEPA document that lists the decisions and rationale/bases for the decisions.

**Regulations or Requirements** - federal or state laws and other standards having the force of law, which are legally applicable to the operation or cleanup of a DOE facility. Regulations or requirements are legally enforceable by entities other than DOE.

**Release Criteria** - Requirements, including maximum allowable residual contamination levels, which must be met prior to release of a facility for alternate use, either by DOE or the public, following dispositioning. Release criteria may be further specified as either conditional or restricted release criteria or unrestricted release criteria. Radiological criteria for unrestricted release are found in DOE Order 5400.5.

**Remedial Action (RA)** - (1.) As applied to operations, the mandatory response when a required operational condition cannot be met. Remedial actions include maximum duration for facility operation in an out-of-tolerance condition before it is required to terminate operations. (2.) As applied to environmental restoration, the actual construction or implementation phase of a Superfund site cleanup.

**Remedial Investigation (RI)** - An in-depth study designed to gather the data necessary to determine the nature and extent of contamination at a Superfund site, establish criteria for cleaning up the Site, identify preliminary alternatives for remedial actions, and support the technical and cost analysis of the remedial alternatives. The RI provides the Site-specific information for the feasibility study.

**Remediation** - A general term encompassing any actions (including decontamination and removal) taken to reduce health or environmental hazards associated with the presence of hazardous or radioactive material at a DOE facility.

**Removal** - Physical relocation of hazardous materials in order to reduce or eliminate potential adverse health or environmental impacts. This term also has a specific meaning under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 101(23), where it denotes near-term, often temporary corrective actions and monitoring performed in response to a release of hazardous materials. In the context of CERCLA, removal activities are distinguished from remedial activities, which are more permanent, long-term corrective actions.

**Residential Scenario** - A defined set of risk analysis conditions which considers a 70-year resident at a contamination location with 24 hour per day, 365 day per year contact with air, water, soil, and other contaminant pathways. This represents the most conservative use scenario in analyzing the risk to humans from exposure to environmental contamination.

**Resource Conservation & Recovery Act (RCRA)** - The Act and subsequent amendments, as codified in Title 40 CFR, Parts 260-270, provide for the protection of human health and the environment through proper management and minimization of hazardous wastes. Residues are also TRU or TRUM waste.

**Safe Secure Transport (SST)** - A tractor and trailer assembly which has been modified to allow safe and protected highway shipment of plutonium and enriched uranium.

**Safe Storage** - Actions required to place and maintain a contaminated deactivated facility in a condition where future risk to workers, the public, and the environment from the facility is maintained within acceptable limits during a desired time period. Safe storage generally involves partial decontamination of the facility, followed by a period of interim care with all active systems (i.e., ventilation, utilities, fire protection) kept in service. The facility is secured by physical barriers and guards against intrusion and a surveillance program is implemented. Structural and contaminant conditions are continually monitored and maintenance work is performed as needed. Safe storage is essentially equivalent to the Nuclear Regulatory Commission term SAFSTOR.

**Safeguards** - An integrated system of physical protection, material accounting, and material control measures designed to deter, prevent, detect, and respond to unauthorized possession, use, or sabotage of special nuclear material. Safeguards include the timely indication of possible diversion of special nuclear material and credible assurance that no diversion has occurred.

**Safety Analysis Report (SAR)** - A formal report describing all aspects of a nuclear facility, including the findings of the safety analysis process for that facility and/or its operations. A SAR delineates the various safety analyses performed including postulated accidents, frequency of occurrence, potential consequences, and associated risks; and provides a summary of the findings of the safety analysis along with an assessment of risk to the public, employees, facility, and environment resulting from normal operations, operational accidents, and natural phenomena events. A Preliminary SAR is prepared during the design phase of a new facility and a Final SAR is prepared and approved prior to starting operations.

**Safety Envelope** - The defined set of operating conditions for Rocky Flats facilities that ensures the safety of workers, the public, and the environment in accomplishing the Rocky Flats mission. It is the basis for the DOE authorization to operate the facility.

**Saltcrete** - A low-level mixed waste resulting from the cementation of spray evaporated wet salt material. The spray evaporation is the final step for the current Rocky Flats treatment of low-level liquid wastes.

**Scrub alloy** - A product resulting from the pyrochemical reduction of plutonium salt residues to remove the higher activity americium and place it into a self-shielding button for further processing at the Savannah River Site. The plutonium salts were created as a residue by the pyrochemical purification (Molten Salt Extraction) of plutonium metal.

**Shipment** - The activity or process of shipping; i.e., preparing and tendering a shipment to a carrier for off the site transport. The term includes packaging, labeling, marking, and preparation of shipping papers necessary for shipment.

**Site** - A contiguous area of land (which may or may not be divided by a public right-of-way) containing one or more DOE facilities, which is either owned or leased by DOE or the federal Government. The general public may or may not have access to a DOE site.

**Special Nuclear Material (SNM)** - Plutonium, U-233, uranium enriched in the isotope 233 or in the isotope 235, and any other material that the U.S. Nuclear Regulatory Commission, pursuant to the provisions of Section 51 of the Atomic Energy Act of 1954, determines to be special nuclear material, but does not include source material.

**Stabilization** - A process by which a material is converted through chemical or physical steps to a form that is chemically inert, neither reactive nor corrosive, in an ambient environment.

**Stakeholder** - Any person, agency, corporation, or organization that claims an interest in or will be potentially affected by current and planned activities at a DOE site, regardless of whether they are aware of this potential. Stakeholders may include, but are not limited to, local, state, and federal government agencies, private citizens or citizen groups, American Indian tribes, and corporations. Any DOE organization (e.g., DP, EM-30) which claims an interest in or will be potentially affected by current and planned activities at a DOE site, regardless of whether they are aware of this potential.

**Standards or Guidelines** - Internal DOE requirements and criteria, usually promulgated in DOE Orders or Notices, which do not have the force of law but which formally define DOE policy and practice in a particular area. Standards or guidelines also include national consensus standards and accepted industry codes and practices that DOE has adopted. Draft or proposed regulations that are expected to become effective in the near future may also (on a case basis) be adopted as standards by the DOE.

**Storage** - Retention and monitoring of waste in a retrievable manner pending final disposal, although the degree of retrievability may vary considerably. This term also has a specific

meaning under RCRA, which defines a "storage facility" as one which engages in the holding of a hazardous waste (as defined under RCRA) for a temporary period, after which the waste is treated, disposed of, or stored elsewhere. Specific storage time limits for hazardous wastes and operating requirements for permitted storage facilities are established under RCRA.

**Surveillance (also Surveillance & Maintenance or S&M)** - Routine, periodic activities undertaken to monitor the condition of deactivated facilities containing radioactive or hazardous material in order to maintain such facilities in a safe condition and to detect facility conditions that could lead to the release of radioactive or hazardous substances to the environment. Examples of surveillance activities include routine radiological measurements and physical inspections. Maintenance actions may be undertaken to correct problems identified during surveillance activities.

**Thermal Desorption** - A stabilization process that uses an increase in temperature and/or a decrease in pressure to remove volatile constituents from a complex mixture.

**Transuranic Element** - An element above uranium in the periodic table (i.e., with an atomic number greater than 92); all eleven known transuranic elements are radioactive and are produced artificially; e.g., curium, lawrencium, and plutonium.

**Transuranic Package Transporter (TRUPACT II)** - A special container used to transport drums or boxes of transuranic waste.

**Transuranic Waste (TRU)** - Without regard to source or form, waste that is contaminated with alpha-emitting transuranic radionuclides with a half-life greater than 20 years and concentrations greater than or equal to 100 nanocuries per gram at the time of assay.

**Transuranic-Mixed Waste (TRUM)** - Transuranic waste containing both radioactive and RCRA-regulated hazardous components.

**Treatment** - Method, technique, or process that alters the chemical or physical nature of a waste material to reduce its toxicity, volume, or mobility or render it more amenable for transport, storage, or disposal. Used in the context of RCRA, it has the same meaning.

**Under Building Contamination (UBC)** - Locations underneath building basements or foundations which may have experienced a release of a contaminant to the environment, requiring further characterization to determine the nature and extent of the release.

**Unrestricted Reuse** - The reuse of a site or facility following dispositioning without institutional controls or restrictions. Unrestricted reuse implies that the facility or land is safe for release from DOE ownership and control; this may or may not actually occur. Unrestricted reuse of a facility also requires that applicable unrestricted release criteria first be met.

**Waste Acceptance Criteria (WAC)** - A specific set of conditions and standards which must be satisfied for waste to be accepted by a treatment, storage, or disposal facility.

**Waste Isolation Pilot Plant (WIPP)** - Research and demonstration facility located at Carlsbad, New Mexico, intended to demonstrate safe disposal of radioactive waste in a deep geologic environment. A decision on whether to convert WIPP to a disposal facility for transuranic waste will be made after successful testing is demonstrated.

**Waste loading** - A term which refers to the amount of waste incorporated during treatment into a final waste form. Higher waste loadings indicate a greater amount of waste as a component of the final treated volume or weight, and thus are sought to minimize amounts for storage or disposal. Low waste loadings imply treatment which is not very effective or generates large amounts to store or dispose.

**Waste Minimization** - The reduction, to the extent feasible, of waste volume prior at any point in the life cycle. Waste minimization includes any source reduction or recycling activity that results in either: (1.) reduction of total volume of hazardous waste; (2.) reduction of toxicity of hazardous waste; or (3.) both.

**Weapons Material** - Includes DOE weapons, any assemblies, components, or parts thereof, and associated test and handling equipment.



## APPENDIX 3

# MAJOR STATUTES, REGULATIONS, AGREEMENTS, ORDERS AND PLANS AFFECTING ROCKY FLATS

### INTRODUCTION

This section summarizes the major statutes, regulations, agreements, permits, orders, and plans that affect operations and other activities at the Rocky Flats Environmental Technology Site (RFETS or Site); namely, environmental protection, waste management, environmental restoration, nuclear safety, worker health and safety, emergency preparedness, and public involvement. These items described below all act as drivers for site activities, both externally and internally imposed. Each of these drivers has been developed and applied for a particular purpose with minimal integration in most cases. Development of the Accelerated Site Action Project (ASAP) identifies a path forward which will be generally consistent with these drivers but may vary considerably in the details, especially regarding schedules. The next step in development of the ASAP will require specific identification of changes necessary to align each of the implementation efforts for each driver with the integrated ASAP. For purposes of this conceptual document a single sentence summary of the expected changes will be provided in italics at the end of each paragraph.

### ENVIRONMENTAL PROTECTION

**National Environmental Policy Act, 42 USC 4321:** The National Environmental Policy Act (NEPA) applies to any federal action that could significantly affect the quality of the human environment. For actions triggering NEPA, the federal agency that is proposing the action must identify potential consequences of the action and investigate reasonable alternatives before making a final decision. Periodically, a sitewide Environmental Input Statement (EIS) may be required to evaluate the cumulative effect of actions that have not, by themselves, required an EIS. The most recent sitewide EIS for the Site was issued in 1980; however, DOE is in the process of developing a new sitewide EIS (SWEIS) to address changes in the Site's mission. *Identify a new alternative describing the ASAP to be added to the list of alternatives for analysis.*

**Site-Wide Environmental Strategy Agreement, 9/6/95 (Draft):** The Site-Wide Environmental Strategy Agreement (SWESA) was proposed by Kaiser-Hill "...for the primary purpose of creating and maintaining the administrative and legal conditions which enable the safe and compliant, rapid closure of RFETS through the accomplishment of necessary environmental restoration, waste management, Deactivation and decontamination (D&D), and special nuclear material activities." An enabling provision of the proposed agreement is to coordinate all applicable, relevant, and appropriate statutes and regulations to eliminate overlap and reconcile conflicts under the single CERCLA-based compliance framework. Adoption of the SWESA

would essentially integrate all regulatory requirements except for those which are primarily operational in nature. *Reach agreement with regulators for adoption of the SWESA.*

**Clean Air Act, 42 USC 7401:** The modern version of the Clean Air Act (CAA) was enacted in the early 1970s to address the worsening condition of the nations air. Initially, large new sources of air pollution were to bear the burden of cleaning up the air. However, this program met with limited success and was amended in 1990. The new law significantly expanded the existing programs and instituted a new operating permit program for existing major sources of air pollution. Under regulations promulgated in 1989, the National Emission Standards for Hazardous Air Pollutants (NESHAPs) limit the radiation dose to the public from airborne radionuclide emissions from DOE facilities to 10 millirem per year (mrem/yr) effective dose equivalent (EDE). *No major changes anticipated for air emissions, except for environmental cleanup emissions to be addressed under SWESA.*

**Safe Drinking Water Act, 42 USC 300f to j:** The Safe Drinking Water Act (SDWA) sets national standards for contaminant levels in public drinking water systems. DOE is required to monitor drinking water quality for a variety of parameters, including radionuclides. SDWA maximum contaminant level standards are being used in conjunction with risk assessments to develop cleanup standards for remediation activities at Rocky Flats. *Requirements addressed under SWESA.*

**Clean Water Act, 33 USC 1251:** The Clean Water Act (CWA) is intended to "restore and maintain . . . waters of the United States, "to protect human health and safety, and to "provide for the protection and propagation of fish, shellfish, and wildlife." The regulations that implement the CWA contain limitations and permitting requirements for discharges of hazardous substances from "point sources." Storm water runoff, sewage treatment plant discharges, and water extracted from the ground as part of CERCLA/RCRA cleanup activities are the principal discharges from the Rocky Flats Site. The Colorado Water Quality Act (Colo. Rev. Stat. 25-8-101) sets forth the state's requirements for addressing water quality issues in the state of Colorado. *Standards and requirements met under SWESA.*

**National Pollutant Discharge Elimination System (NPDES)/Federal Facilities Compliance Agreement (FFCA), EPA Docket No. 91-03-05:** The NPDES permit program controls the release of pollutants to waters of the United States and requires routine monitoring and reporting of point source discharges. Rocky Flats was first issued an NPDES permit by EPA in 1974. The permit was reissued in 1984, expired in 1989, and was extended administratively until renewed. The permit identifies seven monitoring points for control of discharges, three of which are capable of discharging water off-site. *No substantial change needed to sewage treatment plant permit; surface water discharges addressed under SWESA.*

**Endangered Species Act (ESA), Fish and Wildlife Coordination Act, Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, Executive Orders 11990 (Protection of Wetlands) and 11988 (Floodplain Management):** Collectively, these federal statutes and Executive Orders govern the protection and management of ecological resources across the RFETS. Key aspects in the ecological areas are consideration of threatened or endangered species or their habitats, surveys for potentially impacted species, and mitigation of impacts to wetland areas. *No major change expected, although some of the wetlands and floodplain issues may be incorporated under SWESA.*

## **WASTE MANAGEMENT**

**Atomic Energy Act, 42 USC 2011:** Regulations promulgated by the U.S. Nuclear Regulatory Commission (NRC) and the DOE under the Atomic Energy Act (AEA) establish standards for the management of Special Nuclear Material (SNM) and the protection of the public against radiation. Additional NRC requirements apply to the licensing, packaging, preparation, and transportation of radioactive materials and radioactive wastes. Although the NRC does not have regulatory authority over the Rocky Flats Site, or other DOE facilities, DOE complies with applicable NRC requirements through DOE Orders. Rocky Flats generates and stores two types of radioactive wastes that are governed by these DOE Orders: transuranic (TRU) waste and low-level waste (LLW). *Focus under ASAP to necessary and sufficient requirements; no substantial change for special nuclear materials.*

**Solid Waste Disposal Act, 42 USC 6901:** The Solid Waste Disposal Act (SWDA) regulates the management of solid wastes. Solid waste is broadly defined to include any garbage, refuse, sludge, or other discarded material, including solid, liquid, semisolid, and contained gaseous materials resulting from industrial, commercial, mining, or agricultural activities. Sanitary waste is currently being disposed of in the existing onsite landfill, which will soon reach its maximum capacity. *Requirements addressed under SWESA.*

**Resource Conservation and Recovery Act, 42 USC 6921:** Enacted in 1976, the Resource Conservation and Recovery Act (RCRA) substantially expanded the SWDA to regulate solid wastes that are hazardous. Regulations promulgated under RCRA, as amended by the Hazardous and Solid Waste Amendments (HSWA), set forth management standards for generators and transporters of hazardous wastes and prescribe an operating permit program for owners and operators of treatment, storage, and disposal facilities (40 CFR 260-280). The EPA has authorized CDPHE to administer Colorado's RCRA program through the Colorado Hazardous Waste Act (CHWA) and associated implementing regulations (Colo. Rev. Stat. 25-15-101 and 6 Code Colo. Regs. 1007-3). Hazardous waste operations at RFETS are governed by Permit No. 91-09-30-01, issued by CDPHE. *Major modification to RCRA Part B permit and requirements addressed under SWESA.*

**Federal Facility Compliance Act, 42 USC 6961:** The Federal Facility Compliance Act (FFC Act) subjects DOE to the imposition of civil fines as penalties for violations of hazardous waste laws at DOE facilities and establishes requirements for developing mixed waste treatment capacities and technologies to treat all the mixed wastes (i.e., radioactive wastes containing hazardous constituents) that are generated and stored at DOE facilities. *Requirements addressed under SWESA.*

**Federal Facility Compliance Agreement II (FFCAII) - EPA Docket No. RCRA (3008) VIII-89-25:** Due to a lack of treatment capability for mixed waste, RFETS has continued to store mixed wastes onsite beyond the 1-year storage limit imposed by RCRA's Land Disposal Restrictions (LDR) (40 CFR 268). The FFCAII, negotiated between DOE and EPA, establishes procedures for achieving compliance with the LDR. The FFCAII went into effect on May 11, 1991, and expired on May 10, 1993. Although a new agreement has not been signed, RFETS continues to comply with the terms of the FFCAII. *Requirements addressed under SWESA.*

**Hazardous Materials Transportation Act, 49 USC 1801:** Regulations promulgated under this statute define Department of Transportation (DOT) requirements for the packaging, handling, and transportation of hazardous materials (49 CFR 171-178). DOE must comply with these regulations when packaging and transporting waste to the Nevada Test Site, Waste Isolation Pilot Plant, and commercial hazardous waste disposal facilities. *No substantial changes.*

**Settlement Agreement and Compliance Order on Consent, State of Colorado Docket No. 93-04-23-01 (also known as the Mixed Residue Agreement):** This administrative compliance order, issued by CDPHE, requires EG&G and DOE to implement a Mixed Residue Reduction Program and prescribe requirements for processing certain mixed residue wastes for eventual offsite disposal. *Requirements addressed under SWESA.*

**Judicial Order Arising from Sierra Club v. DOE, Civil Action 89-B-181 (August 25, 1994) (also known as the Residue Compliance Agreement):** In 1989, the Sierra Club filed a citizen's enforcement action in U.S. District Court (Civil Action No. 89-B-181), seeking declarations that residues mixed with hazardous wastes are RCRA-regulated wastes. The Sierra Club's request was granted by the court on April 12, 1990 (Sierra Club v. DOE, 734 F. Supp. 946, D. Colo., 1990), and has undergone several subsequent additions and modifications. *Requirements addressed under SWESA.*

**Toxic Substances Control Act (TSCA):** This act broadly authorizes the EPA to test for and regulate chemical substances that enter the environment. Regulation of most substances has been superseded by other stricter or more prescriptive laws that followed TSCA, such that the main substances still covered primarily by TSCA are polychlorinated biphenyls (PCBs) and asbestos. *Requirements addressed under SWESA.*

## ENVIRONMENTAL RESTORATION

**Comprehensive Environmental Response, Compensation, and Liability Act**, 42 USC 9601: The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) establishes criteria for determining liability and governmental response authorities for the release or threat of release of a hazardous substance, pollutant, or contaminant to the environment. The EPA is the regulating authority for this statute. Implementing regulations are contained in the National Contingency Plan (NCP) (40 CFR 300). Rocky Flats was placed on CERCLA's National Priorities List for remedial action in 1989. *Fundamental regulatory basis for requirements addressed under SWESA.*

**Resource Conservation and Recovery Act**, 42 USC 6921: In addition to regulating newly generated hazardous wastes, RCRA regulates the cleanup of contaminated solid waste management units through its corrective action requirements for solid waste management units at RCRA-regulated facilities (40 CFR 264, Subpart S). Under this federal regulation, the owner or operator of a facility seeking a RCRA permit must initiate remedial investigations and/or corrective actions, as necessary, to protect human health and the environment. *Requirements addressed under SWESA.*

**Interagency Agreement**, EPA Docket Nos. CERCLA-VIII-91-03, RCRA (3008[h])-VIII-91-07, State of Colorado Docket No. 91-01-22-01: This 1991 administrative order, commonly referred to as the "IAG," delineates roles and responsibilities among DOE, the CDPHE, and EPA, and establishes schedules for completing environmental restoration activities at the Site's 16 operable units. The IAG relies on a variety of other legal sources for specific guidance on how to undertake environmental restoration, including CERCLA and RCRA. Negotiations for a new agreement, referred to as the Rocky Flats Cleanup Agreement, are currently under way. Although compliance schedules and environmental management directives are likely to shift, it is expected that the new agreement will still be based on the remediation process prescribed by CERCLA's National Contingency Plan (NCP). *Requirements addressed under SWESA.*

**Agreement in Principle**, State of Colorado Docket No. 89-06-28: This 1989 administrative agreement between DOE and CDPHE committed DOE to an expanded environmental monitoring program at Rocky Flats, as well as to accelerated cleanup activities at some contaminated sites, and to the implementation of several initiatives for achieving a more comprehensive environmental management system. Although the agreement expired in September 1994, Rocky Flats continued to comply with its provisions, and a new agreement was signed on May 5, 1995. *Requirements addressed under SWESA.*

## NUCLEAR SAFETY

**Atomic Energy Act**, as amended by the Price-Anderson Amendments Act of 1988, 42 USC 2011: The Atomic Energy Act (AEA), as amended by the Price-Anderson Amendments Act of 1988 (PAAA), is the principal authority for the regulation of the nuclear industry. In addition,

the PAAA subjects DOE contractors to potential civil and criminal penalties for violations of DOE rules, regulations, and orders relating to nuclear safety. Nuclear safety standards are implemented at Rocky Flats through a series of DOE Orders. *No substantial change anticipated except for a focus to necessary and sufficient requirements.*

## **WORKER HEALTH & SAFETY**

**Occupational Safety and Health Act, 29 USC 651:** This statute and its associated implementing regulations (29 CFR 1910 and 1926) establish standards for workplace safety and require employers to inform employees about workplace hazards. Occupational Safety and Health Act (OSHA) standards are implemented at Rocky Flats through a series of DOE Orders. *No substantial change anticipated except for a focus to necessary and sufficient requirements.*

**Defense Nuclear Facilities Safety Board Recommendation 94-1 (DNFSB 94-1),** pursuant to 42 USC 2286a(5): This is recommendation for integrated planning and actions to reduce the hazards from liquids and solid residues remaining in production buildings following the halt in production operations. *Fundamental focus is unchanged, some changes anticipated in the approach and schedule.*

**Defense Nuclear Facilities Safety Board Recommendation 94-3 (DNFSB 94-3),** pursuant to 42 USC 2286a(5): This is recommendation for completion of a seismic and structural analysis of Building 371, which is the currently planned location for consolidated plutonium storage. *Fundamental focus is unchanged to provide a seismically qualified building for plutonium storage; ASAP approach may find it preferable to use a new facility rather than upgrade B371.*

**DOE-STD-3013-94, Criteria for Safe Storage of Plutonium and Metal Oxides:** These criteria apply to safe storage of plutonium metals and oxides, greater than 50% plutonium by weight, for a minimum of 50 years at DOE facilities. Key aspects of the criteria include thermal stabilization of oxide to less than 0.5% loss on ignition, metal or oxide stored in inert atmosphere in a material container, material container sealed in a boundary container, boundary container sealed in a primary containment vessel, and periodic surveillance of filled containers. *No substantial change anticipated except for schedule acceleration as allowable.*

**Health and Safety Procedure 31.11 (HSP 31.11), 1-82500-HSP-31.11, Transfer and Storage of Plutonium for Fire Safety:** This Rocky Flats procedure defines responsibilities and requirements for packaging, transferring, and storing plutonium metals, oxides, and compounds to minimize the possibility of plutonium fires. *No substantial change anticipated except for a focus to necessary and sufficient requirements.*

## EMERGENCY PREPAREDNESS

**Emergency Planning and Community Right-to-Know Act, 42 USC 11001:** Enacted as an amendment to CERCLA, the Emergency Planning and Community Right-to-Know Act (EPCRA) requires all facilities that handle hazardous chemicals to send location and inventory data to local and state planning officials and to notify the National Response Center, the CDPHE Emergency Management Unit, and the Jefferson County, Colorado, Local Emergency Planning Commission in the event of an actual release. In addition, EPCRA requires that facilities discharging toxic substances to the environment report annually on the total quantity of materials released to all environmental media. *Requirements addressed under SWESA.*

## PUBLIC INVOLVEMENT

**Public Participation Programs Under the Resource Conservation and Recovery Act, the Safe Drinking Water Act, and the Clean Water Act, 40 CFR 25:** This federal regulation describes the minimum requirements and suggested program elements for public participation in activities conducted under the RCRA, SDWA, and CWA. Requirements are prescribed for public information, notification, consultation, and the creation of advisory groups. *Requirements addressed under SWESA.*

**Regulations for Implementing the Procedural Provisions of NEPA, 40 CFR 1500-1508 (1993):** These federal regulations describe procedures for implementing NEPA, which contains significant requirements for public involvement, including notice and comment provisions. *No significant changes.*

**National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR 300:** This federal regulation, also referred to as the National Contingency Plan (NCP), operates as the blueprint for implementing CERCLA. It includes opportunities for public involvement during the remedial investigation/feasibility study (RI/FS) process and the opportunity to comment on proposed Records of Decision (ROD). *Requirements addressed under SWESA.*

## PLANNING AND SITE DEVELOPMENT

**Community Environmental Response Facilitation Act, 42 USC 9620(h):** The Community Environmental Response Facilitation Act (CERFA) amended CERCLA to prescribe how obsolete federal facilities should be converted to other uses to minimize impacts on local communities. With implementation of the DOE National Conversion Pilot Project (NCP), Rocky Flats is taking the first steps toward developing future uses for the Site. The NCP is based on a proposal from Manufacturing Sciences Corporation to recycle non-plutonium-contaminated scrap material by reprocessing and recasting it into containers that will be used to store low-level waste and low-level mixed waste. *Requirements addressed under SWESA.*

**Rocky Flats Strategic Plan, September 19, 1994:** The Rocky Flats Strategic Plan establishes the vision, goals, and objectives for the RFETS for the foreseeable future of the site. It was developed based on similar strategic documents prepared by DOE Headquarters and represents the basic planning document for other site plans and budgets. *Substantial revision to align with ASAP.*

**Rocky Flats Future Site Use Working Group Recommendations, June 1995:** This document was prepared by a consensus group of stakeholders to address future RFETS use issues of interest to the surrounding communities and citizens. The ASAP is being developed to honor the findings of that group. *No expected changes required.*

**FY96 Baseline and other Budgetary Planning Documents:** As a federal facility the RFETS is constantly planning, budgeting, or executing a budget to fit the requirements of the Office of Management and Budget and the Congress. To the extent that specific actions are consistent with the ASAP, then the budgets will also require minimal revision. Where actions vary widely from ASAP, the budget revisions will be significant. *Overall revision of the budgeting documents and baselines from FY96 forward.*



## APPENDIX 4

### ROCKY FLATS PROBLEM DEFINITION EXPANSION

The concept of an accelerated safe interim closure of the Rocky Flats Environmental Technology Site (RFETS or Site), discussed in this document, is necessary based on four factors: (1) safety/risks; (2) funding and mortgage; (3) loss of experienced workforce; and (4) encroaching population. The following is a discussion of these factors.

#### 1. Safety/Risks

##### A. Acute Risks

Rocky Flats has numerous potential health and safety risks, which stem from the presence of significant quantities of nuclear materials; radioactive and hazardous wastes; contaminated facilities, land, and water; and surplus equipment and materials. Large annual expenditures are required to manage these facilities and materials in order to keep risks within acceptable levels. Clearly, the greatest risks are associated with the storage of large amounts of plutonium and uranium at the site. Plutonium, in particular, poses a significant risk because of its toxicity to humans and its pyrophoric nature. (See Appendix 1, Exhibit 1 for site inventories of plutonium and uranium metal and oxides, solutions, and residues.)

The site comprises more than 425 facilities. Many of the facilities that currently store nuclear materials were constructed more than 40 years ago. These facilities do not meet many of the current Department of Energy (DOE) or industry standards for the management of nuclear materials.

The DOE's report on plutonium vulnerabilities within the DOE Complex (*Plutonium Working Group Report on ES&H Vulnerabilities Associated with the Department's Plutonium Storage*) identified two of Rocky Flats plutonium facilities (i.e., Buildings 771 and 776) as the most vulnerable facilities in the DOE complex with respect to environment, safety, and health considerations. This evaluation considered the vulnerability of stored nuclear materials (i.e., plutonium, americium, and uranium) due to packaging and facility condition and the consequences of a facility incident. Three other Rocky Flats facilities (i.e., Buildings 779, 707, and 371) were among the next seven most vulnerable DOE plutonium facilities. (See Appendix 1, Exhibit 3 for locations of Buildings 771, 776, 779, 707, and 371).

A recent comprehensive safety inspection of RFETS conducted by DOE/HQ-EM in March and April of 1995 (*June 20, 1995, Final Draft of the Rocky Flats Comprehensive Inspection Report*) cited some of the following preliminary deficiencies in the site's environment, safety, and health activities: (1) lack of current authorization bases for site facilities (the purpose of authorization bases is to define facility hazards so that mitigative actions are identified and in place, where required); (2) existing facility safety analysis reports (SARs) do not reflect current conditions

(SARs set forth the "bounding conditions" about what can be safely done in a facility; the SARs normally constitute the primary source of the authorization bases); and (3) failure to follow some nuclear safety requirements due to inadequate maintenance practices or impairments of vital safety systems, such as engineered fire protection systems.

## **B. Chronic Risks**

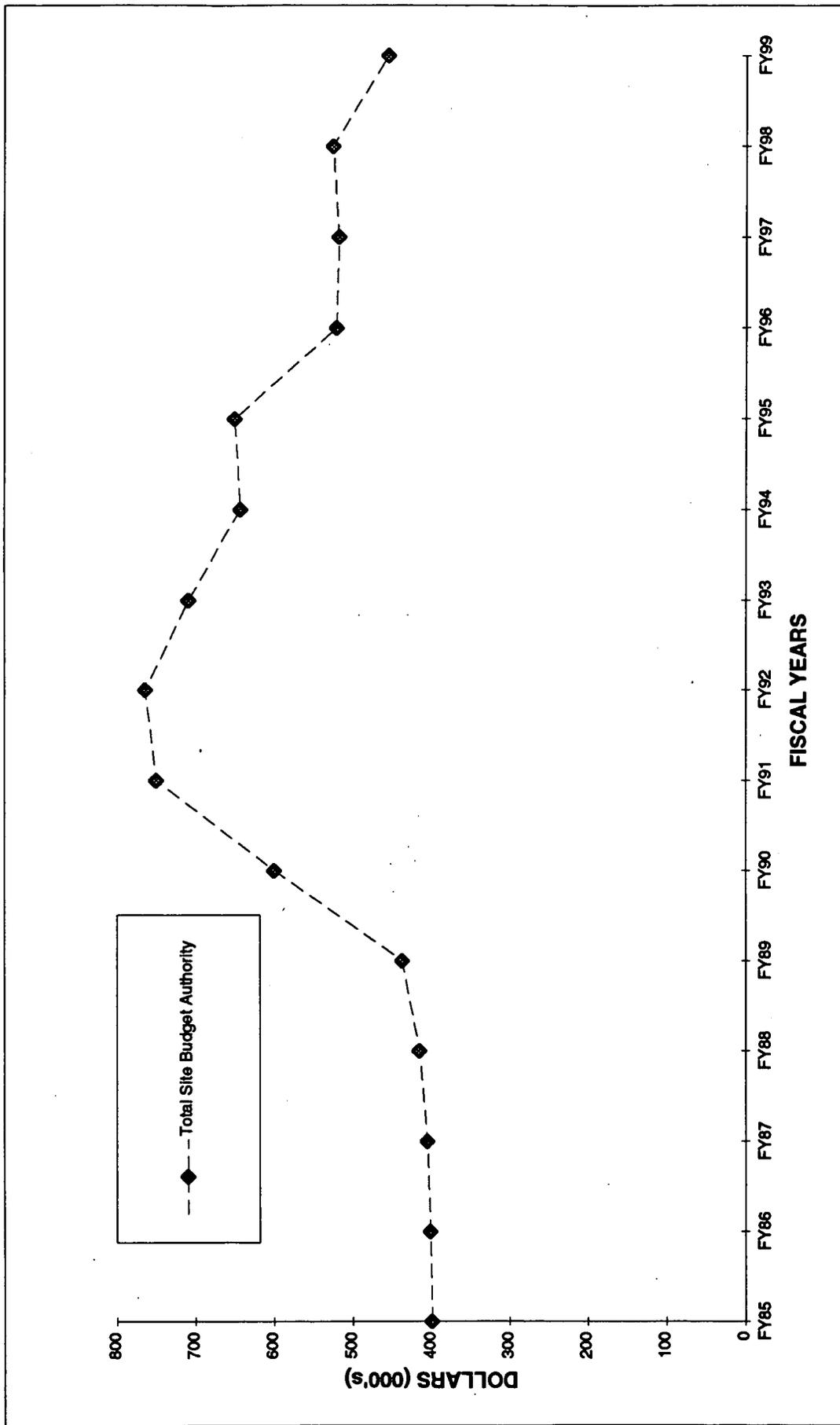
As a result of past releases to the environment and inadequate onsite waste disposal practices, the site has 178 Individual Hazardous Substance Sites (IHSSs). (See Appendix 1, Exhibit 5 for a location of the IHSSs.) These IHSSs generally consist of chemical and/or radiologically contaminated soils and ground and surface waters. Although some of these IHSSs have recently been cleaned up, a substantial number of IHSSs still need to be addressed. Although none of these IHSSs currently pose urgent risks to the workers or the surrounding populace, the risks will increase with time if left unchecked.

RFETS stores large quantities of chemically and/or radiologically contaminated containerized wastes. (See Appendix 1, Exhibit 1 for current waste inventories.) These wastes continue to be stored at the site due, primarily, to the lack of commercial and DOE treatment or disposal capacity. Many of these wastes cannot be disposed of until they are treated to destroy or immobilize the chemical constituents in the waste. Additionally, a significant number of containers of waste must be repackaged to ensure that their contents meet treatment or disposal site waste acceptance criteria (e.g., remove free liquids). In the interim, these wastes are stored in over 60 different facilities at the site. Some of these facilities were designed as temporary storage facilities but continue to be used today (e.g., cargo containers and tent structures). Because of significant quantities of waste at the site and the lack of large, robust, centralized waste storage facilities, many of these wastes are stored in areas where workers are present and pose a constant hazard to workers. Many of the Site's former nuclear weapons production facilities pose hazards to the people who now work in them. Thousands of liters of plutonium solutions are currently stored in tanks and pipes whose seals and flanges are deteriorating, with an increasing frequency of leaks. Radiological contamination is found in much ventilation ductwork and under painted floors, walls, and ceilings (in the past, contamination control often consisted of painting the contaminated area to "fix" the contamination). It has been estimated that there are over 600,000 square feet of contaminated gloveboxes, pipes, tanks, walls, floors, ducts and other structures in the former nine plutonium processing facilities. (*Conceptual Project Plan for A Path Forward, Version 5.0, 3/29/95*). Of the site's facilities, 121 considered are radiologically contaminated verified and suspect with plutonium (68) or uranium (53) to some degree. Delay in dealing with these contaminated facilities will increase the frequency of worker exposure and the risk of a significant release to the environment.

## **2. Funding and Mortgage**

The site is attempting to address many urgent and long-term risks while experiencing recent, significant reductions in its funding. (See Exhibit 1, next page). The highest funding priorities at

# Rocky Flats ETS FY Funding Comparison



Total Site Budget Authority

FY85	FY86	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99
399	401	405	415	437	600	750	764	709	643	650	520	517	525	454

Rocky Flats continue to be (1) Protecting the workers, the public, and the environment from the nuclear and other hazardous materials at the site; (2) safeguarding the plutonium and classified material from acts of terrorism and espionage; and (3) complying with applicable federal and state laws and regulations. These activities are complex, labor-intensive, and expensive. Often, these activities have been referred to as "base" or "mortgage" activities.

In large part, the high cost of maintaining the Site's facilities and support infrastructure (which compose the largest portion of the site's annual mortgage) is a result of the facilities not being able to meet commercial or DOE nuclear material management safety standards. In lieu of meeting many of these prescriptive standards, the Site has had to institute resource-intensive compensatory measures to ensure the safety of the facilities and the nuclear materials managed within them. For example, instead of operating engineered fire protection systems, labor-intensive round-the-clock human "fire watches" have been established in a number of the facilities. These types of compensatory measures combined with other facility safety costs (e.g., facility maintenance, safeguards and security, fire department, utilities, etc.) result in significant annual costs. This mortgage must be funded each year to ensure the safety of the workers, the public, and the environment. In FY95, these costs were estimated to be approximately \$350 million. For FY96, these costs are estimated to be approximately the same.

Clearly, there is a dwindling enthusiasm to continue funding the Site at the same levels it was funded in the early 1990s. These reductions, coupled with the high costs of safely maintaining the nuclear material in the Site's aging facilities, mean that planned accelerated environmental cleanup; stabilization of plutonium solutions, solids, and process residues; deactivation, decontamination, and decommissioning of facilities; and treatment and disposal of wastes will not occur expeditiously under current funding scenarios. This issue results in the Site's inability to significantly reduce the risks to the workers, the public, and the environment in the near future. Indeed, mortgage costs are expected to increase over time if the Site continues conducting business as it has in the past.

### **3. Loss of Experienced Workforce**

As the Site has aged, so has the population of skilled nuclear material workers. The skilled workers remaining at RFETS who have experience directly related to the handling of plutonium and uranium (i.e., primarily production workers who, in the past, routinely processed plutonium solutions for recovery, decontaminated facilities, and stabilized plutonium metals and oxides) are getting older and approaching retirement age. An internal study found that approximately 30 percent of the existing plutonium workers will be at retirement age by the year 2005. (*W. D. Ehler, informal communication, 9/25/95*) Additionally, many skilled workers have left the Site in the past few years, opting for voluntary separation programs that offered one-time cash buyouts, early retirement packages, and other incentives to leave the Site. Furthermore, funding cuts have also necessitated two involuntary layoffs since 1992. Clearly, the loss of skilled workers places the Site at some risk in the not-too-distant future, of not having a skilled workforce to deal with the special hazards associated with plutonium (and uranium) if stabilization activities are

protracted due to funding shortfalls. This fact strongly argues for accelerating critical plutonium and uranium stabilization and other liability reduction activities.

#### **4. Encroaching Population**

Over the past 40 years, the population north and east of the Site has grown tremendously toward the Site. It is estimated that nearly 2.2 million people live within a 50-mile radius of the site. (See Exhibits 2a, 2b, 2c, and 2d) One indication of this encroachment is the recent development of a large, new residential area in Superior, Colorado, approximately 3 miles northeast of the site Buffer Zone. Among DOE's major nuclear weapons sites, RFETS is unique to the extent that such a significant civilian population is located in such close proximity. Exhibit 4-3 shows continuing projected population growth in communities near the Site. The large and growing number of potential receptors (i.e., people) to an incident at the site is cause for concern. This factor, too, argues for acceleration of actions at the site.

Miles	Sector Name
0-1	Sector 1
1-2	Sector 2
2-3	Sector 3
3-4	Sector 4
4-5	Sector 5

1994  
Population and (Households)  
Sectors 1-5

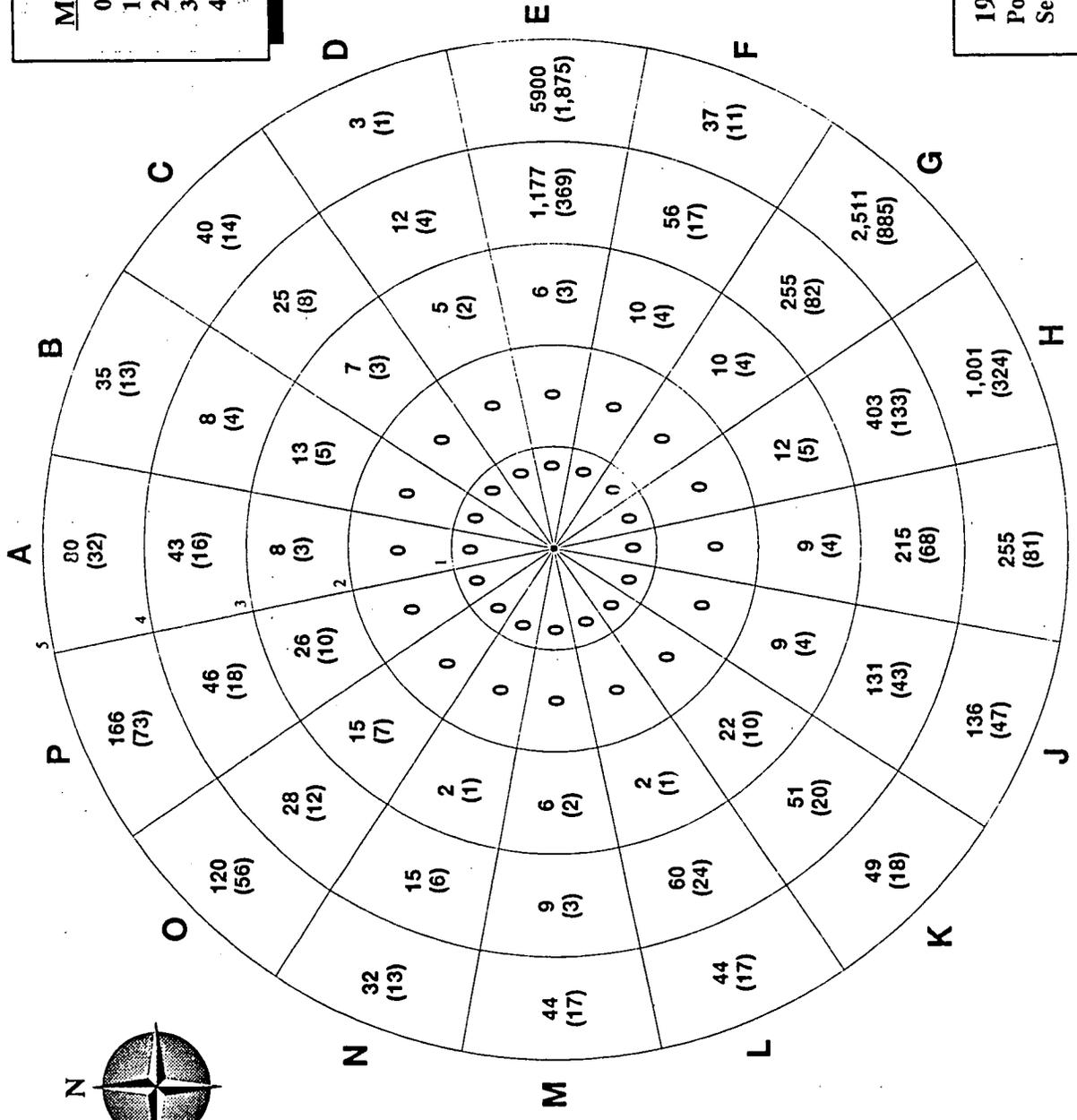


Exhibit 2a

**Miles**      **Sector Name**

- 5-10      Sector 10
- 10-20    Sector 20
- 20-30    Sector 30
- 30-40    Sector 40
- 40-52    Sector 52

**1994**  
**Population and (Households)**  
**Sectors 5-52**

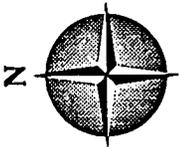
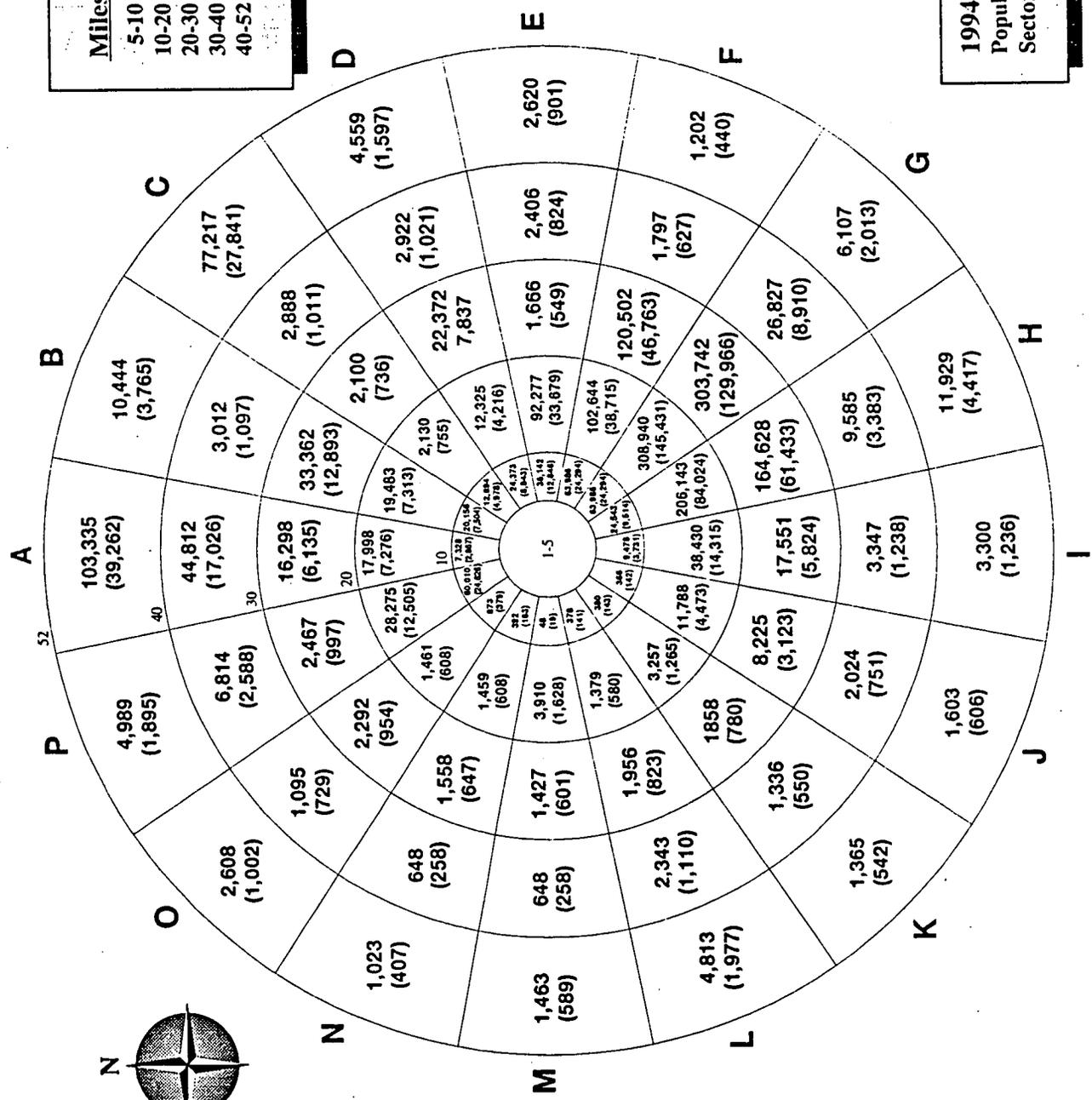


Exhibit 2b

Miles	Sector Name
0-1	Sector 1
1-2	Sector 2
2-3	Sector 3
3-4	Sector 4
4-5	Sector 5

**2005  
Population and (Households)  
Sectors 1-5**

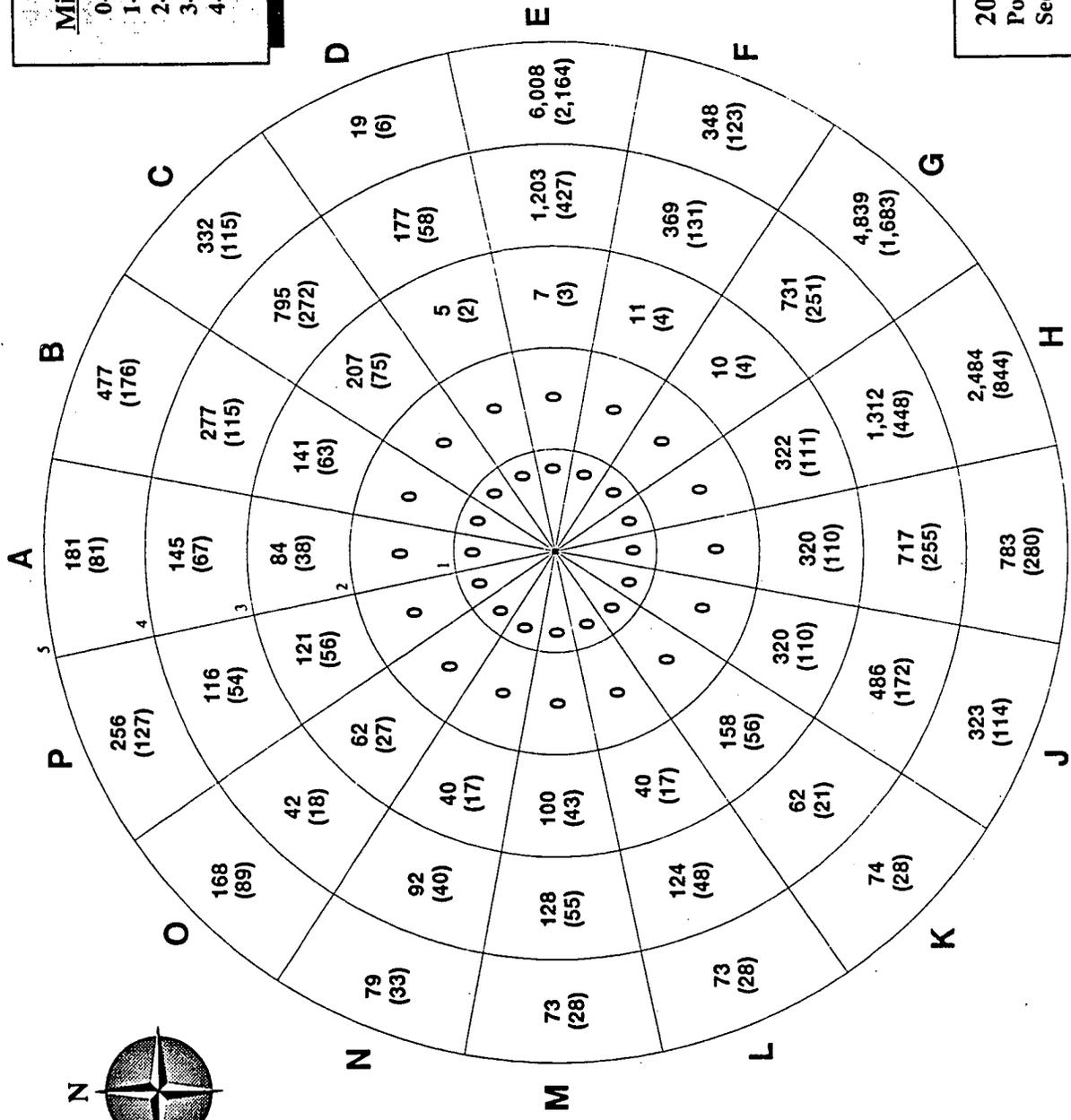


Exhibit 2c

Miles	Sector Name
5-10	Sector 10
10-20	Sector 20
20-30	Sector 30
30-40	Sector 40
40-52	Sector 52

2005	Population and (Households)
Sectors 5-52	

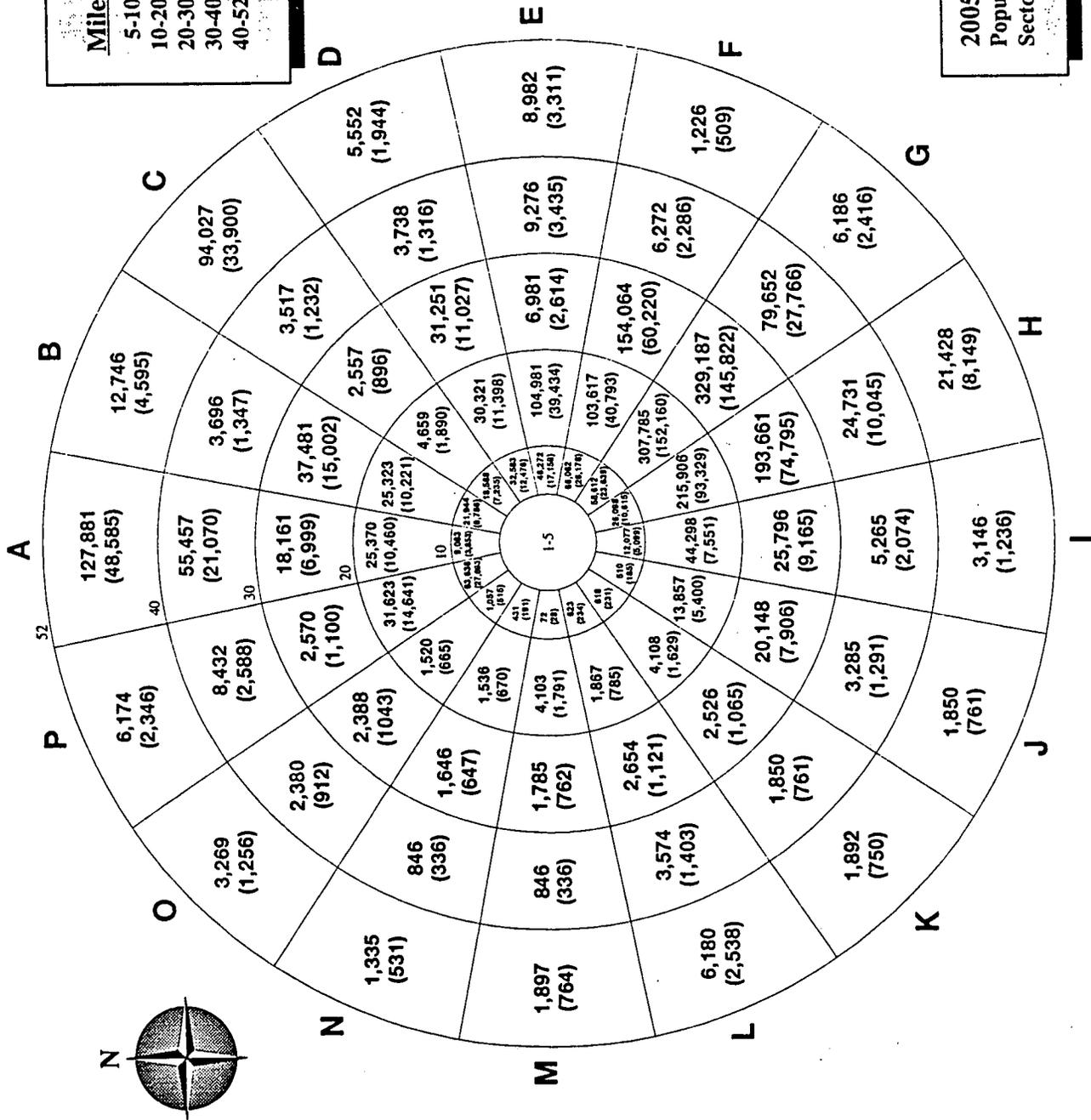


Exhibit 2d

