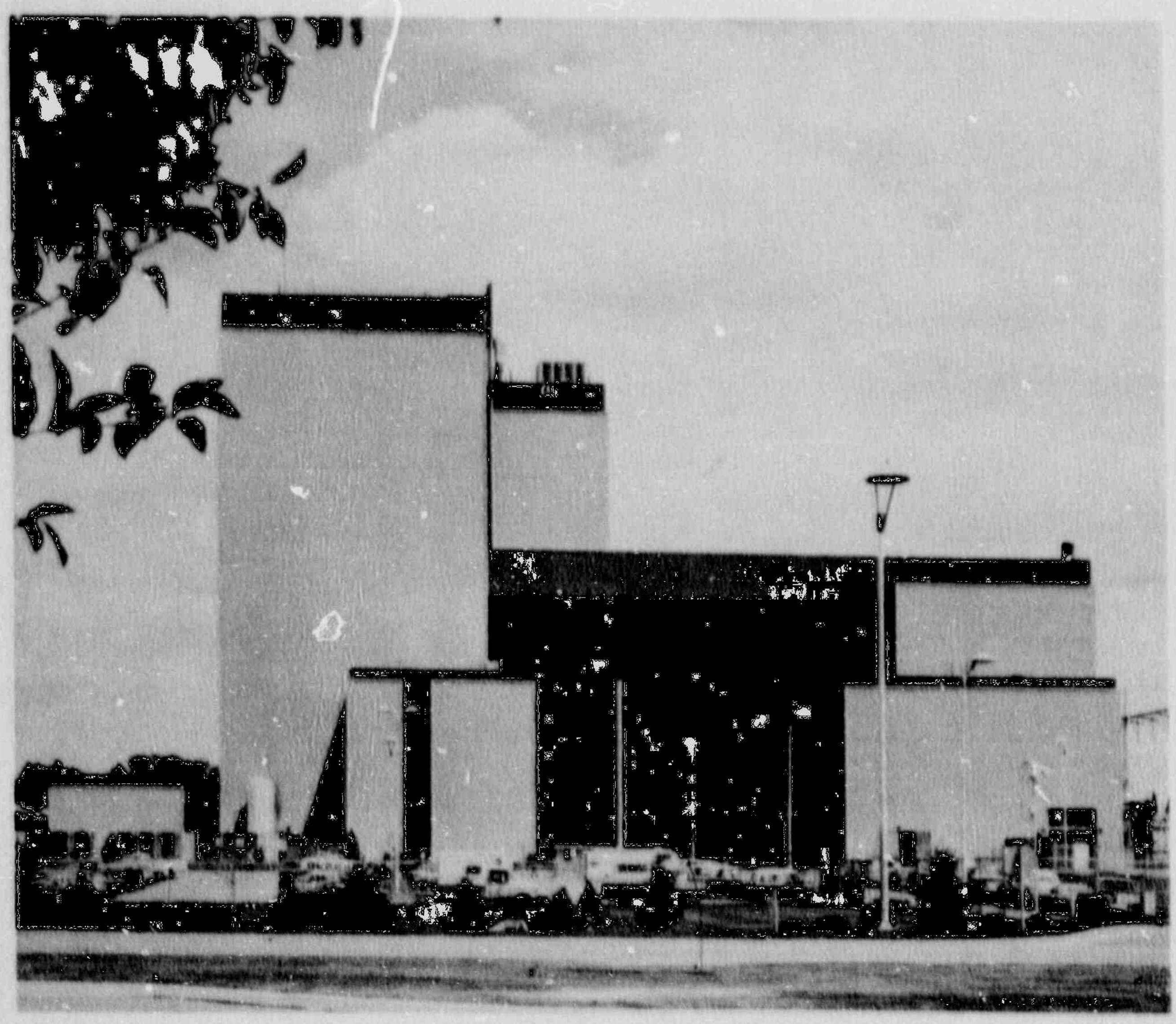

Proposed Decommissioning Plan
for the
Fort St. Vrain Nuclear Generating Station

Public Service Company of Colorado
November 1990

PROPOSED DECOMMISSIONING PLAN FOR FORT ST. VRAIN NUCLEAR GENERATING STATION

TABLE OF CONTENTS

APPENDICES

LIST OF TABLES

LIST OF FIGURES

COMMONLY USED ACRONYMS

AEC	Atomic Energy Commission
ALARA	As Low As Reasonably Achievable
ANSI	American National Standards Institute
AOO	Anticipated Operational Occurrences
ASTM	American Society of Testing and Materials
ATC	Auxiliary Transfer Cask
BNL	Battelle Northwest Laboratories
BOC	Beginning of (fuel) Cycle
BOP	Balance of Plant
CDOH	Colorado Department of Health
CEBAF	Continuous Electron Beam Accelerator Facility
CFR	Code of Federal Regulations
Ci	Curie
CPI	Consumer Price Index
CPM	Counts per minute
CPUC	Colorado Public Utilities Commission
CRD	Control Rod Drive
CRDOA	Control Rod Drive and Orifice Assembly
CSF	Core Support Floor
D/D	Decontamination and Dismantlement
DAW	Dry Active Waste
DBE	Design Basis Earthquake
DECON	Immediate Decontamination/Dismantlement Decommissioning Option
DOE	Department of Energy
DOT	Department of Transportation
DPM	Disintegrations per minute
DTS	Decommissioning Technical Specifications
EAB	Exclusion Area Boundary
EAL	Emergency Action Level
ECP	Executive Command Post
EFPD	Effective Full Power Days
EOC	End of (fuel) Cycle
EOF	Emergency Operations Facility
EPA	Environmental Protection Agency
EPRI	Electric Power Research Institute
EPZ	Emergency Planning Zone
ERF	Emergency Response Facility
ESW	Equipment Storage Wells
FCP	Forward Command Post (EOF)
FHM	Fuel Handling Machine
FNAL	Fermi National Atomic Laboratory

FSV	Fort St. Vrain
FSW	Fuel Storage Wells
GA	General Atomics
GET	General Employee Training
GM	Geiger-Mueller
GTCC	Greater Than Class 'C' (Radioactive) Waste
HEPA	High Efficiency Particulate Air (Filter)
HLRW	High Level Radioactive Waste
HLWR	High Level Waste Repository
HPGe	Hyper-Pure Germanium
HSF	Hot Service Facility
HTGR	High Temperature Gas-Cooled Reactor
HVAC	Heating, Ventilation and Air Conditioning
IDO	Idaho Operations Office
INEL	Idaho National Engineering Laboratories
INPO	Institute of Nuclear Power Operations
IPEEE	Individual Plant Examination of External Events
IPP	Independent Power Producer
ISFSI	Independent Spent Fuel Storage Installation
KI	Potassium Iodide (tablets)
LANL	Los Alamos National Laboratory
LLD	Lower Limit of Detection
LLRW	Low-Level Radioactive Waste
LSA	Low Specific Activity
MCRB	Metal Clad (Reflector) Block
MDA	Minimum Detectable Activity
MicroR	1E(-6) Rem
MVDS	Modular Vault Dry Storage (System)
NDE	NonDestructive Examination
NFS	Nuclear Fuel Services
NFSC	Nuclear Facility Safety Committee
NIOSH	National Institute of Occupational Safety and Health
NIST	National Institute of Standards and Technology
NRC	Nuclear Regulatory Commission
NSSS	Nuclear Steam Supply System
OCC	Office of Consumer Counsel
OFSAR	Updated FSAR
ORE	Occupational Radiation Exposure
OSHA	Occupational Safety and Health Administration
PCC	Personnel Control Center
pCi	Pico Curie (1 E-12 Curies)
PCP	Process Control Program
PCRV	Prestressed Concrete Reactor Vessel
PDP	Proposed Decommissioning Plan
PORC	Plant Operations Review Committee
PURPA	Public Utility Regulatory Policies Act

PSC	Public Service Company of Colorado
QA	Quality Assurance
QC	Quality Control
R/B	Release to Birth Rate
RCA	Radiologically Controlled Area
RCD	Region Constraint Device
RCRA	Resource Conservation and Recovery Act
REM	Roentgen Equivalent Man (Radiation Measure)
REMP	Radiological Environmental Monitoring Program
RIV	Reactor Isolation Valve
S/G	Steam Generator
SAFSTOR	Delayed Decontamination/Dismantlement Decommissioning Option
SAR	Safety Analysis Report
SEOC	State Emergency Operations Center
SFSC	Spent Fuel Shipping Cask
TEDE	Total Effective Dose Equivalent
TLD	Thermoluminescent Dosimeter
TRU	Transuranic Waste
TS	Technical Specifications
TSCA	Toxic Substances Control Act
TSC	Technical Support Center
UMTRAP	Uranium Mill Tailings Remedial Actions Project
WBS	Work Breakdown Structure
WITS	Waste Inventory Tracking System
WSEG	Westinghouse Scientific Ecology Group

COMMONLY REFERENCED ISOTOPES AND ELEMENTS

Boron	B
Calcium	Ca-41, Ca-45
Carbon	C-14
Cesium	Cs-134, Cs-137
Cobalt	Co-60
Dysprosium	Dy
Europium	Eu-152, Eu-154
Fluorine	F
Germanium	Ge
Helium	He
Iodine	I-129, I-131
Iron	Fe-55, Fe-59
Krypton	Kr-90
Lithium	Li-6, Li-7
Manganese	Mn-54
Nickel	Ni-63, Ni-59
Niobium	Nb-94
Silver	Ag-110m
Strontium	Sr-90
Tellurium	Te-127m
Tritium	H-3
Xenon	Xe-137

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SECTION 1
SUMMARY OF PLAN

1.1 DESCRIPTION OF DECOMMISSIONING PLAN AND DECOMMISSIONING ALTERNATIVE

1.1.1 Introduction

By letter to the Nuclear Regulatory Commission (NRC) dated December 5, 1988 (Ref. 1), Public Service Company of Colorado (PSC) notified the NRC that "based on economic considerations associated with the ongoing operating costs of Fort St. Vrain, PSC has determined that it will be necessary to terminate Fort St. Vrain operations early." At that time, PSC began decommissioning planning to support premature decommissioning, resulting in submittal of the Preliminary Decommissioning Plan to the NRC on June 30, 1989. (Ref. 2)

This Proposed Decommissioning Plan is submitted by PSC in accordance with the requirement of 10 CFR 50.82(a), which requires submittal of the Proposed Decommissioning Plan *"within two years following permanent cessation of operations."* PSC previously provided a target date of October 31, 1990, for submittal of the Proposed Decommissioning Plan.

The Proposed Decommissioning Plan represents a departure from PSC's Preliminary Decommissioning Plan (Ref. 2) in that, after consideration of financial risks, regulatory environment, and uncertainty of other issues, PSC has selected the DECON alternative for immediate dismantlement and decommissioning of Fort St. Vrain.

Through a competitive bid process, PSC has selected a team headed by the Westinghouse Electric Corporation to carry out the decommissioning of Fort St. Vrain on a fixed price basis. Coincident with decommissioning, the Fort St. Vrain plant may be converted to a fossil-fueled facility (See Section 5.5).

1.1.2 Background

Fort St. Vrain was shutdown on August 18, 1989. On August 29, 1989, the PSC Board of Directors reviewed and confirmed the Executive Management decision that Fort St. Vrain would not be restarted, and that PSC would pursue the decommissioning of Fort St. Vrain.

The decision to permanently shut down and decommission Fort St. Vrain was based on related technical and financial considerations. Problems were identified with the control rod drive assemblies and

the steam generator steam ring headers that presented significant technical obstacles which could be overcome, but at significant cost in dollars and time to PSC. Additionally, due to the uniqueness of the one-of-a-kind High Temperature Gas-Cooled Reactor (HTGR) fuel cycle, the cost to purchase new fuel was prohibitive. This, in conjunction with low plant availability and correspondingly high operating costs, made continued operation of Fort St. Vrain imprudent.

Coupled with these technical and fuel cycle considerations, Fort St. Vrain had previously been removed from the rate base as a result of a 1986 Settlement Agreement between PSC, the Colorado Public Utilities Commission (CPUC), the Office of Consumer Counsel (OCC) and other parties. With the exception of limited funds to be collected for decommissioning, the removal of Fort St. Vrain from the regulatory rate base left PSC shareholders responsible for further operating and decommissioning costs of Fort St. Vrain.

1.1.3 Contents of the Proposed Decommissioning Plan

The Proposed Decommissioning Plan has been prepared to be responsive to the requirements of 10 CFR 50.82(b) and the guidance of Draft Regulatory Guide DG-1005 "Standard Format and Content for Decommissioning Plans for Nuclear Reactors" (Ref. 3). The following is a brief summary of the sections contained within this plan.

Section	Description
1	"Summary of Plan" provides a brief description of the proposed plan and background information related to the decision to decommission Fort St. Vrain. Information is provided to describe the major activities involved in the dismantlement and decommissioning of Fort St. Vrain, and the projected project schedule. The cost to decommission Fort St. Vrain is identified, as well as status of the availability of funding. Details are provided in Section 1.4 on implementation and administration of the proposed plan. Section 1.5 describes the controls which will be effective during the transition period prior to approval of the Proposed Decommissioning Plan.
2	"Choice of Decommissioning Alternative and Description of Activities" identifies the selected decommissioning alternative. Section 2.2 provides a description of Fort St. Vrain and identifies major site factors, and identifies contaminated or activated structures and components which

Section	Description
2 (cont.)	will be removed during decommissioning. The major decommissioning activities, schedule and exposure estimates are provided in Section 2.3. Organizational structures are provided for the PSC organization (Section 2.4) and the selected contractor (the Westinghouse team, Section 2.6). Decommissioning training requirements are identified in Section 2.5.
3	"Protection of Occupational and Public Health and Safety" describes the "as-is" radiological status of the Fort St. Vrain facility (Section 3.1). The decommissioning radiation protection organization is described in Section 3.2, and proposed methods of managing radioactive waste, including offsite transportation and disposal, are discussed in Section 3.3. The analysis of postulated bounding decommissioning accidents is provided in Section 3.4.
4	"Final Radiation Survey Plan" provides the purpose, criteria, and methodology that will be used to formulate the final radiation survey plan, including instrumentation, documentation and quality assurance requirements, and eventual site closure.
5	"Decommissioning Fixed Price and Funding Plan" provides a description of the decommissioning fixed price contract, major assumptions and bases used to derive the decommissioning cost, tables containing a breakdown of the decommissioning cost, and status of decommissioning funding. Provisions are also identified for updating both the decommissioning cost and the funding plan.
6	"Decommissioning Technical and Environmental Specifications" provides the methodology and philosophy that will be used to develop the decommissioning technical specifications. These specifications will be submitted to the NRC in the near future.
7	"Decommissioning Quality Assurance Plan" provides the QA plan which will be effective during decommissioning.
8	"Decommissioning Access Control Plan" identifies those access control requirements to be administered during the decommissioning process once all spent fuel has been removed from the Protected Area. This access control plan will

Section	Description
8 (cont.)	replace the existing physical security plan during the decommissioning period.
9	"Decommissioning Emergency Response Plan" provides an overview of the basis for emergency response during the decommissioning process. Accidents evaluated in Section 3.4 will be used as the basis for this plan, which will be submitted to the NRC at a future date.
10	"Decommissioning Fire Protection Plan" provides an overview of fire protection provisions which will remain in effect during decommissioning. Accidents evaluated in Section 3.4 are the basis for this section also, and a separate Decommissioning Fire Protection Plan will be submitted to the NRC at a future date.

Appendix I, "Westinghouse Team Scope of Work", provides a detailed description of the proposed Westinghouse team decommissioning and dismantlement activities. Appendix II, "Fort St. Vrain Activation Analysis", provides the results of the analysis to identify activation levels and isotopes for Fort St. Vrain components.

1.2 MAJOR TASKS, SCHEDULES AND ACTIVITIES

1.2.1 Description of Major Activities

The major dismantlement and decontamination activities to be performed during decommissioning are described in detail in Section 2.3. The decommissioning project is divided into three major work areas:

1. Decontamination and dismantlement of the PCRV.
2. Decontamination and dismantlement of the contaminated balance of plant (BOP) systems.
3. Site cleanup and final site radiation survey

Site cleanup is described in Section 2.3 and the final site radiation survey is described in Section 4.

1.2.2 Site Final Release Criteria

The release of the site, facilities and materials will be based on proper application of release criteria for surface contamination, soil/water concentrations and exposure rates. Criteria for both loose and fixed surface contamination to allow release for unrestricted use have been established in Regulatory Guide 1.86 "Termination of Operating Licenses for Nuclear Reactors" (Ref. 4). Additional interim NRC guidance has been provided which directs licensees to use a limit of 5 microR/hr above background (at one meter) for reactor-generated gamma-emitting isotopes.

PSC has committed to comply with Reg. Guide 1.86 and interim NRC guidance when decontaminating the Fort St. Vrain site, to allow release of the site for unrestricted use and eventual termination of the 10 CFR 50 license. All decommissioning activities, schedules, and costs or fixed prices are based on decontamination to the above limits.

1.2.3 Decontamination and Dismantlement of the PCRV

The major decommissioning task is the dismantlement and decontamination of the radioactive portions of the Prestressed Concrete Reactor Vessel (PCRV). Section 2.3 provides a comprehensive description of the steps necessary to dismantle and decontaminate the PCRV. PCRV dismantlement activities will begin only after all spent fuel has been removed from the Reactor Building.

PSC and the Westinghouse team have evaluated technical options available for dismantling radioactive portions of the PCRV, and a decision has been made that the best technical approach is to flood the PCRV with water, and perform the majority of dismantlement activities submerged. This will allow the most direct access to highly radioactive portions of the PCRV, while affording the maximum shielding benefit.

The description and sequence of major activities associated with PCRV dismantlement is described in Section 2.3.

1.2.4 Decontamination and Dismantlement of Contaminated Balance of Plant Systems

For the purposes of this Proposed Decommissioning Plan, balance of plant systems refer to those contaminated or potentially contaminated plant systems outside the PCRV. Decontamination and dismantlement of contaminated or potentially contaminated balance of plant systems will be performed by one of the following approaches: (1) decontamination in place, (2) removal and decontamination, or (3) removal and disposal as radioactive waste. Systems which are contaminated or potentially contaminated above releasable limits requiring decontamination and dismantlement are described in Section 2.3.

1.2.5 Schedule for Decommissioning Activities

The schedule for decommissioning activities is provided in Section 2.3.5.2 and Figure 2.3-16. The Decommissioning Planning Phase has already commenced, and will be an estimated 18 months in duration, consisting of initial site characterization, preparation of work scope planning, work specifications and procedures, and equipment and material staging.

The Decontamination and Dismantlement Phase is estimated to be 39 months in duration, and is scheduled to commence after (1) NRC approval of the Proposed Decommissioning Plan and (2) completion of defueling. Some component removal activities will be conducted prior to commencement of the Decontamination and Dismantlement Phase, as described in Section 1.5.

Decommissioning of Fort St. Vrain, including site cleanup and final site radiation survey, is expected to be completed by April 1995.

1.3 FINAL COST AND AVAILABILITY OF FUNDS

1.3.1 Decommissioning Cost

Through the competitive bid process described in Section 5.1, PSC selected, from among four qualified bidders, a project team of Westinghouse and MK-Ferguson as its decommissioning contractor.

The competitive bid submitted by the Westinghouse team, together with an estimate of PSC decommissioning costs, results in a total decommissioning cost of $137,129,000 based on the anticipated year of expenditure (inclusive of escalation). Of this amount, the Westinghouse team's firm fixed price is $100,460,000. PSC's costs, as overall project manager and licensing coordinator, are estimated to be $36,669,000. Assumptions used as the basis for these costs are identified in Section 5.3. The proposed Westinghouse team Scope of Work is provided in Appendix I.

The use of a firm fixed price contract greatly reduces the level of uncertainty in the decommissioning cost. Additionally, receiving bids from four qualified bidders is equivalent to receiving four independent cost estimates, each utilizing a different decommissioning methodology, which exceeds any NUREG evaluation and is beyond that required by the Decommissioning Rule. Use of this competitive bid process and responses received from the qualified bidders has increased PSC's confidence that the entire scope of the decommissioning has been identified and included in the decommissioning work scope. Therefore, based on discussions provided in Section 5, PSC is confident that the Westinghouse team fixed price is sufficient and all major tasks have been identified and included in this plan.

1.3.2 Decommissioning Funding Plan

As of September 30, 1990, the Fort St. Vrain decommissioning trust fund balance was approximately $19.8 million. Under terms of the 1986 Settlement Agreement, funds in the amount of approximately $2.5 million remain to be collected from PSC customers by the end of 1991.

A final decision has not been made on the funding plan for Fort St. Vrain decommissioning. Section 5.5 provides a discussion on possible decommissioning funding alternatives being pursued by PSC and commits PSC to notify the NRC of the projected funding plan once ongoing funding alternatives are finalized.

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1.4 REGULATORY BASIS FOR ADMINISTRATION OF THE PROPOSED DECOMMISSIONING PLAN

This Proposed Decommissioning Plan has been prepared and submitted to be responsive to the requirements of 10 CFR 50.82 and the guidance of Draft Regulatory Guide DG-1005, "Standard Format and Content for Decommissioning Plans for Nuclear Reactors" (Ref. 3). The Proposed Decommissioning Plan is intended to govern the entire Fort St. Vrain decommissioning effort, and is to be maintained current as described in this section, if and when the need for plan changes occur. This plan is to be a key component of the licensing basis of Fort St. Vrain during decommissioning as described below.

The following documents shall constitute the decommissioning licensing basis of Fort St. Vrain, effective following the removal of all nuclear fuel from the Fort St. Vrain Reactor Building and receipt of NRC approval to commence decommissioning:

1. This NRC-approved Proposed Decommissioning Plan including:
   a. Applicable NRC decommissioning regulations as identified in this plan, and
   b. NRC regulatory guidance applicable to the decommissioning of Fort St. Vrain as identified in this plan.
2. The NRC approved Fort St. Vrain 10 CFR 50 license and the Decommissioning Technical Specifications.
3. Licensing basis correspondence between the NRC and PSC related to the decommissioning of Fort St. Vrain.

This Proposed Decommissioning Plan, following its approval by the NRC and the removal of all nuclear fuel from the Fort St. Vrain Reactor Building, shall supersede and replace the Fort St. Vrain Updated Final Safety Analysis Report (UFSAR, Ref. 5). Following the completion of defueling, the final revision of the Fort St. Vrain UFSAR then in effect shall be retained as an historical document only, and all of the operational descriptions and commitments therein shall be superseded in their entirety by this Proposed Decommissioning Plan. Essential safety features and functions which will be relied upon during decommissioning are described and included in this plan.

For the purposes of the Fort St. Vrain plant decommissioning, the provisions of 10 CFR 50.59 and 10 CFR 50.71(e) shall apply to and be implemented by this Proposed Decommissioning Plan and the Decommissioning Technical Specifications. Any Proposed Decommissioning Plan change or activity which involves an unreviewed

safety question as defined in 10 CFR 50.59 or requires a change to the Decommissioning Technical Specifications shall require approval by the NRC prior to implementation.

Any Proposed Decommissioning Plan changes or activities that do not involve an unreviewed safety question and do not require a Decommissioning Technical Specification change, as determined by performing a 10 CFR 50.59 safety evaluation, may be implemented by PSC without prior NRC approval. An annual report shall be submitted to the NRC per the provisions of 10 CFR 50.59 describing all Proposed Decommissioning Plan changes made under the provisions of 10 CFR 50.59 and the results of the associated 10 CFR 50.59 safety evaluation.

Likewise, Proposed Decommissioning Plan updates shall be submitted to the NRC at least annually per the provisions of 10 CFR 50.71(e). This annual Proposed Decommissioning Plan update shall be current as of six months prior to the submittal date.

The following plans, which require NRC approval for decommissioning and constitute a part of this Proposed Decommissioning Plan, shall be administered under the applicable provisions of the regulations as described in following Proposed Decommissioning Plan (PDP) sections:

PLAN	APPLICABLE REQUIREMENTS/PDP SECTION
Quality Assurance Plan(2)	10 CFR 50.54(a), 10 CFR 50 Appendix B, and 10 CFR 71 Subpart H as described in PDP Section 7
Access Control Plan(2)	PDP Section 8
Decommissioning Emergency Response Plan(1)	PDP Section 9
Fire Protection Plan(1)	10 CFR 50.48(a) and 10 CFR 50 Appendix A Criterion (3), as described in PDP Section 10
Final Radiation Survey Plan(2)	10 CFR 50.82(b)(3) as described in PDP Section 4
Decommissioning Funding Plan(1)	10 CFR 50.82(b)(4) as described in PDP Section 5

<u>Notes:</u>

(1) Plans which will be submitted to the NRC for approval separate from this Proposed Decommissioning Plan.
(2) Plans which are included in this Proposed Decommissioning Plan for NRC review and approval.

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1.5 DECOMMISSIONING CONTROLS DURING THE TRANSITION PERIOD PRIOR TO APPROVAL OF THE PROPOSED DECOMMISSIONING PLAN

1.5.1 Introduction

This section describes the decommissioning controls that will apply to plant closure activities during the transition to the Decommissioning Technical Specifications (DTS) and the Proposed Decommissioning Plan (PDP) controls.

The decommissioning of Fort St. Vrain (FSV) involves many planning and preparatory activities that will be performed prior to approval of the PDP. The requirements and controls that govern these plant closure activities are contained largely in the operational Technical Specifications (TS) and in 10 CFR 50.59.

The Fort St. Vrain 10 CFR 50 license includes controls in the TS which are an appendix to the license. The Administrative Controls in the TS will remain generally unchanged until the DTS (see Section 6.1) are approved and implemented. Pending NRC approval, the DTS may be implemented concurrent with the PDP approval or it may occur at a later time. Decommissioning activities, therefore, may have to be initiated under the then current TS controls.

Decommissioning shall be considered to begin with the first physical activity to remove contaminated equipment from Fort St. Vrain, after all fuel has been removed from the Reactor Building and after NRC approval of the PDP. Activities performed prior to NRC approval of the PDP are considered plant closure activities, in preparation for decommissioning.

In Reference 6, the NRC stated that a licensee must: (1) comply with the requirements of its operating license and the regulations applicable to whatever mode or condition the plant might be in at a given time; and (2) refrain from taking any actions that would materially and demonstrably affect the methods or options available for decommissioning, or that would substantially increase the costs of decommissioning, prior to NRC approval of a decommissioning plan.

Fort St. Vrain is permanently shut down, cooled down and depressurized. Under these plant conditions, PSC considers that performing plant closure activities is within existing licensee authority provided they do not require a change to the Fort St. Vrain Technical Specifications or 10 CFR 50 license, do not involve an unreviewed safety question as defined in 10 CFR 50.59, do not limit the choice of reasonable decommissioning alternatives (i.e., SAFSTOR, DECON, or ENTOMB), and do not substantially increase the costs of FSV decommissioning. PSC will

not consider resumed operation as an option during the review of contemplated component removal and disposal activities (e.g., region constraint devices and helium circulators). Other plant closure activities that are not within existing licensee authority will be submitted for NRC approval, prior to their accomplishment. PSC considers these actions to be fully in compliance with applicable regulations and license requirements.

1.5.2 Component Removal Activities

Prior to the initiation of actual decommissioning activities, PSC may complete the removal of numerous components from the PCRV, including the helium circulators, control rod drive and orifice assemblies (CRDOAs), metal clad reflector blocks (MCRBs) and the region constraint devices (RCDs). These activities are performed as plant closure activities, outside the scope of the Proposed Decommissioning Plan. Some of these components may be removed prior to the completion of defueling, if the components have no required nor useful function during any planned or postulated defueling or shutdown conditions. In addition, several component removal activities may be performed in the interest of technology transfer with the Department of Energy (DOE), including removal of a steam generator ring header and bimetallic weld sample(s), and removal of high temperature helium purification system components.

Other plant closure activities beyond the scope of the Proposed Decommissioning Plan are evaluated against the following criteria:

1. If the activity requires a change to the Fort St. Vrain Technical Specifications or involves an unreviewed safety question, as determined by a safety evaluation performed in accordance with the provisions of 10 CFR 50.59, prior NRC approval must be obtained.

2. If the activity has an adverse environmental impact, in that it disturbs environs not previously disturbed during plant construction or operation, prior NRC approval must be obtained.

3. If the activity precludes any of the allowable decommissioning alternatives (SAFSTOR, DECON, or ENTOMB), prior NRC approval must be obtained.

4. If the activity involves any significant increase in the total radiation exposure required for decommissioning, to the extent that a revision to the Proposed Decommissioning Plan is required, prior NRC approval must be obtained.

1.5.3 Transition to Decommissioning Controls

After all nuclear fuel has been removed from the Reactor Building, the controls on plant closure activities will not be needed to ensure the safety of the core, but they will be needed to minimize radiological exposure to workers and the public, and to protect against an unplanned release of radioactivity to the environs. Fort St. Vrain will maintain its 10 CFR 50 license, and regulations such as 10 CFR 50.59 will still apply.

The transition to decommissioning controls will be relatively smooth because many of the existing requirements will continue to apply, although various details may differ considerably. Facility modifications that involve a change to the PDP will be reviewed pursuant to 10 CFR 50.59. The DTS will include Administrative Controls, such as organizational requirements, a safety review committee, procedural requirements, record keeping requirements, and reporting requirements.

Upon NRC approval of the PDP, decommissioning controls will be phased-in in a controlled manner, as follows:

1. Surveillances and preventive maintenance activities for equipment no longer required to be operable will be suspended.

2. New decommissioning design controls may be implemented which will incorporate revised requirements for 10 CFR 50.59 evaluations and configuration management.

3. Procedures that are no longer needed will be deleted or placed in a category which requires no additional maintenance of the procedure.

4. Procedures that relate to radioactive effluent controls will be retained until the DTS are issued. At that time, they will be revised as necessary to reflect the requirements of the Off Site Dose Calculation Manual and the Process Control Program.

5. After approval of the DTS, implementing procedures will be revised accordingly.

1.5.4 Mobilization Activities

In preparation for the actual start of decommissioning activities, it may be desirable to install certain equipment items such as material handling and water purification equipment prior to formal approval of the PDP.

These mobilization activities may be performed while there is still nuclear fuel being removed from the Reactor Building, provided each activity is evaluated for its impact on the defueling operation. Also, any physical modifications to an existing Fort St. Vrain system (e.g., piping connections, power connections) will be treated in accordance with the then current Fort St. Vrain Quality Assurance Plan.

1.6 REFERENCES FOR SECTION 1

1. PSC Letter, R.O. Williams (PSC) to J. Calvo (NRC), dated December 5, 1988; Subject: "Early Termination of Fort St. Vrain Operations", (P-88422).

2. PSC Letter, A.C. Crawford (PSC) to NRC, dated June 30, 1989; Subject: "Fort St. Vrain Preliminary Decommissioning Plan", (P-89228).

3. Draft Regulatory Guide DG-1005 "Standard Format and Content for Decommissioning Plans for Nuclear Reactors" (For Comment), September, 1989.

4. USAEC Regulatory Guide 1.86 "Termination of Operating Licenses for Nuclear Reactors", June 1974.

5. Fort St. Vrain Updated Final Safety Analysis Report, Rev. 8, dated July 22, 1990.

6. NRC Memorandum and Order, CLI-90-08, dated October 17, 1990.

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SECTION 2

CHOICE OF DECOMMISSIONING ALTERNATIVE AND DESCRIPTION OF ACTIVITIES

2.1 DECOMMISSIONING ALTERNATIVE

PSC has selected the DECON option for decommissioning Fort St. Vrain. PSC's objective is the immediate dismantlement and decommissioning (DECON) of the Fort St. Vrain Nuclear Generating Station to release all site areas for unrestricted use. To accomplish this objective, the following activities will be accomplished:

1. Remove the PCRV internal radioactive components remaining after completion of defueling.
2. Decontaminate and/or dismantle those portions of the PCRV structure and radioactive balance-of-plant systems which exceed limits for unrestricted release of residual radioactive materials.
3. Ship all radioactive waste offsite for disposal.
4. Perform a final site radiation survey to confirm that all site areas can be released for unrestricted use.
5. Terminate the 10 CFR 50 license.

Fort St. Vrain will be decontaminated to levels which meet the criteria of USAEC Regulatory Guide 1.86 "Termination of Operating Licenses for Nuclear Reactors" (Ref. 1) and NRC interim guidance identified in Section 4.2.

It is expected that PSC will operate and maintain Fort St. Vrain under a 10 CFR 50 Possession Only License during decontamination and dismantlement activities. Once decontamination and dismantlement activities are completed and a final site survey has been performed to confirm site release for unrestricted use, PSC will apply to the NRC to terminate the 10 CFR 50 license.

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2.2 FACILITY DESCRIPTION

2.2.1 General Description

Fort St. Vrain is a High Temperature Gas-Cooled Reactor (HTGR) owned and operated by PSC. Fort St. Vrain's location is approximately 35 miles north of Denver and three and one-half miles northwest of the town of Platteville in Weld County, Colorado.

The site consists of 2798 acres owned by PSC. During the plant operation, approximately one mile square within the site area was designated as the exclusion area, and the licensee maintained complete control over this area. The completed facility is shown in Figure 2.2-1. The basic installation consists of a Reactor Building, a Turbine Building, cooling towers, and an electrical switchyard.

2.2.1.1 Reactor Building

The Reactor Building (Figures 2.2-2 and 2.2-3) houses the prestressed concrete reactor vessel (PCRV), fuel handling area, fuel storage wells (FSWs), fuel shipment preparation facilities, decontamination and radioactive liquid and gas waste processing equipment, and most reactor plant process and service systems. The building is able to withstand wind loadings developed by a 100 mph wind or a tornado of 202 mph total horizontal wind velocity without exceeding yield stresses.

The PCRV and nuclear steam supply system (NSSS) are located in the west portion of the Reactor Building. The east portion of the Reactor Building houses auxiliary and support systems and facilities such as the FSWs, the hot service facility (HSF), the equipment storage wells (ESWs), storage and laydown areas for various pieces of equipment, radioactive gas and liquid waste storage facilities, and the loading ports for the spent fuel shipping casks (SFSC).

The basement area of the Reactor Building contains the building sump/keyway. The volume of the sump/keyway is approximately 44,600 cubic feet.

The Fort St. Vrain Reactor Building is presently designed to withstand the Design Basis Earthquake (DBE) of 0.10 g horizontal ground acceleration at the site without unsafe damage or failure to function. During decommissioning, the Reactor Building will continue to be required to perform its confinement function following a seismic event.

The decommissioning of Fort St. Vrain will not involve any major modifications to the Fort St. Vrain Reactor Buildir without verification of the seismic qualification. Other than tne Reactor Building, no additional seismic analysis of individual decommissioning tasks and removal activities will be required.

2.2.1.2 Turbine Building

The Turbine Building (Figures 2.2-2 and 2.2-3) houses the turbine generator with condensing, feedwater, and other auxiliary systems. Included in the Turbine Building is an auxiliary bay area housing the reactor plant ventilation equipment, the controlled personnel access to the Reactor Building, and an area housing the control room and miscellaneous electrical services. The Turbine Building also houses a service and office area which provides space for miscellaneous shops, auxiliary steam system components, and administrative offices.

2.2.1.3 Fuel Storage Building

The Fort St. Vrain Fuel Storage Building is a single level concrete structure located east of the Reactor Building (see Figure 2.2-4). The building is constructed of prestressed concrete panels and twin tees, and is designed to withstand a 202 mph tornado wind and can withstand the design basis tornado missile. This building will be used for decommissioning support.

2.2.2 Prestressed Concrete Reactor Vessel (PCRV) and Internal Components

The PCRV (Figures 2.2-5 and 2.2-6), which contains the NSSS, is a reinforced concrete structure prestressed with steel tendons. Following defueling, the PCRV will contain the majority of the remaining radioactive materials in the Reactor Building.

The Fort St. Vrain systems associated with the PCRV are as follows:

System 11	PCRV and Internal Components
System 12	Control Rod Drive and Orifice Assembly
System 17& System 18	Reactor Reflector and Defueling Elements
System 21	Helium Circulators
System 22	Steam Generators
System 23	Helium Purification System

These systems make up the primary reactor vessel and internal core components located within the PCRV. These systems and components are discussed further in this section and in Section 2.3.

Portions of the PCRV concrete and rebar are expected to remain activated due to direct irradiation from the reactor core. Highly radioactive components will remain inside the PCRV until removed during PCRV decontamination and dismantlement.

Physically, the 15-1/2 foot thick heads and the 9 foot thick concrete walls are constructed around a 3/4-inch thick low-carbon steel liner which forms the internal cavity. The liner is anchored to the concrete at frequent intervals. A core support floor (CSF) is provided within the PCRV in the form of a reinforced 5 foot thick concrete disk with a 3/4-inch carbon steel outer liner, supported by 12 steel core support floor columns from the bottom of the PCRV cavity.

Longitudinal, circumferential and top and bottom crosshead prestressing tendons (448 total) are located in conduits embedded in the PCRV concrete. Tendons are positioned both circumferentially and vertically along the PCRV side walls. There are also tendons across the top and bottom heads in a criss-cross arrangement.

The reactor core arrangement within the PCRV is shown in Figure 2.2-7. The top layer of the core arrangement consisted of hexagonally shaped metal clad reflector blocks (MCRBs) with openings for 37 control rod pairs. The MCRBs provided an inlet plenum for the reactor coolant to the active core. Region constraint devices (RCDs) were located on top of the MCRBs and mechanically interlocked the top layer (not shown on Figure 2.2-7). Hexagonal top reflector elements with coolant channels are located directly below the MCRBs and above the active core region.

The active core was divided into 37 regions and consisted of 1482 fuel elements. Individual fuel elements were hexagonal in cross section and aligned with the coolant channels from the reflector elements and MCRBs. During reactor defueling, the fuel elements are being replaced with defueling elements of identical shape and size. Hexagonal reflector elements are also located to the sides of and below the active core region. Many of the bottom reflector elements contain boronated graphite in Hastelloy cans.

Radially outside of and immediately adjacent to the top, side and bottom hexagonal reflector elements are the large irregular-shaped side reflector blocks. Between the side reflector blocks and the

core barrel are the boronated side reflector spacer blocks that contain boronated steel pins and were used for shielding.

Immediately outboard of the core barrel is a helium interspace area. Outboard of this interspace area is an outer metal insulation cover plate, Kaowool (thermal) insulation, an inner metal insulation cover, another layer of Kaowool, and then the PCRV carbon steel liner. See Figure 2.2-8 for a general arrangement of the thermal barriers.

Below the core region containing the defueling elements, the CSF will bear the weight of the defueling elements and reflectors through the core support posts and the core support blocks. The CSF also is the bottom termination point of the core barrel and has 12 penetrations for the 12 steam generator modules. The CSF is supported from the bottom head of the PCRV with 12 core support floor columns (See Figure 2.2-9).

The lower plenum is below the CSF and houses the steam generator modules (12), circulator diffusers (4), circulators (4) the CSF support columns (12) and the lower floor. A number of instrument and equipment penetrations and wells exist in the PCRV heads and sidewalls.

2.2.3 Balance of Plant Contaminated Components

The following is a list of the systems that are considered to be the potentially contaminated balance of plant systems outside of the PCRV at Fort St. Vrain:

System 13	Fuel Handling Equipment
System 14	Fuel Storage Facility
System 16	Auxiliary Equipment
System 21	Helium Circulator Auxiliaries
System 23	Helium Purification Auxiliaries
System 24	Helium Storage System
System 46	Reactor Plant Cooling Water System
System 47	Purification Cooling Water System
System 61	Decontamination System
System 62	Radioactive Liquid Waste System
System 63	Radioactive Gas Waste System
System 72	Reactor Building Drain System
System 73	Reactor Building Ventilation System
System 93	Instrumentation and Controls

System 15, fuel and reflector shipping equipment, consists primarily of the shipping casks, truck-trailers, spent fuel container, and cask lifting apparatus and is not a part of the decommissioning project. These equipment items will be retained under their separate 10 CFR 71 license or will be disposed of at some time in the future.

A brief summary of the major components in each of the above balance of plant contaminated systems is as follows:

2.2.3.1 System 13 - Fuel Handling Equipment

The fuel handling equipment that remains contaminated includes the fuel handling machine (FHM, Figure 2.2-10), four reactor isolation valves (Figure 2.2-11) and two refueling sleeves (Figure 2.2-12).

2.2.3.2 System 14 - Fuel Storage Facility

The fuel storage facility (See Figure 2.2-13) consists of nine fuel storage wells constructed of carbon steel tank structures.

2.2.3.3 System 16 - Auxiliary Equipment

The auxiliary equipment consists of the Auxiliary Transfer Cask (ATC, Figure 2.2-12), ten ESWs (Figure 2.2-14), the HSF (Figure 2.2-15), and three shielding adapters (Figure 2.2-16).

The ATC is most commonly used to transfer the control rod drive assemblies, refueling sleeves and the shield plugs. The ten ESWs are carbon steel structures embedded in concrete used to store the control rod drive assemblies and the refueling sleeves. The HSF, constructed of concrete and steel shielding plates, consists of two work areas used for inspection, repair, maintenance, testing and decontamination work.

Figure 2.2-16 shows a general layout at the location of the various fuel handling and storage system components, and associated auxiliary equipment on the refueling floor.

2.2.3.4 System 21 - Helium Circulator Auxiliaries

The auxiliary equipment for System 21 was used to provide a supply of high pressure water for the helium circulator bearing lubrication and a supply of purified buffer helium to prevent in-leakage of bearing water into the primary coolant. The major equipment items include buffer helium recirculators, heat exchangers, filters,

pumps, helium dryers, chemical injection components, containment tanks, and compressors (See Figure 2.2-17).

2.2.3.5 System 23 - Helium Purification Auxiliaries

The System 23 auxiliary equipment was used to assist in purification of the helium used as the primary reactor coolant. The major equipment items include filters, heat exchangers, compressors, and dryers (See Figure 2.2-18).

2.2.3.6 System 24 - Helium Storage System

The primary purpose of the helium storage system was to provide for both storage and transfer of helium from the reactor vessel and the storage tanks. In addition, the helium storage system was used in testing the control rod reserve shutdown system and for various FHM purging operations. The primary equipment items include a helium transfer compressor, storage tanks, surge tank, oil adsorber, and high pressure helium supply tanks (See Figure 2.2-19).

2.2.3.7 System 46 - Reactor Plant Cooling Water System

The reactor plant cooling water system (Figure 2.2-20) provides cooling water for process heat removal from all auxiliary equipment in the reactor plant. Three loops are provided that form the PCRV circuit (liner cooling tubes), the PCRV auxiliary circuit (closed loop for various systems/components) and the service water circuit (open loop for various systems/components). The major equipment items include surge tanks, pumps, demineralizers, filters, heat exchangers, chemical injection (tank and pump) and recondenser chiller.

2.2.3.8 System 47 - Purification Cooling Water System

The purification cooling water system (two loops) provides cooling water to the helium purification system heat exchangers. The major components are pumps, expansion tanks, exchangers and associated piping (See Figure 2.2-21).

2.2.3.9 System 61 - Decontamination System

The major equipment items include a water heater, a drying air heater, a filter, pumps,a solution tank and a chemical injection system (See Figure 2.2-22).

2.2.3.10 System 62 - Radioactive Liquid Waste System

The major equipment items in this system include a waste sump (1000 gallon tank), pumps, filters, two 3000 gallon receiver tanks, two demineralizers and a 3000 gallon waste monitor tank (See Figure 2.2-23).

2.2.3.11 System 63 - Radioactive Gas Waste System

The major equipment items in this system include pre-filters, filters, exhaust blowers, tanks (vacuum, surge, and drain), and compressors (See Figure 2.2-24).

2.2.3.12 System 72 - Reactor Building Drain System

The Reactor Building drain system collects the liquid effluent from various equipment and piping drains for appropriate disposal. The major equipment items include drain tanks, sump, pumps, piping and filters (See Figure 2.2-25).

2.2.3.13 System 73 - Reactor Building Ventilation System

The Reactor Building HVAC system ventilates various areas of the Reactor Building with heated or cooled air. All ventilation air, whether outdoor or recirculated, is filtered before distribution. In addition, the reactor plant HVAC system maintains building pressure differential control and collects radioactive leakage to minimize exposure of personnel to airborne contamination. As shown in Figure 2.2-26, this system consists of several air handling units and filters. The only part of the system considered to contain possible contamination is the reactor vent exhaust system. The reactor plant exhaust filters are composed of banks of moisture separators, HEPA filters and charcoal absorbers. Each bank contains 16 individual HEPA elements.

2.2.3.14 System 93 - Instrumentation and Control

The portions of the instrumentation and control system that are of interest are the moisture monitors and the area radiation monitors.

2.2.4 Site Characteristics

2.2.4.1 Demography

The population density in the rural areas surrounding the site is relatively low. The nearest resident is located approximately

one-half mile north of the Reactor Building, with the nearest town of Platteville located approximately 3-1/2 miles southeast. This is well outside the proposed EPZ of 100 meters from the Reactor Building. The population of Platteville, based on preliminary 1990 census figures, is 1515. The nearest population centers with a population over 25,000 are Greeley (60,399), Longmont (51,288), and Loveland (37,173), all based on preliminary 1990 census figures.

2.2.4.2 Geography and Land Use

The site is located in Weld County, Colorado. The area surrounding the site is shown in Figure 2.2-27 with reference circles of 10, 20 and 30 miles radii. The site is located in the South Platte River Valley, approximately thirty-five miles north of Denver. It is located in an agricultural area with gently rolling hills. Grade elevation at the plant is 4,790 feet. The foothills of the Rocky Mountains start to rise about twenty miles west of the site, and the Continental Divide is prominently identified by Long's Peak, located forty miles directly west of the site.

The South Platte River and St. Vrain Creek both pass through portions of the site. These two streams, which join near the northern tip of the site, are not large enough to be used for water transportation.

The general area and land use surrounding the site is predominantly agricultural. The major farm products include grain, feed corn, sugar beets, vegetables, beef cattle, sheep and turkeys. There is also a limited amount of dairy farming in the area.

The industrial facilities in the immediate area are primarily located in the town of Platteville. There are 14 oil/gas wells within a one mile radius of the Reactor Building on Company property.

2.2.4.3 Geology and Seismology

The geologic structure of the general area in which the site is located is shown in Figure 2.2-28. The area lies on the east flank of the Colorado Front Range which is a complexly faulted anticlinal arch on which are superimposed numerous smaller folds and faults. The rocks of the core of the anticlinal arch are Precambrian crystallines, including gneiss, schists, and quartzites which have been intruded by granitic rocks that range in age from Precambrian to Tertiary. On the east flank of the arch are Paleozoic and Mesozoic sedimentary rocks.

The regional structure of this part of Colorado is characterized by sedimentary rocks dipping eastward into the Denver Basin. Along the mountain front the regional structural pattern is interrupted by relatively small, en echelon anticlines that plunge to the southeast. In addition to the fold axes, two groups of faults have been recognized. The most notable occurs along the mountain front and includes a series of faults extending in a generally northwest-southeast direction from the Precambrian into the Paleozoic-Mesozoic sediments. The second group of faults has been recognized primarily in coal mines, located generally east of Boulder. These faults have a northeast-southwest orientation. Both groups of faults are relatively high angle faults.

The faults and the minor folds are related to the uplift of the Front Range which began in Late Cretaceous and continued into the Tertiary. The original field examination and photo interpretation of the area surrounding the site location failed to indicate any evidence of recent movement along any of the known faults. There is no known evidence of any recent seismic activity in the immediate area to have caused any subsequent movement.

The subsoils at the site are St. Vrain-Platte River alluvial sands and gravel overlying Pierre shale bedrock. Generally, 3 to 8 feet of loose to very loose clean sands (with occasional silty and clay lenses) are underlain by 30 to 35 feet of medium dense, fine alluvial sands. These sands are underlain with 4 to 11 feet of medium dense to dense, slightly clay, sandy gravel. Continuing under the gravel, hard to very hard interlayered sandstone and claystone bedrock is found at depth 46 to 51 feet. Free water was found at a depth of about 23 feet. Estimated contours of the surface of the bedrock and the free water level are shown in Figures 2.2-29 and 2.2-30. The shallow loose sands are capable of supporting only low foundation pressures, the medium dense sand will support moderate foundation pressures, and the bedrock will support high foundation pressures.

2.2.4.4 Hydrology

The site location is between the South Platte River and St. Vrain Creek about two miles south of the confluence of these two streams. Surface water rights are owned in four ditches which traverse portions of the site area. In addition, nineteen shallow wells are located on the site area.

Flow of ground water on the site is toward the alluvial deposits of both the South Platte River and St. Vrain Creek. The contours of

the water table indicate that the flow of ground water is predominately toward the South Platte River Valley (Figure 2.2-30). Much of the ground water comes from the South Platte River and St. Vrain Creek, such that the water table changes with the flow rate (elevation) in the two streams. Total precipitation, mostly in the form of rain, in the South Platte Valley is small and contributes relatively little to the ground water.

2.2.4.4.1 Plant Water Supply

When the plant was operating, cooling water for the plant was supplied by the main cooling tower and the service water tower. Make-up water for the main cooling tower was obtained from water diverted from the South Platte River and St. Vrain Creek, and supplemented by water from a system of six shallow wells. Make-up water for the service water tower is supplied by the domestic water system, with back-up from the shallow well system. Potable water and water for closed systems in the plant, such as the secondary coolant system, is supplied by the domestic water line, which is connected to a main of the local water district. The local water district is the Central Weld County Water District, whose source of supply is Colorado Big Thompson Project water from Carter Lake, which is located about twenty miles west of the site. The arrangement of the various water supply systems is shown in Figure 2.2-31.

2.2.4.4.2 Plant Effluent

Liquid effluent from the plant is discharged primarily from either the plant building drains or the cooling tower blowdown line.

Miscellaneous turbine plant drains such as floor drains, the Turbine Building sump, and yard drains, are normally directed to the South Platte River via the continuation of the Goosequill ditch to the farm pond. A diversion box is provided in the Turbine Building drain line so that effluent can normally be directed into the Goosequill ditch. Under abnormal conditions which prevent discharge via the Goosequill ditch, effluent is alternatively directed to the St. Vrain Creek via a slough. The reactor plant drains flow to a diversion box from which the flow can be directed to the South Platte River via the continuation of the Goosequill ditch or to the St. Vrain Creek via a slough.

Further downstream from the plant, the Goosequill irrigation ditch flows into the Jay Thomas irrigation ditch and the combined stream flows into a 25 acre farm pond. The overflow from the farm pond

flows into the South Platte River close to its confluence with the St. Vrain Creek. The drainage path via the Goosequill ditch and the pond is normally used.

Three lined evaporation ponds (total surface area of 3.6 acres) are present and were utilized to receive chemically treated effluent (primarily produced by periodic regeneration of plant demineralizers) while the plant was operating. Two ponds are located a few hundred feet northeast of the plant building. The other pond is located south of the switchyard.

Use of surface water downstream from the site is limited almost entirely to irrigation. A diagram of the major tributaries and irrigation ditches on the South Platte River between the gaging stations at Henderson and Kersey is shown on Figure 2.2-31. The plant site is located just upstream of the junction with the St. Vrain Creek, adjacent to the Jay Thomas Ditch.

Analyses for the reactor site were conducted on the amount of diversion and stream flows of the nearby water ways. From these original analyses, it was concluded that effluent from the plant would be carried primarily by the South Platte River except during the irrigation season with allowance for reservoir storage. Effluent in irrigation water would enter ground water in the alluvium and would eventually be transported back into the strata bed of the South Platte River. There have been no significant changes in the waterway flows or diversions to require new analyses.

The sources of public water supplies within thirty miles of the site are given in Table 2.2-1. There are two towns downstream within this radius that presently obtain part or all of their water from wells in the alluvium of the South Platte River: Gilcrest and LaSalle. It has been common practice for farmers to obtain domestic water from shallow wells in the alluvium. Many of those who formerly used shallow wells as their source of domestic water now obtain water from the Central Weld County Water District. This same district is the source of domestic water for the plant.

2.2.4.5 Meteorology

2.2.4.5.1 General Climate

The general climate around the Fort St. Vrain reactor site is typical of the Colorado eastern-slope plains region. In this semi-arid region the precipitation averages 10 to 15 inches a year, mostly from thunderstorms in late spring and summer. The annual

free water surface evaporation rate is about 45 inches per year (Ref. 2).

The wind records show no dominant direction, although winds out of the north by northeast segment do occur with the greatest frequency. The winds are generally light (10 mph), with higher velocities occurring during various atmospheric disturbances.

The weather is generally mild. Most seasons are characterized by low humidity and sunny days, with occasional, short-lived storms bringing precipitation into the area. Relative humidity averages about 40 percent during the day and 65 percent at night. Thermal radiation losses resulting from lack of cloud cover provide considerable variation in temperature from night to day. Although snowfall may be significant, the snow cover is usually melted in a few days.

2.2.4.5.2 Severe Weather

Tabulated below are temperature and precipitation records for three cities within 20 miles of Fort St. Vrain (see Figure 2.2-27). The recording periods were 1973-1988 (Brighton), 1931-1988 (Longmont), and 1967-1988 (Greeley).

	Brighton	Longmont	Greeley
Max. Temp. (degrees F)	101	106	103
Min. Temp. (degrees F)	-23	-36	-25
Max. Precip. - Day (in.)	2.73	4.04	3.20
Max Snowfall - Month (in.)	22.1	32.1	37.3

Based on information extracted from archived weather data collected from Fort St. Vrain's 60 meter meteorological tower for the period 1986 through 1989, the following weather extremes were observed:

Maximum Temperature	=	104 degrees F
Minimum Temperature	=	-26 degrees F
Maximum Wind Velocity	=	48 mph at wind direction 6.5 degrees (NNE)

Seasonally, winds tend to be strongest in the late winter and spring, the season with high chinook frequency, and again in the summer, when thunderstorms occur frequently.

Strong winds, especially under chinook conditions, have been observed on various occasions in eastern Colorado. The chinook winds are strongest immediately to the east of the mountain ridge and diminish rapidly over the plains with increasing distance from the mountains.

The measurement records at the site from July 1986 to December 1989 reveal a prevalence of northerly and southerly winds caused by the shallow depression of the St. Vrain Creek and the South Platte River and by the proximity of the Rocky Mountains. The meteorological data for this period for the wind speed and duration and frequency of distribution is contained in Tables 2.2-2 and 2.2-3, respectively.

Northeastern Colorado has moderate thunderstorm activity. The region near Fort St. Vrain averages 50 days/year in which thunder and lightning occur. The majority of these thunderstorms are present from late spring through the summer.

The Fort St. Vrain site is located in a region that typically experiences 5 tornadoes per year per 10,000 square miles. The peak tornado activity occurs in the month of June. According to the National Weather Service, 117 tornadoes occurred in Weld County during the period 1950-1987.

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TABLE 2.2-1

PUBLIC WATER SUPPLIES WITHIN THIRTY MILES OF FORT ST. VRAIN

Downstream in the Platte River Valley

Distance Miles	Municipality	Population Served	Type of Supply	Source of Supply
5-10	Gilcrest	382	Wells	Alluvium of South Platte River
10-15	LaSalle	1,300	Wells	Alluvium of South Platte River
10-20	Greeley	39,000	Surface	Cache la Poudre River; Colorado-Big Thompson Project; Nunn and Deadman Creeks

Other Municipalities

Distance Miles	Municipality	Population Served	Type of Supply	Source of Supply
1-4	Platteville	950	Wells	Alluvium
5-10	Mead	900	Surface	Big Thompson River and St. Vrain Creek
10-15	Johnstown	1,200	Surface	Big Thompson River
10-15	Fort Lupton	4,000	Wells	Alluvium of South Platte River
10-15	Frederick	1,500	Surface	Boulder Creek
10-15	Longmont	50,000	Surface	North and South St. Vrain Creek
10-20	Loveland	30,000	Surface	Big Thompson River
10-15	Berthoud	3,200	Surface	Big Thompson River
15-20	Hudson	540	Wells	Alluvium
15-20	Brighton	13,000	Wells	Alluvium of South Platte River
15-20	Erie	1,375	Surface	South Boulder Creek
15-20	Windsor	1,500	Surface	Greeley
20-25	Eaton	1,500	Wells	Alluvium
20-25	Keenesburg	475	Wells	Laramie and Fox Hills formations
20-25	Broomfield	20,000	Wells	Fox Hills sandstone
20-25	Lafayette	10,000	Surface	South Boulder Creek, Woneka Reservoir
20-25	Louisville	6,000	Surface	South Boulder Creek
20-25	Lyons	1,340	Surface	North St. Vrain Creek
20-25	Timnath	150	Surface	Greeley
20-30	Fort Collins	80,000	Surface	Cache la Poudre River
25-30	South Adams Water and Sanitary Dist. (Commerce City)	25,000	Wells	Alluvium of South Platte River
25-30	Lochbuie	1,000	Wells	Alluvium of South Platte River
25-30	North Huron Water Dist. (near Broomfield)	80	Wells	Fox Hills sandstone
25-30	Northwest Utilities Company	15,000	Wells	Arapahoe and Fox Hills formations; alluvium of South Platte River
25-30	Federal Heights	8,000	Wells	Arapahoe and Fox Hills formations
25-30	Westminster	60,000	Surface	Clear Creek Wells Arapahoe and Fox Hills formations
25-30	Boulder	96,000	Surface	North Boulder Creek
25-30	Jamestown	230	Ground	Alluvium

TABLE 2.2-2

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1986-1989
STABILITY CLASS: All Classes

Wind Direction	Wind Speed (mph) at 10m Level 1-3	4 - 7	8 - 12	13 - 18	19 - 24	>24	TOTAL
N	545.13	579.12	355.24	272.14	76.43	21.50	1849.56
NNE	738.41	729.08	420.54	217.72	72.83	25.22	2202.80
NE	803.04	964.27	353.48	101.27	19.11	3.53	2244.70
ENE	820.38	1051.09	303.93	38.20	4.26	1.26	2219.12
E	597.95	845.41	227.74	27.21	2.77	0.76	1701.84
ESE	570.52	748.32	256.38	41.60	4.52	1.51	1622.85
SE	526.77	584.33	231.54	61.27	6.04	2.77	1412.72
SSE	637.06	666.42	265.01	68.02	23.41	9.85	1669.77
S	872.38	805.30	228.23	56.06	19.41	7.31	1988.69
SSW	1072.95	937.43	120.03	23.18	2.92	2.36	2158.87
SW	1204.10	1537.78	157.65	24.11	5.54	2.27	2931.45
WSW	867.01	1113.02	166.28	62.69	11.57	6.03	2226.60
W	369.11	263.26	75.50	50.46	26.98	10.84	796.15
WNW	205.06	169.15	84.86	90.29	29.78	20.91	600.05
NW	278.20	299.73	160.76	87.95	29.96	8.83	865.43
NNW	388.84	380.16	221.87	129.06	36.58	4.28	1160.79
VARIABLE	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	10496.91	11673.87	3629.04	1351.23	371.11	129.23	27651.39

Periods of calm (hours): 1241.77

Hours of missing data: 1728.56

TABLE 2.2-3

FREQUENCY OF DISTRIBUTION FOR EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD: 1986-1989
STABILITY CLASS: All Classes

	Wind Speed (mph) at 10m Level						
Wind Direction	1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	>24	TOTAL
N	0.020	0.021	0.013	0.010	0.003	0.001	0.067
NNE	0.027	0.026	0.015	0.008	0.003	0.001	0.080
NE	0.029	0.035	0.013	0.004	0.001	0.000	0.081
ENE	0.030	0.038	0.011	0.001	0.000	0.000	0.080
E	0.022	0.031	0.008	0.001	0.000	0.000	0.062
ESE	0.021	0.027	0.009	0.002	0.000	0.000	0.059
SE	0.019	0.021	0.008	0.002	0.000	0.000	0.051
SSE	0.023	0.024	0.010	0.002	0.001	0.000	0.060
S	0.032	0.029	0.008	0.002	0.001	0.000	0.072
SSW	0.039	0.034	0.004	0.001	0.000	0.000	0.078
SW	0.044	0.056	0.006	0.001	0.000	0.000	0.106
WSW	0.031	0.040	0.006	0.002	0.000	0.000	0.081
W	0.013	0.010	0.003	0.002	0.001	0.000	0.029
WNW	0.007	0.006	0.003	0.003	0.003	0.001	0.022
NW	0.010	0.011	0.006	0.003	0.001	0.000	0.031
NNW	0.014	0.014	0.008	0.005	0.001	0.000	0.042
VARIABLE	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	0.380	0.422	0.131	0.049	0.013	0.005	1.000

Periods of calm fraction: 0.045

Fraction of missing data: 0.063

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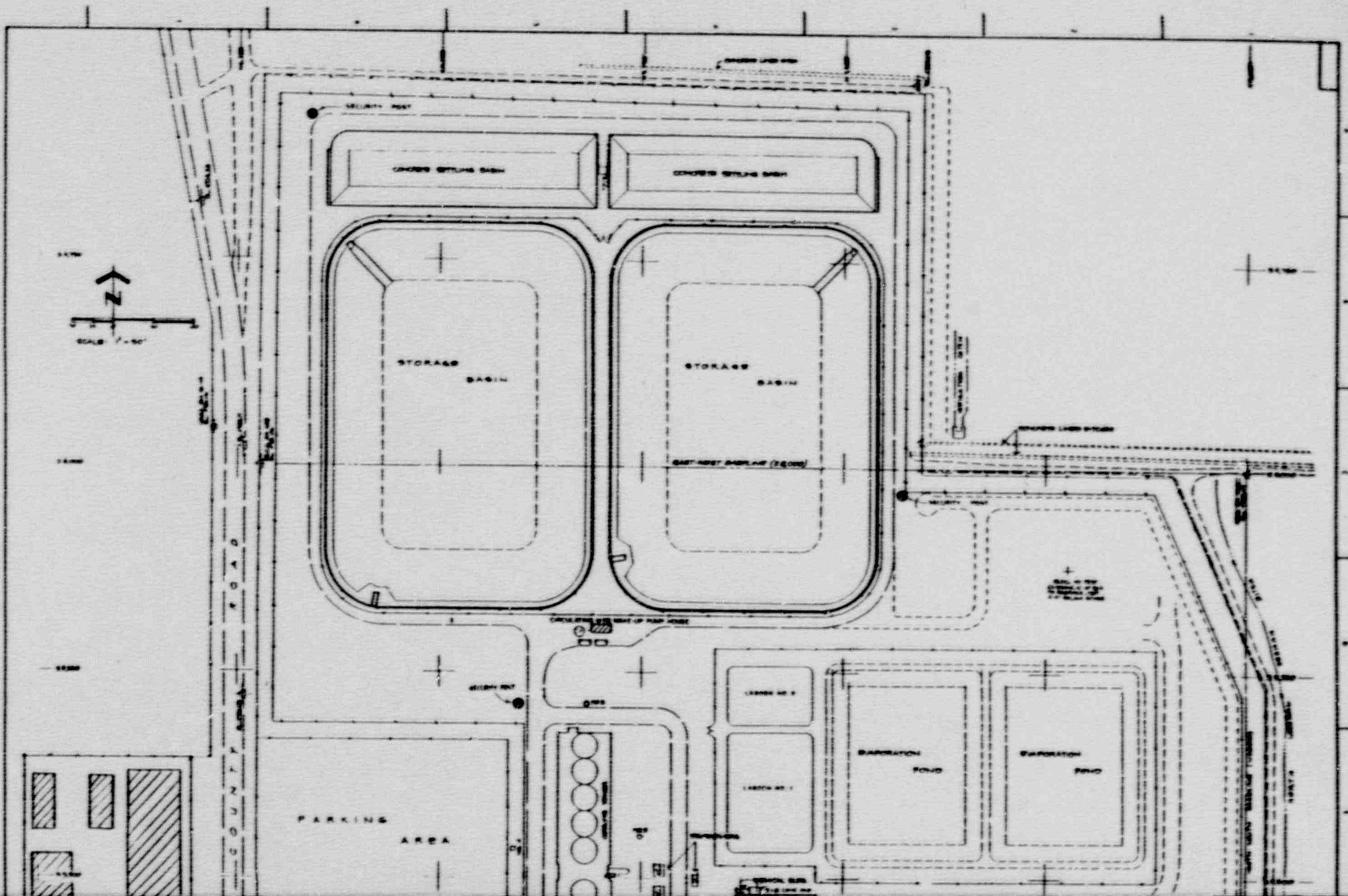

CONCRETE SETTLING BASIN
CONCRETE SETTLING BASIN
STORAGE BASIN
STORAGE BASIN
SECURITY POST
COUNTY ROAD
PARKING AREA
EVAPORATION POND
EVAPORATION POND
N

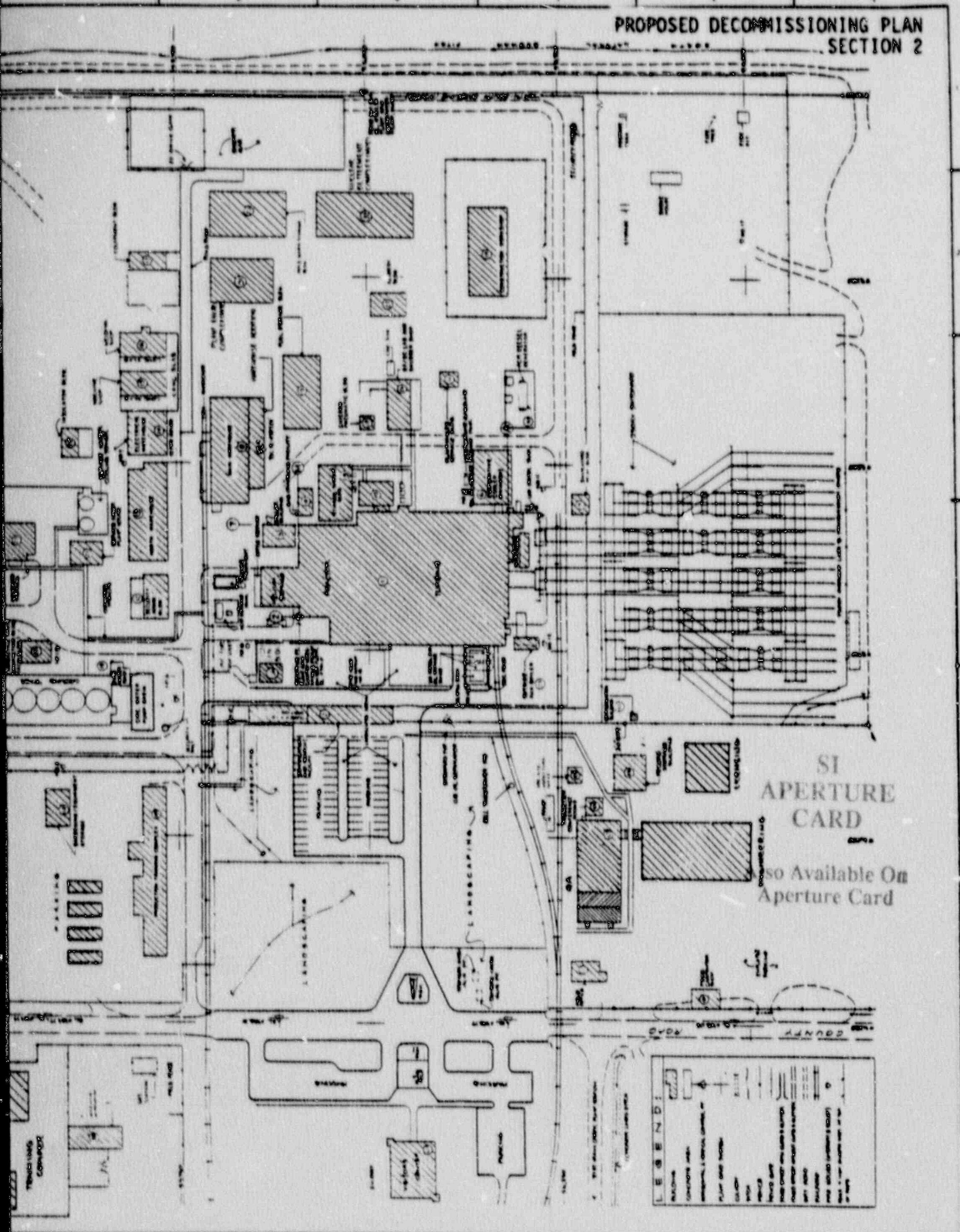


Figure 2.2-1 Fort St. Vrain Plot Plan

9011090314-01

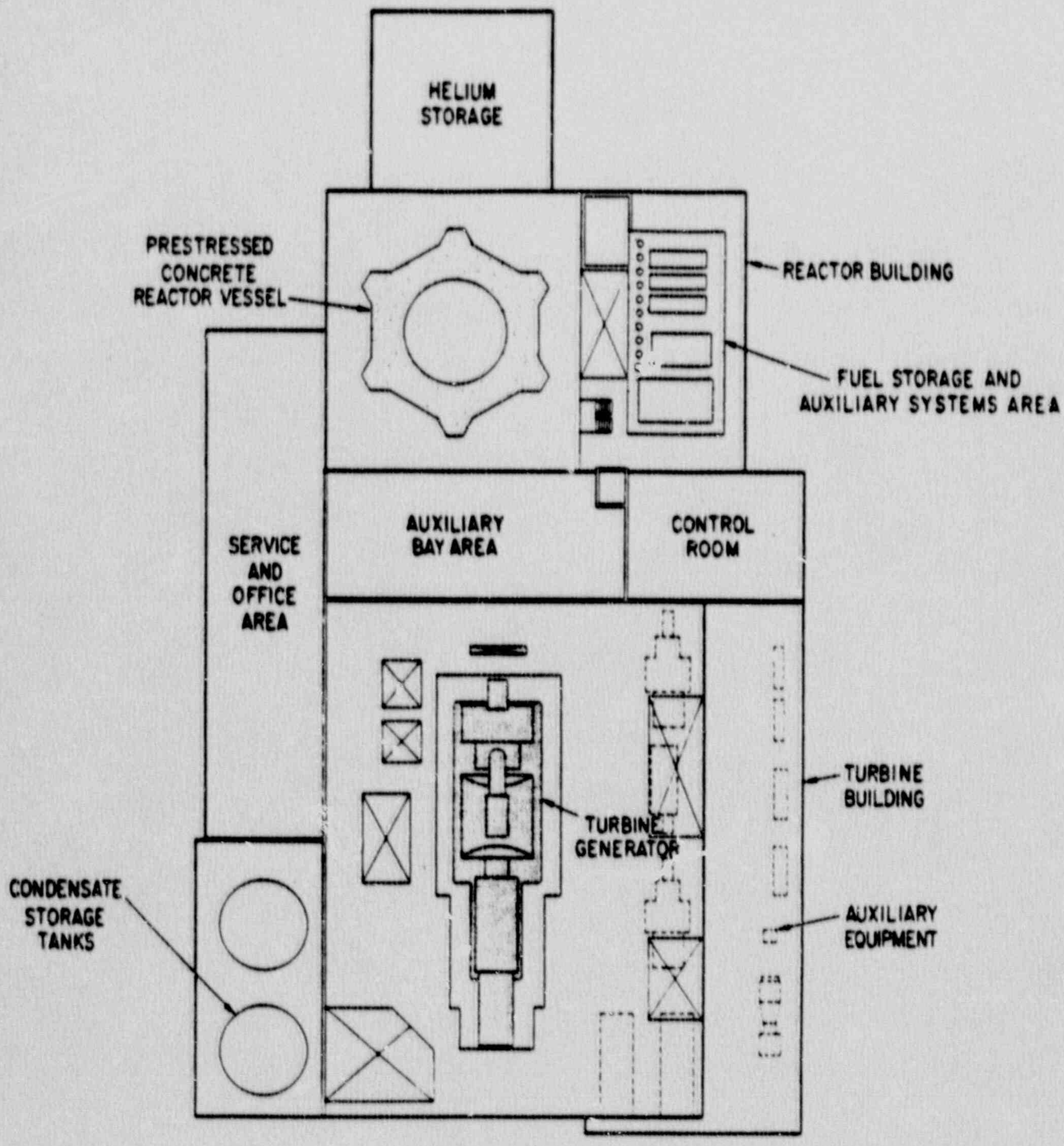


Figure 2.2-2 Reactor and Turbine Building - Plan View

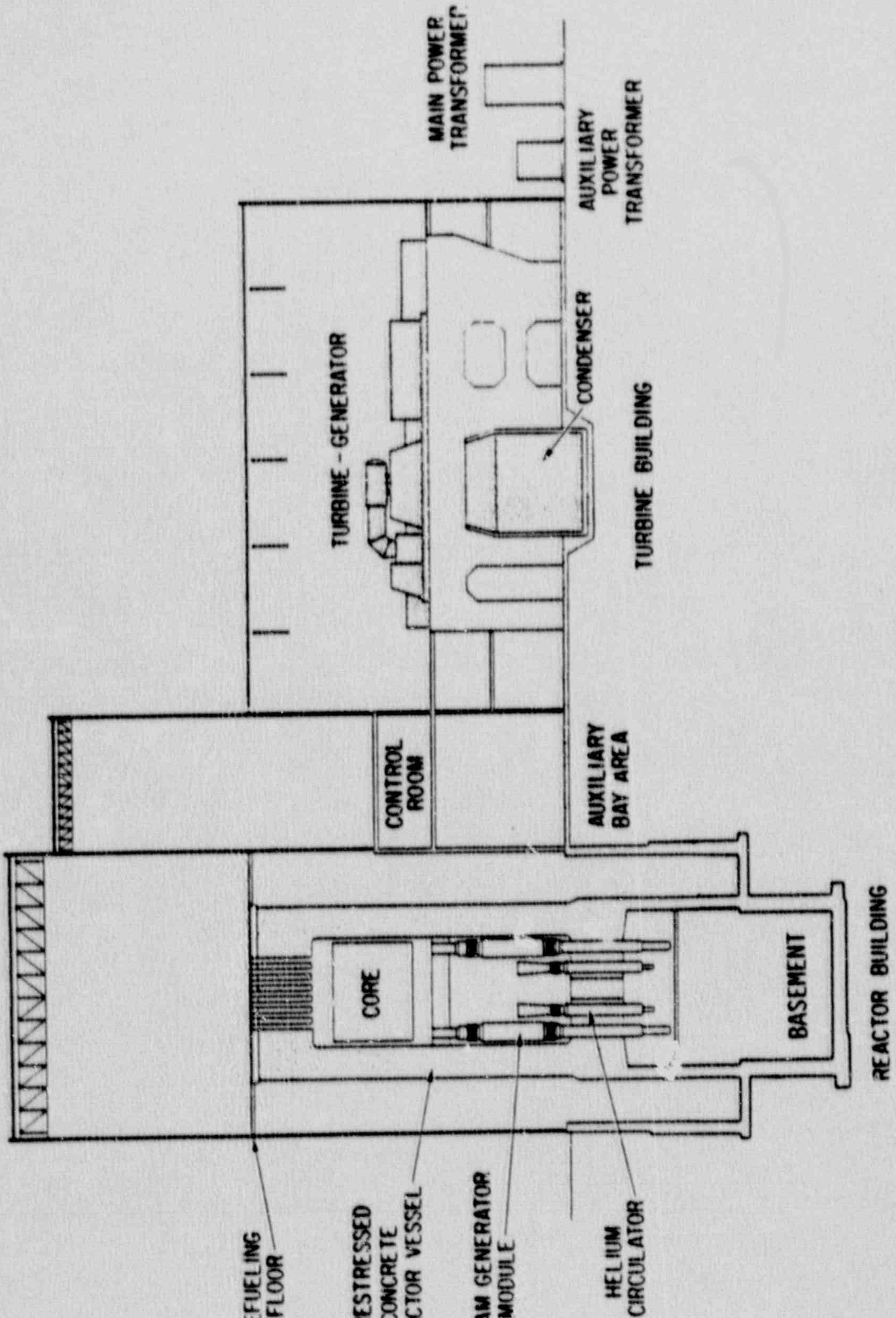


Figure 2.2-3 Reactor and Turbine Buildings - Elevation View

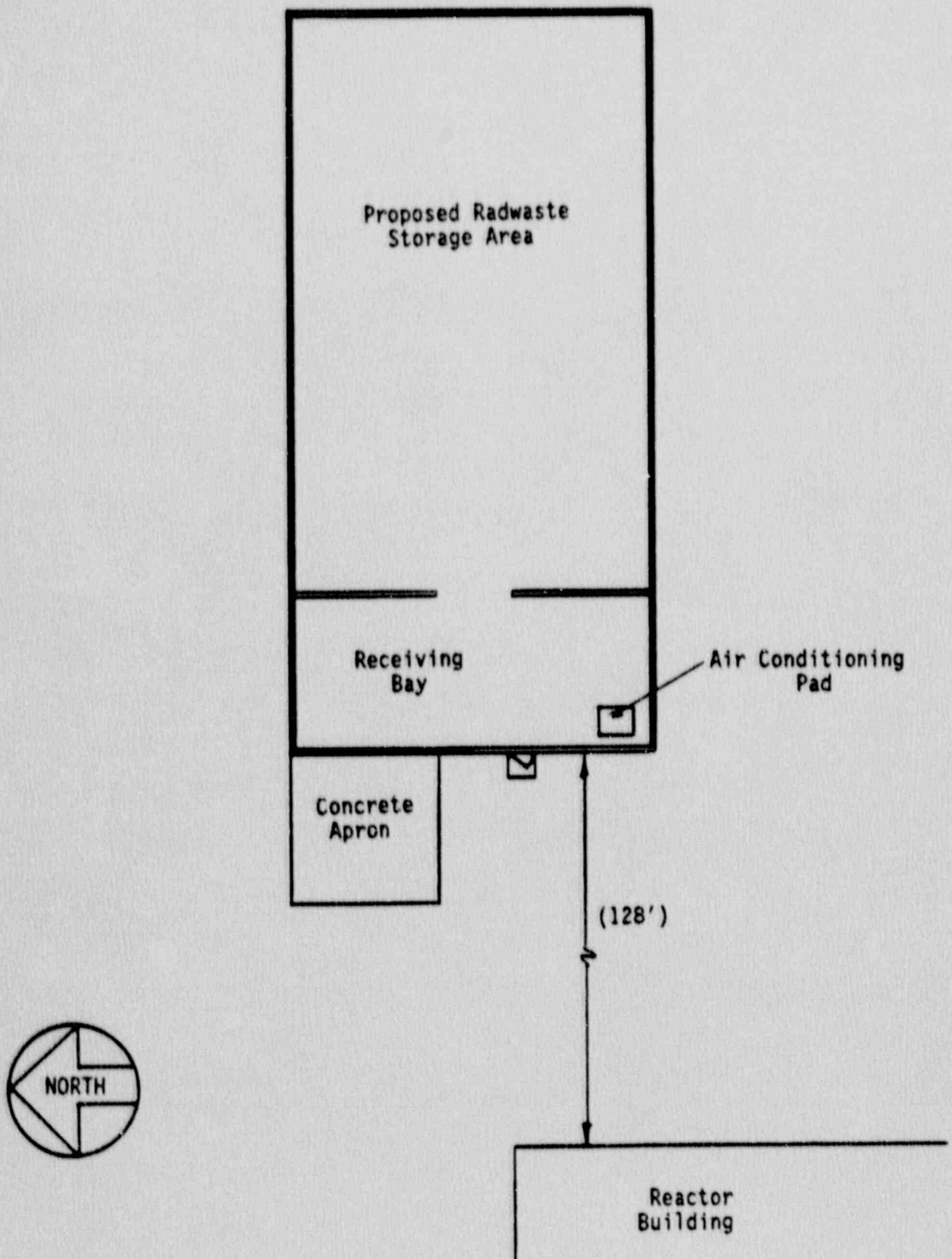


Figure 2.2-4 Fuel Storage Building

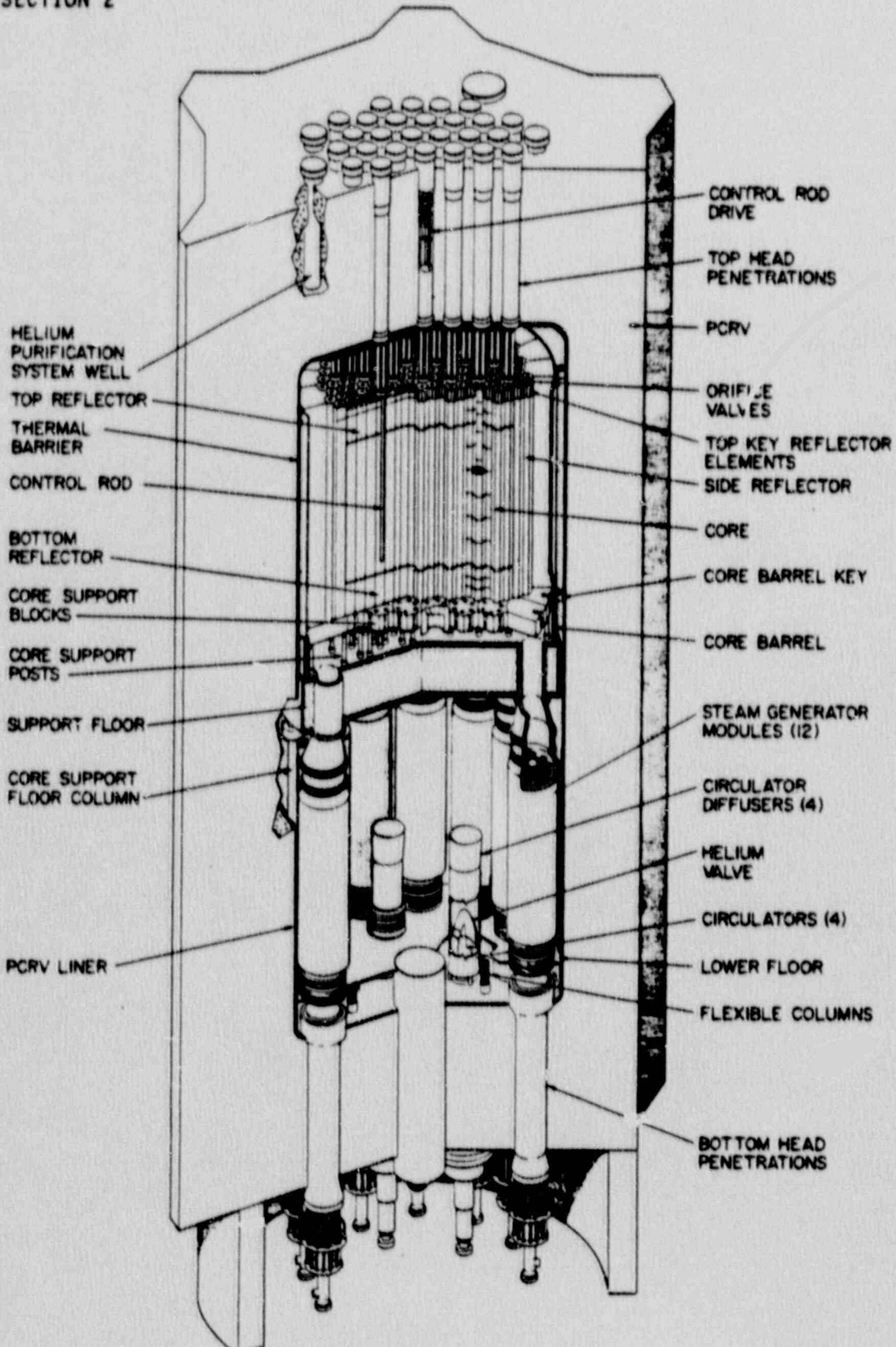


Figure 2.2-5 Prestressed Concrete Reactor Vessel (PCRV)

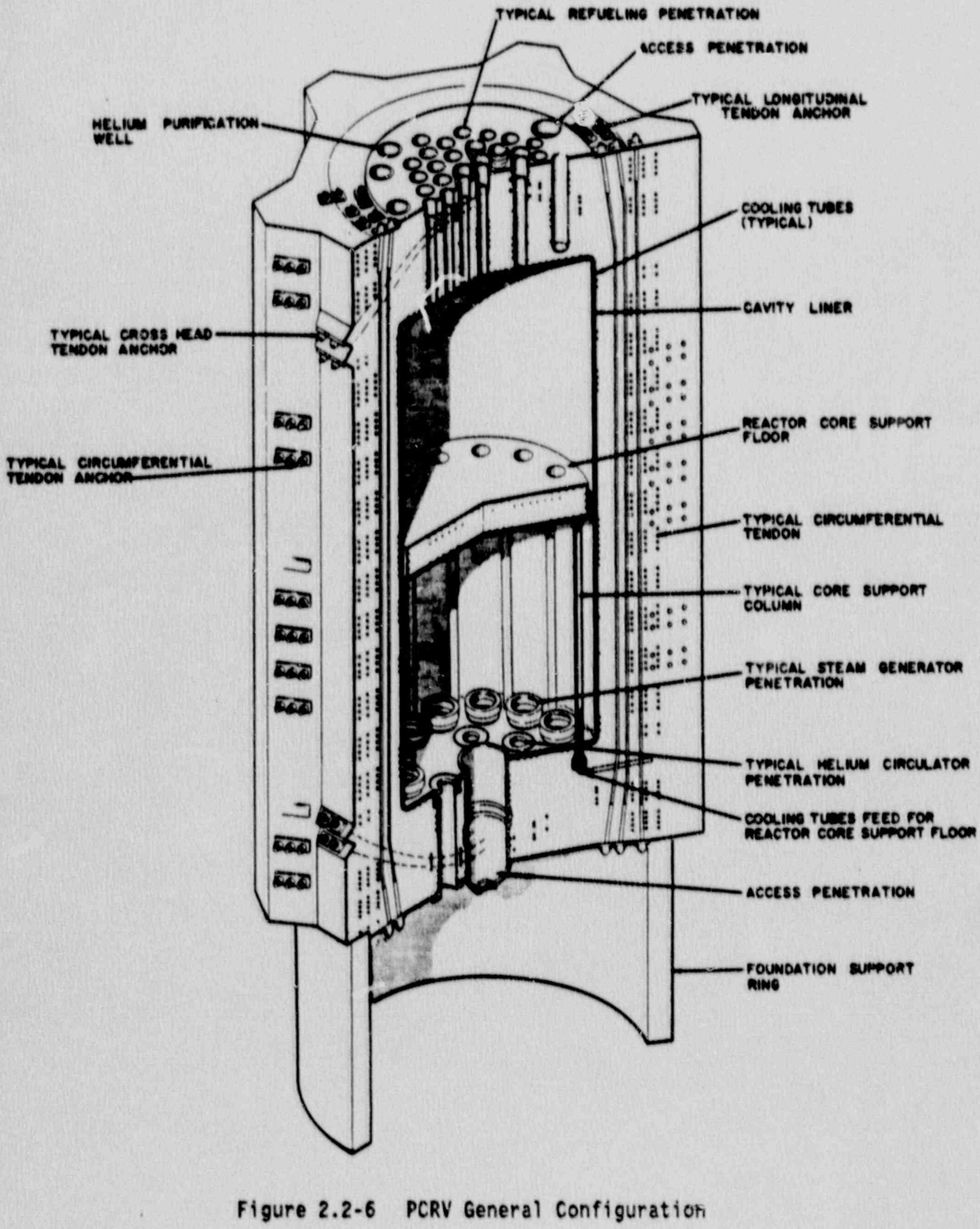


Figure 2.2-6 PCRV General Configuration

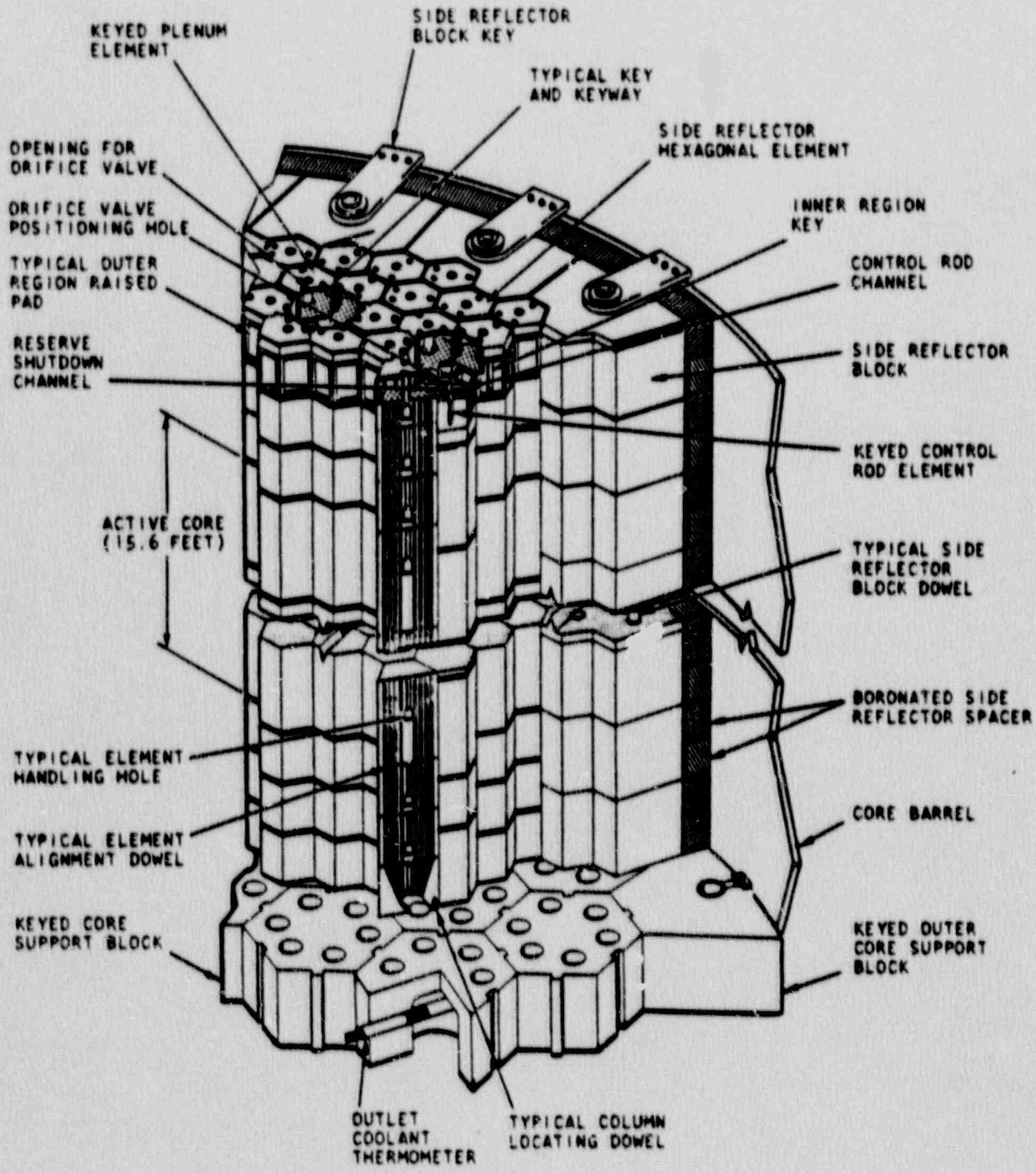
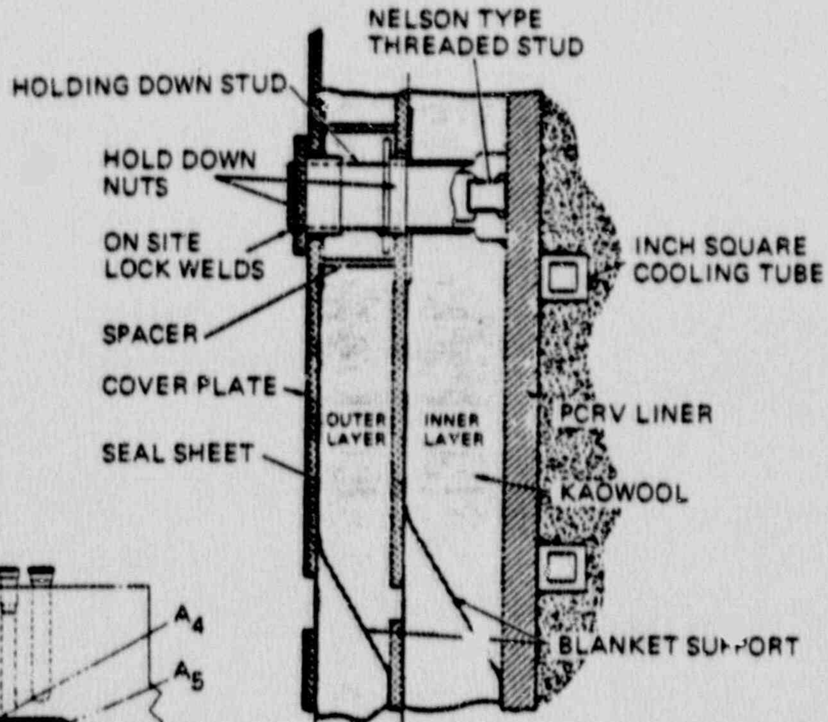
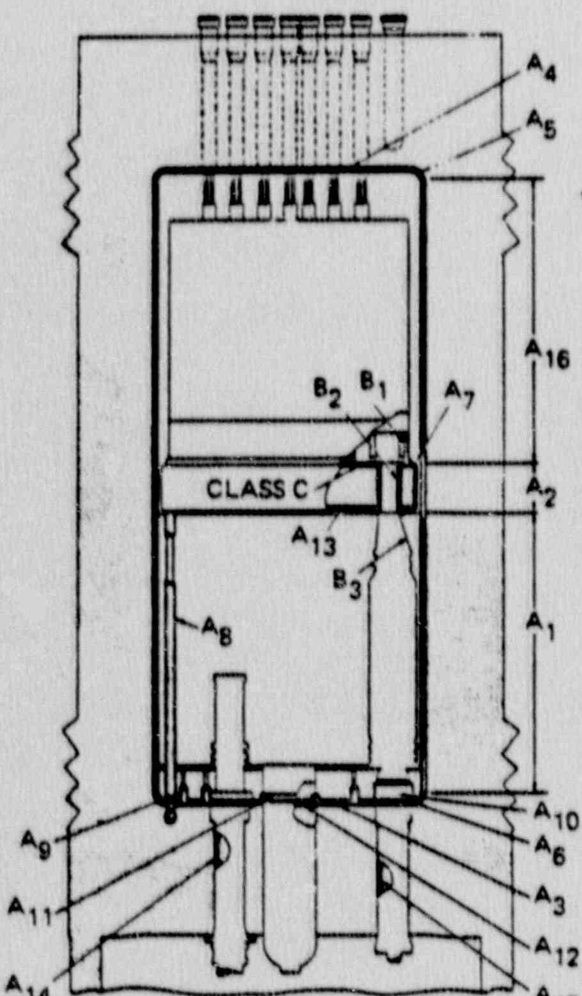


Figure 2.2-7 Core Arrangement-Elevation Section



TYPICAL SECTION THRU INSULATION IN AREA A_1



CROSS SECTION REACTOR SHOWING LOCATION OF THERMAL BARRIER AREAS

AREA	OVERALL THICKNESS TO TOP OF COVER PLATE	INSULATION MATERIAL THICKNESS AS INSTALLED	
		INNER	OUTER
CLASS A			
A_1	4-9/16 IN.	2-1/4 IN.	1-3/4 IN.
A_2	3-13/16 IN.	2-1/4 IN.	1 IN.
A_3	3-9/32 IN.	3 IN.	NONE
A_4	4-9/16 IN.	2-1/4 IN.	1-3/4 IN
$A_{5\&6}$	> 4-9/16 IN.	> 2-1/4 IN.	> 1-3/4 IN
A_7	3-5/16 IN.	1-3/4 IN.	1 IN.
$A_{8\&9}$	1-5/32 IN.	1 IN.	NONE
A_{10}	2-9/32 IN.	2 IN.	NONE
A_{11}	3-9/32 IN.	3 IN.	NONE
A_{12}	3-9/32 IN.	3 IN.	NONE
A_{13}	4-9/16 IN.	2-1/4 IN.	1-3/4 IN.
A_{14}	1-5/32 IN.	1 IN.	NONE
A_{15}	2 IN.	METALLIC	INSULATION
A_{16}	3-13/16 IN	2-1/4 IN	1 IN
CLASS B			
B_1	3-1/2 IN.	3-1/4 IN.	NONE
B_2	3 IN.	1-1/8 IN	1-1/8 IN
B_3	2-1/4 IN	1-3/4 IN	NONE
CLASS C			
C	12 IN	2-3/4 IN	9 IN

Figure 2.2-8 Thermal Barrier Arrangement

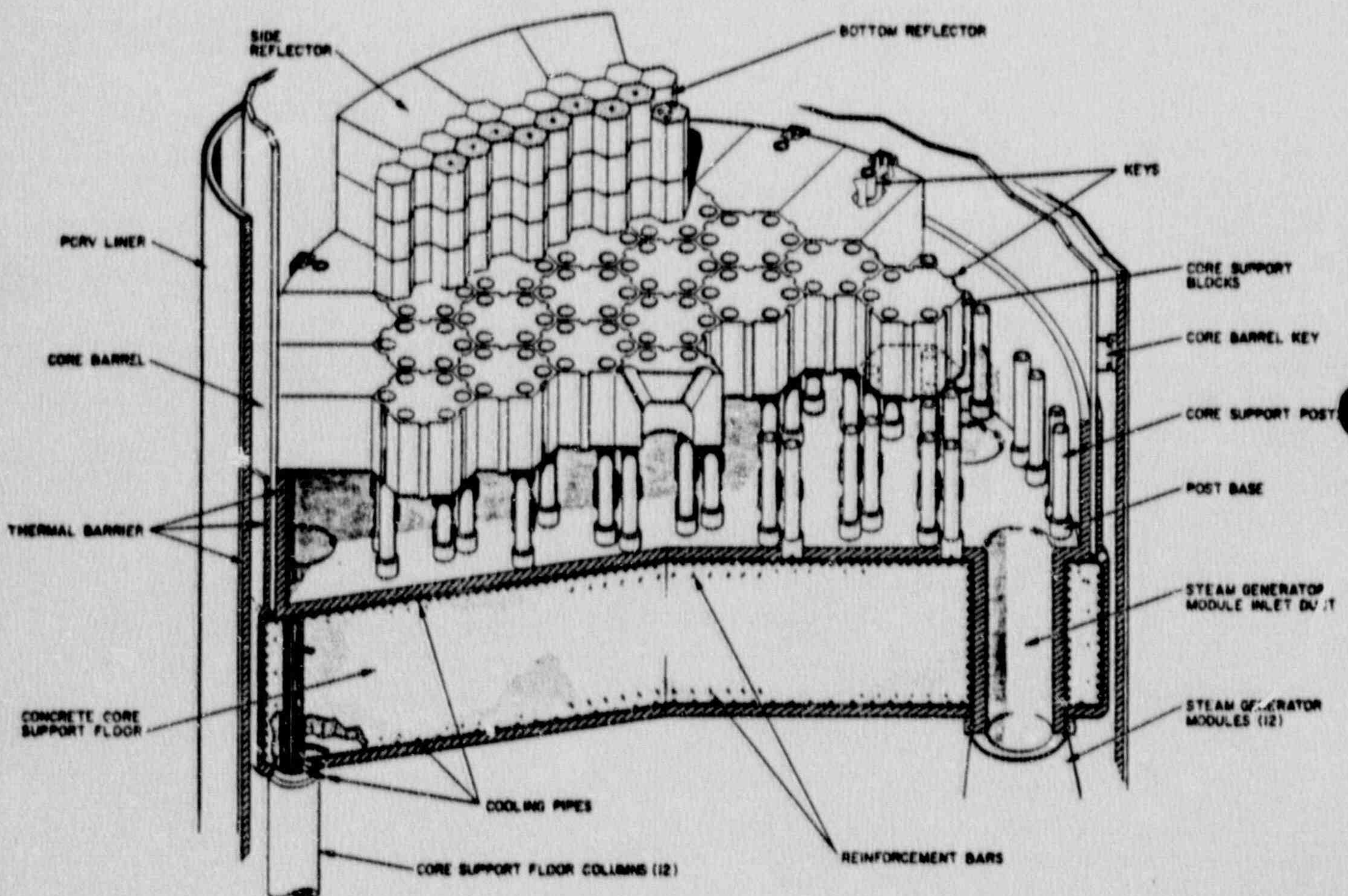
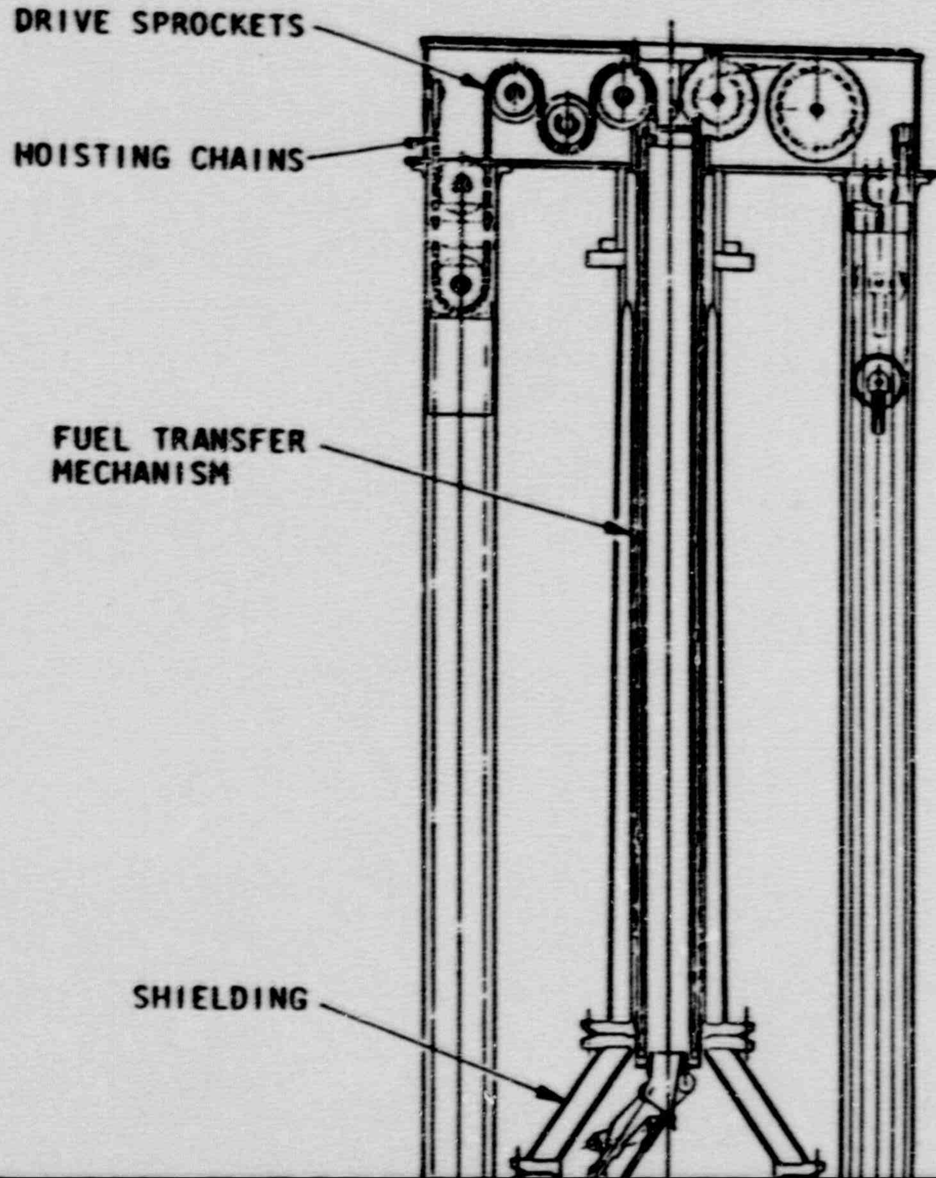


Figure 2.2-9 Core Support Arrangement


DRIVE SPROCKETS
HOISTING CHAINS
FUEL TRANSFER MECHANISM
SHIELDING

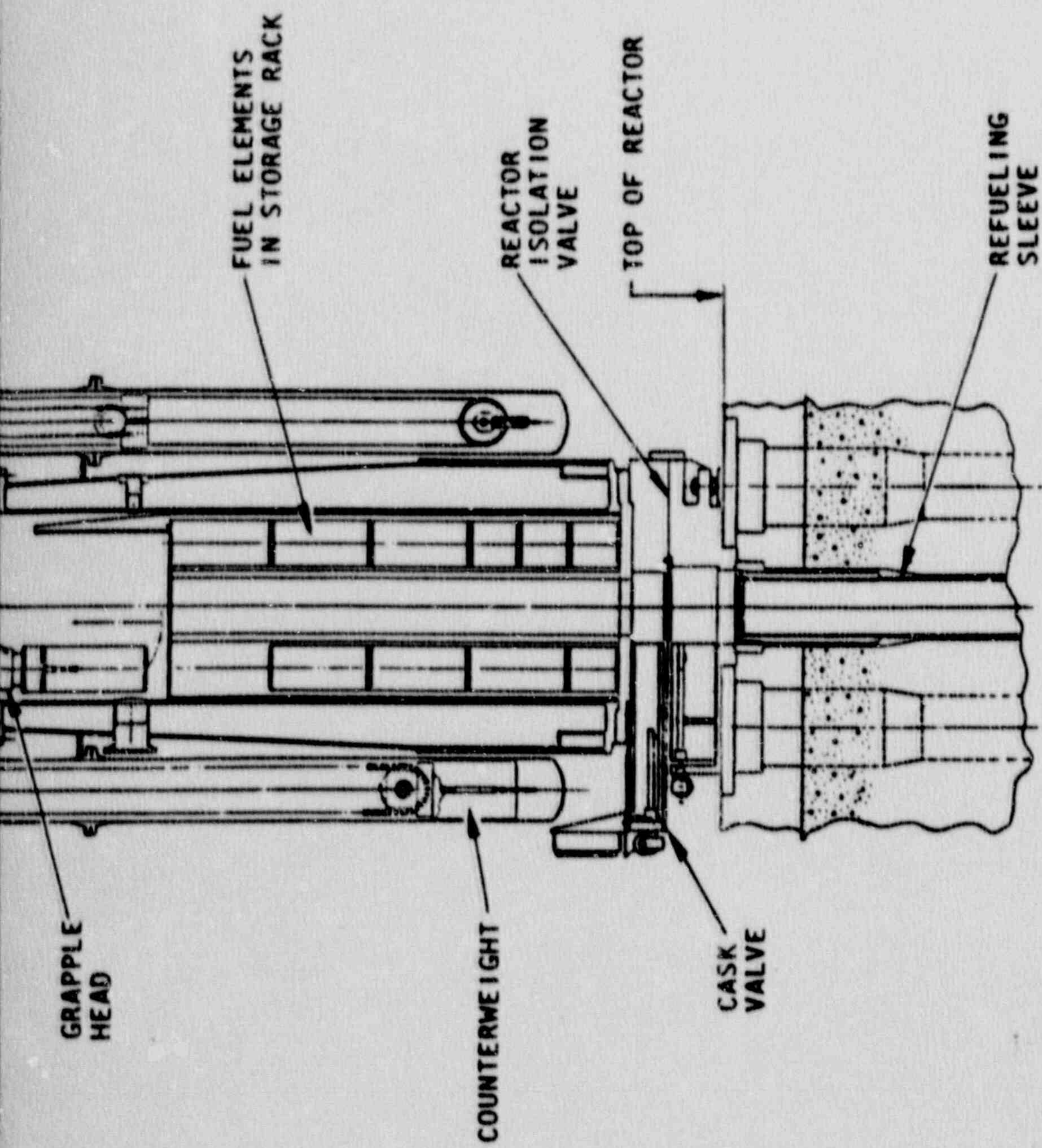


Figure 2.2-10 Fuel Handling Machine

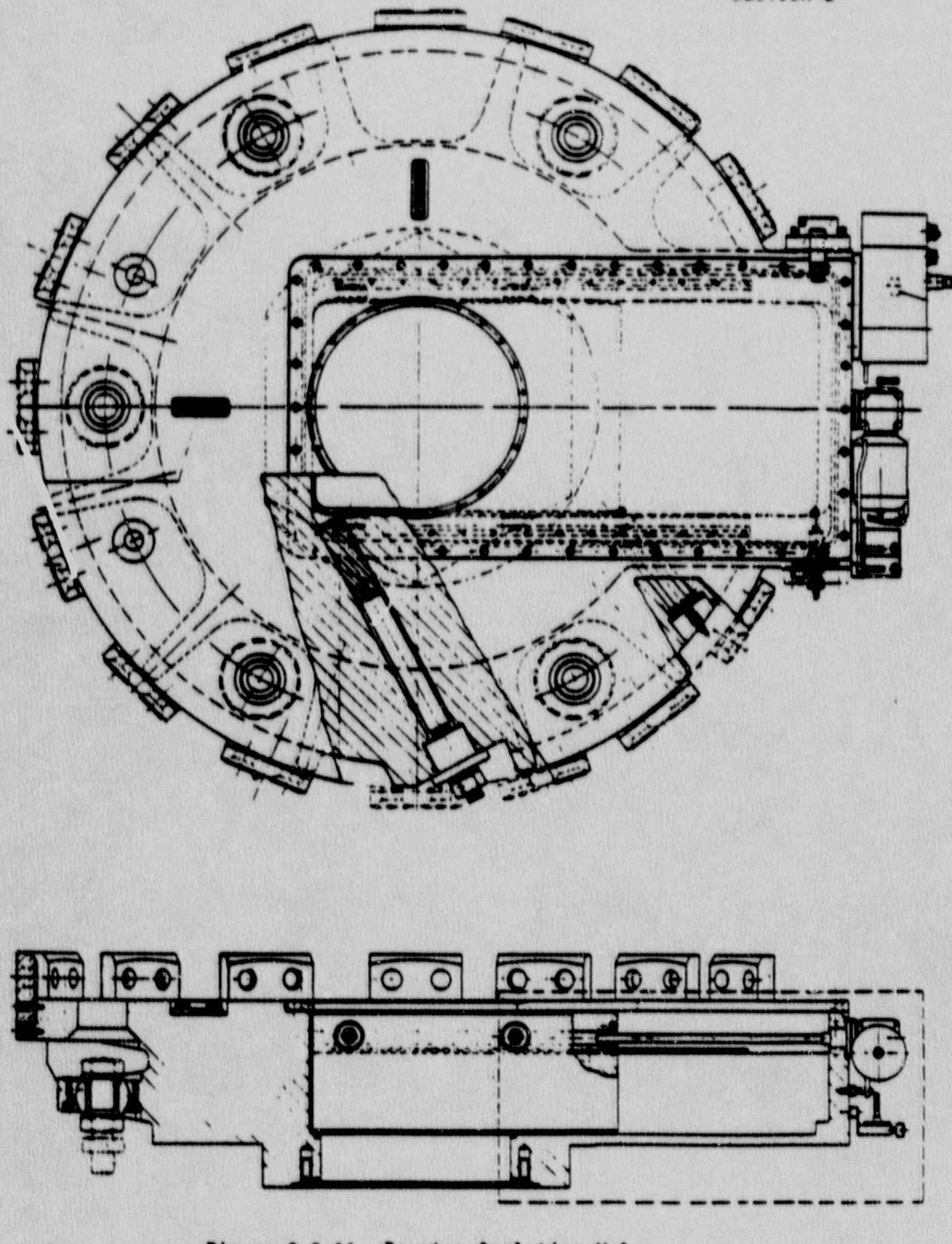
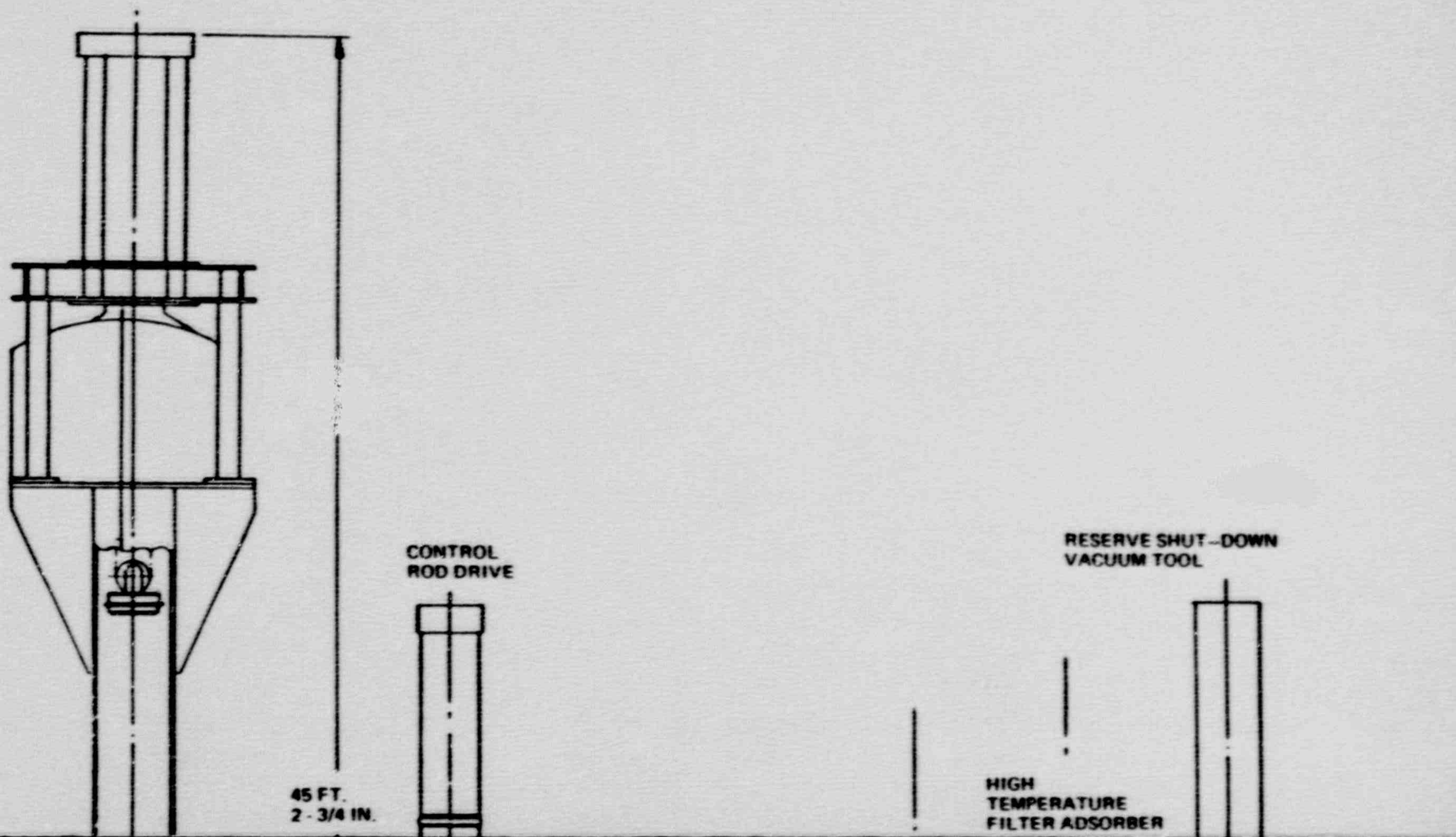
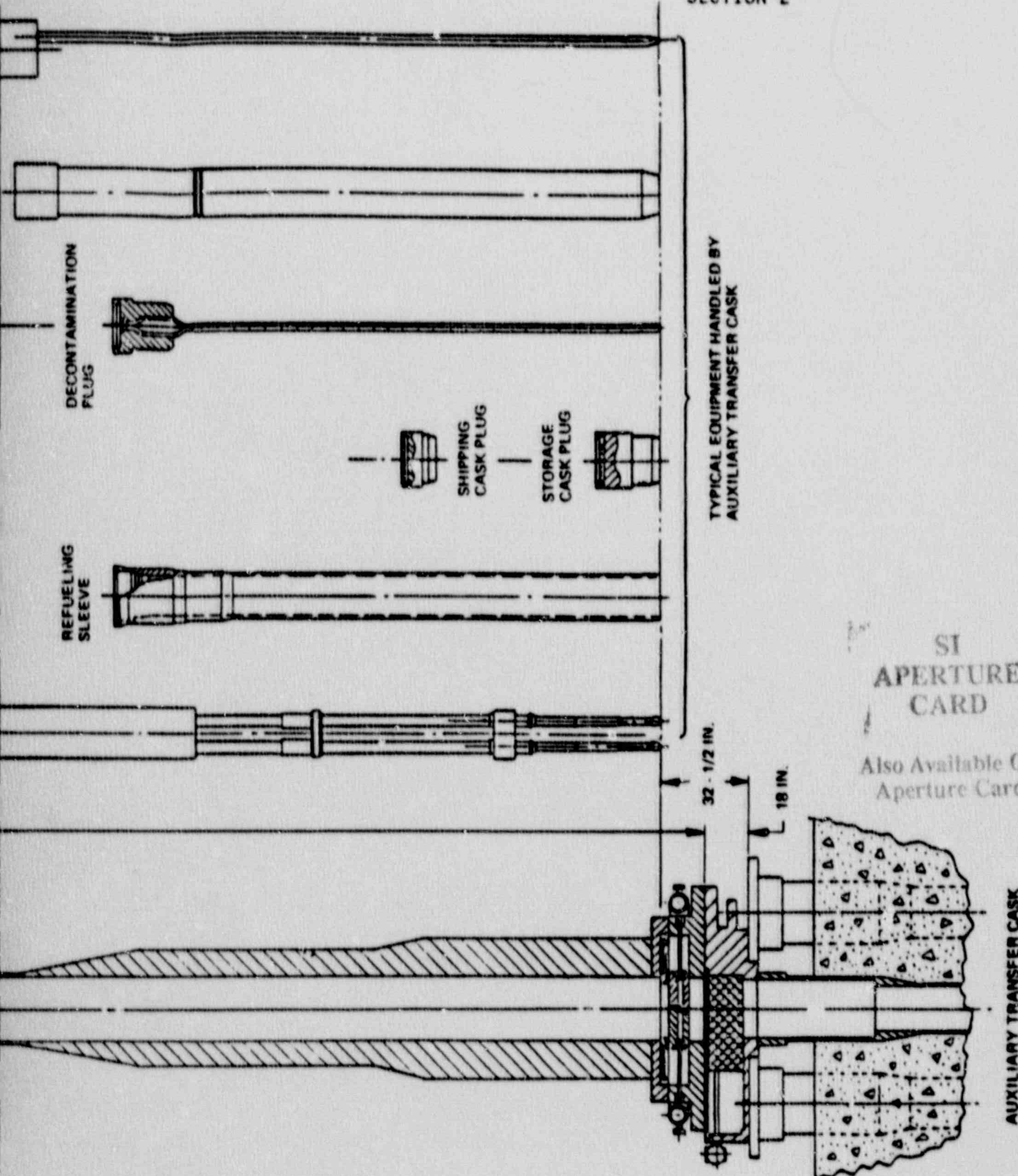


Figure 2.2-11 Reactor Isolation Valve


45 FT.
2 - 3/4 IN.
CONTROL
ROD DRIVE
RESERVE SHUT-DOWN
VACUUM TOOL
HIGH
TEMPERATURE
FILTER ADSORBER



9011090314-03

Figure 2.2-12 Auxiliary Transfer
Cask and Associated
Auxiliary Equipment

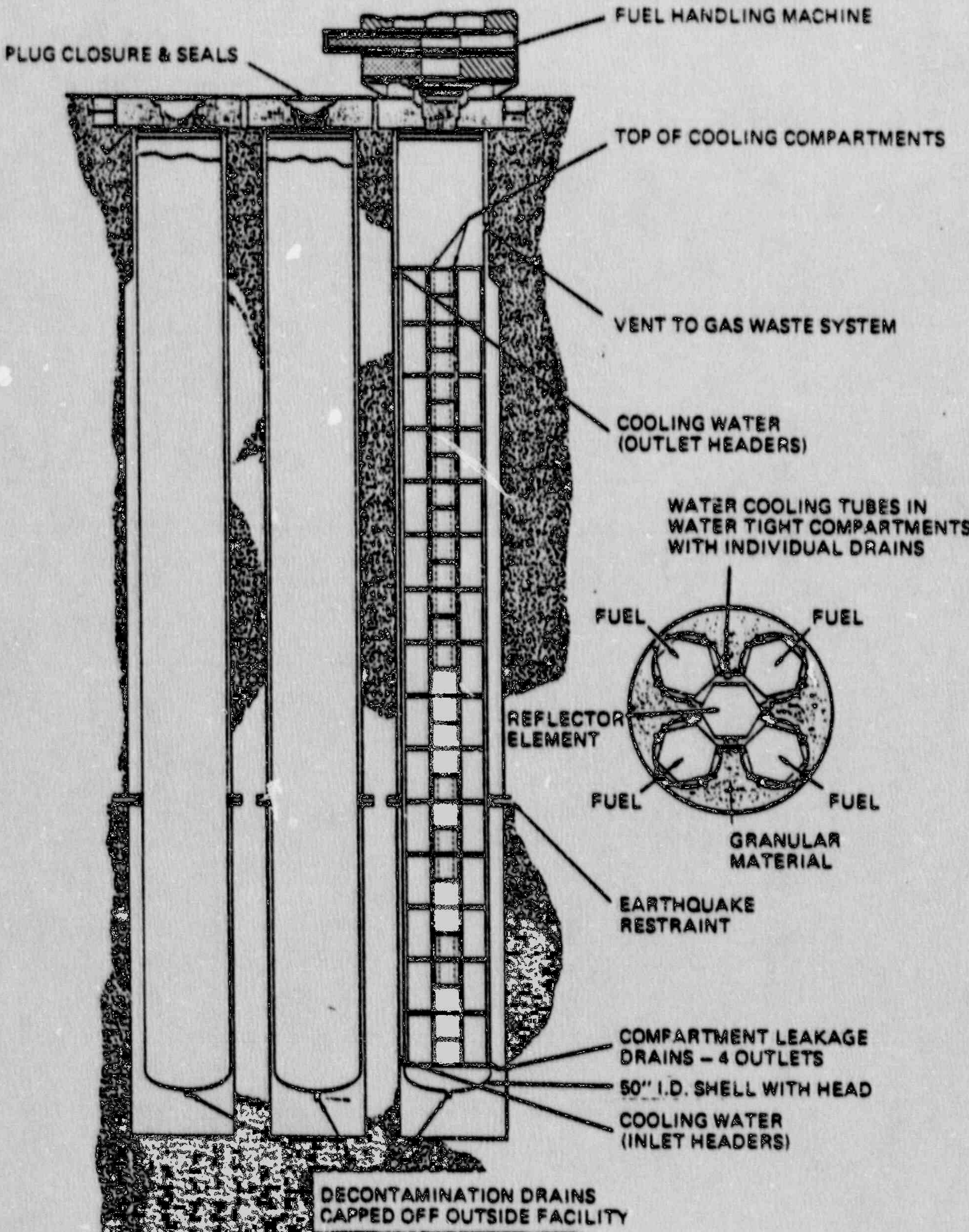


Figure 2.2-13 Fuel Storage Wells

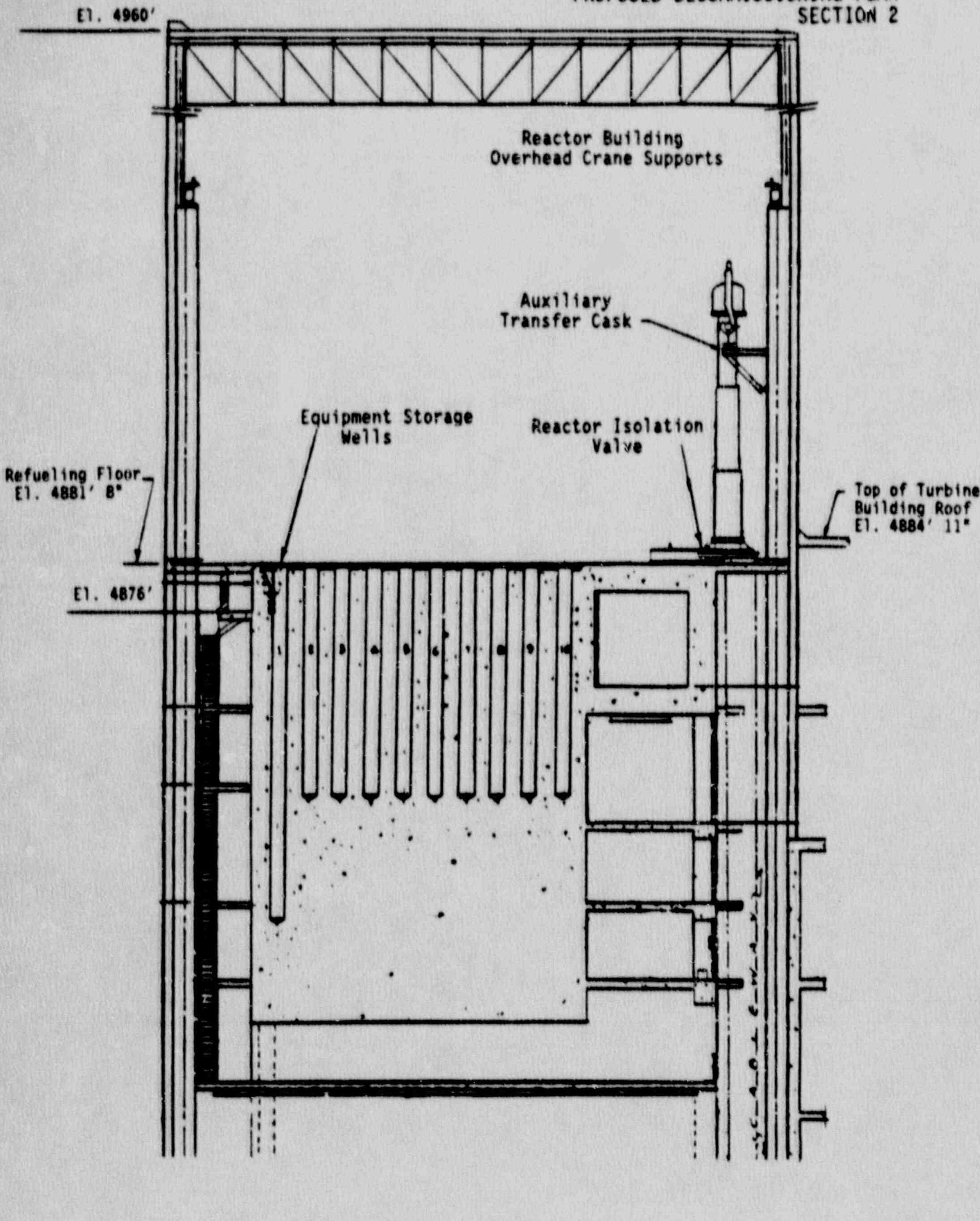


Figure 2.2-14 Reactor Plant Arrangement
Equipment Storage Wells

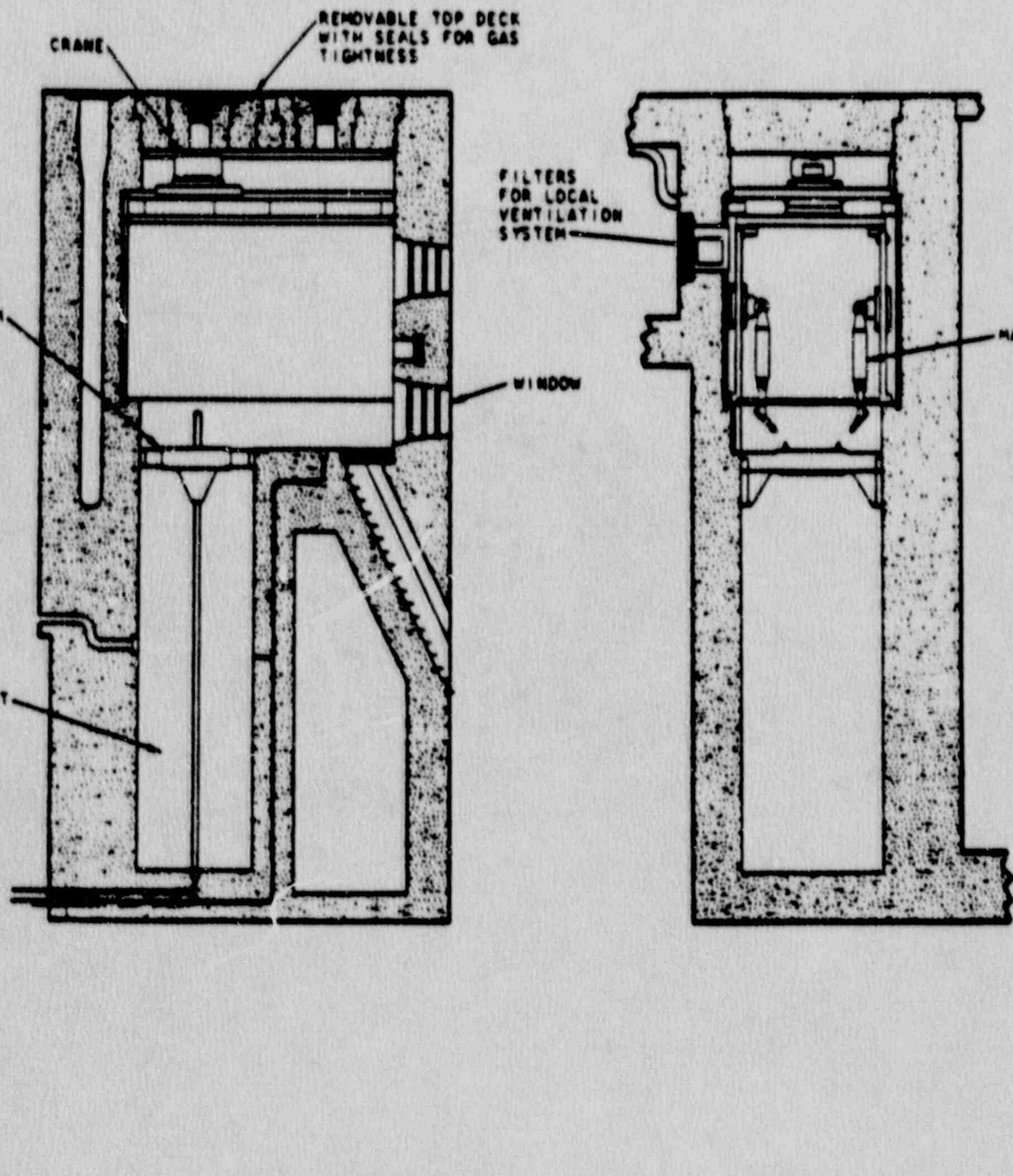


Figure 2.2-15 Hot Service Facility

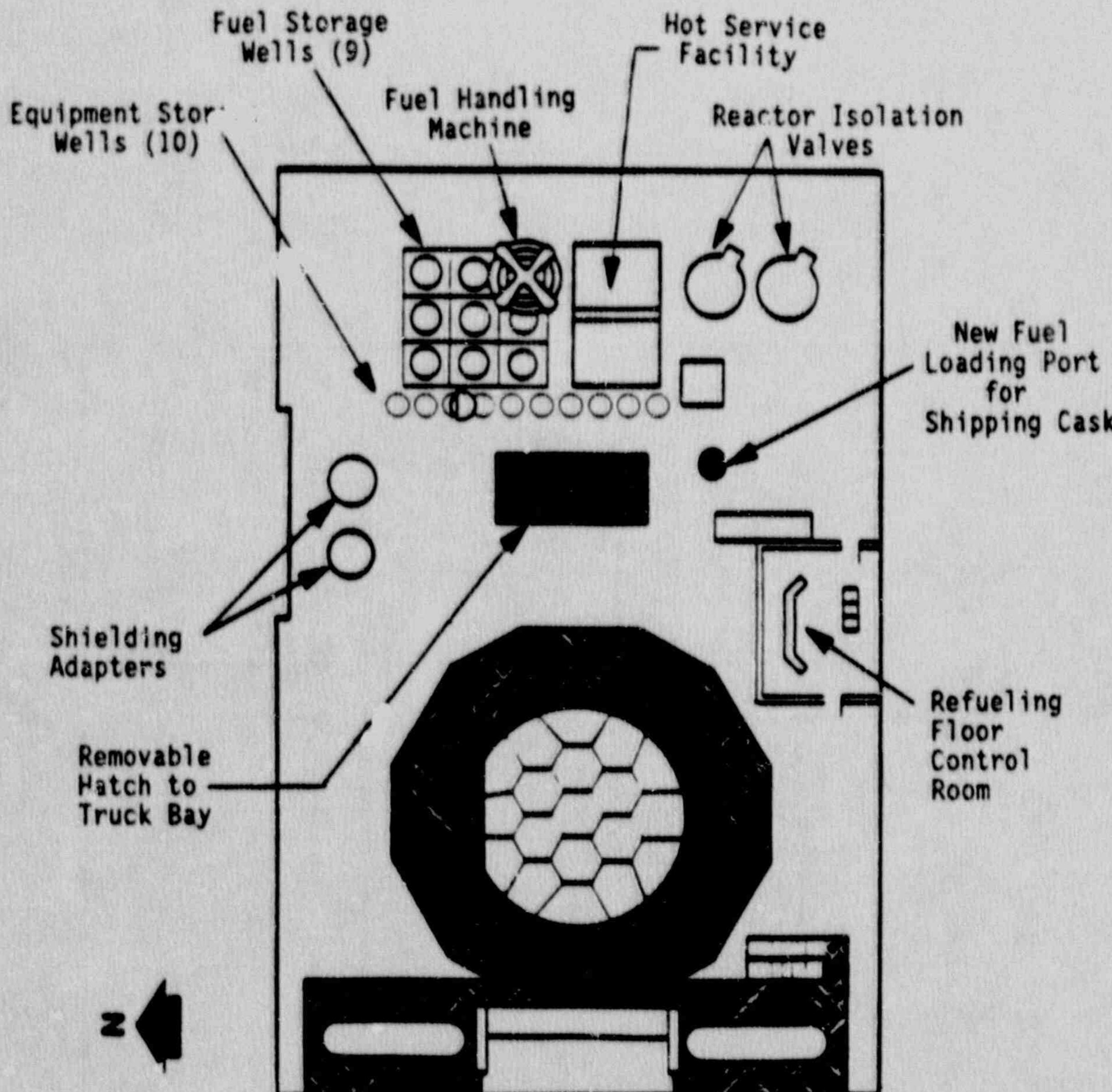
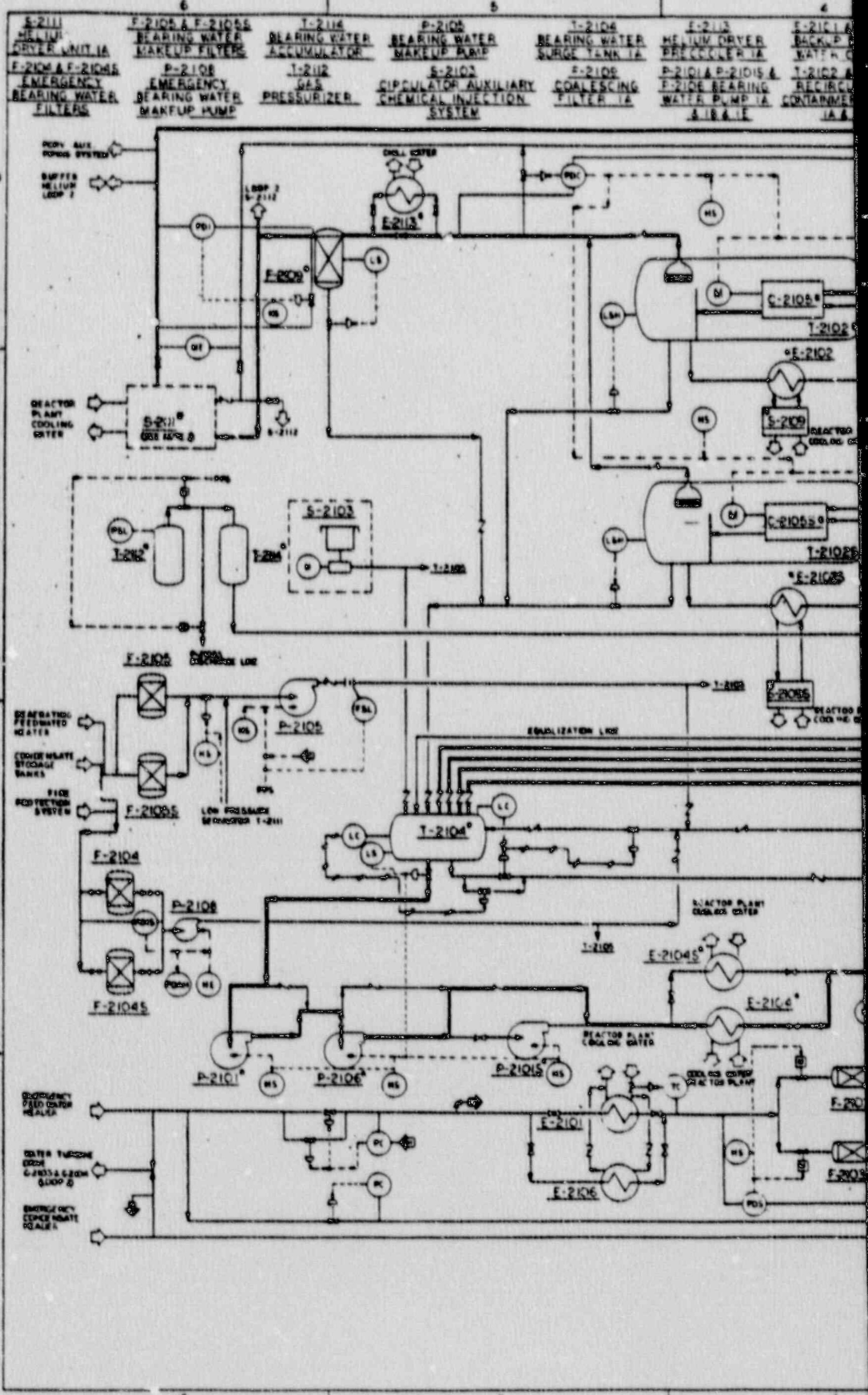


Figure 2.2-16 Reactor Plant Arrangement:
Refueling Floor Layout


S-2111 HELIUM DRYER UNIT 1A
F-2104 & F-2104S EMERGENCY BEARING WATER FILTERS
F-2105 & F-2105S BEARING WATER MAKEUP FILTERS
P-2108 EMERGENCY BEARING WATER MAKEUP PUMP
T-2114 BEARING WATER ACCUMULATOR
T-2112 GAS PRESSURIZER
P-2105 BEARING WATER MAKEUP PUMP
S-2103 CIRCULATOR AUXILIARY CHEMICAL INJECTION SYSTEM
T-2104 BEARING WATER SURGE TANK 1A
F-2109 COALESCING FILTER 1A
E-2113 HELIUM DRYER PRECOOLER 1A
P-2101 & P-2101S & F-2106 BEARING WATER PUMP 1A & 1B & 1E
EQUALIZATION LINE
T-2104
F-2104
F-2104S
P-2108
P-2105
F-2105
F-2105S
P-2101
P-2106
P-2101S
E-2104S
E-2104
E-2101
E-2106
T-2102
T-2102S
C-2105
C-2105S
E-2102
E-2102S
S-2109
S-2103
T-2112
T-2114
F-2109
E-2113
S-2111

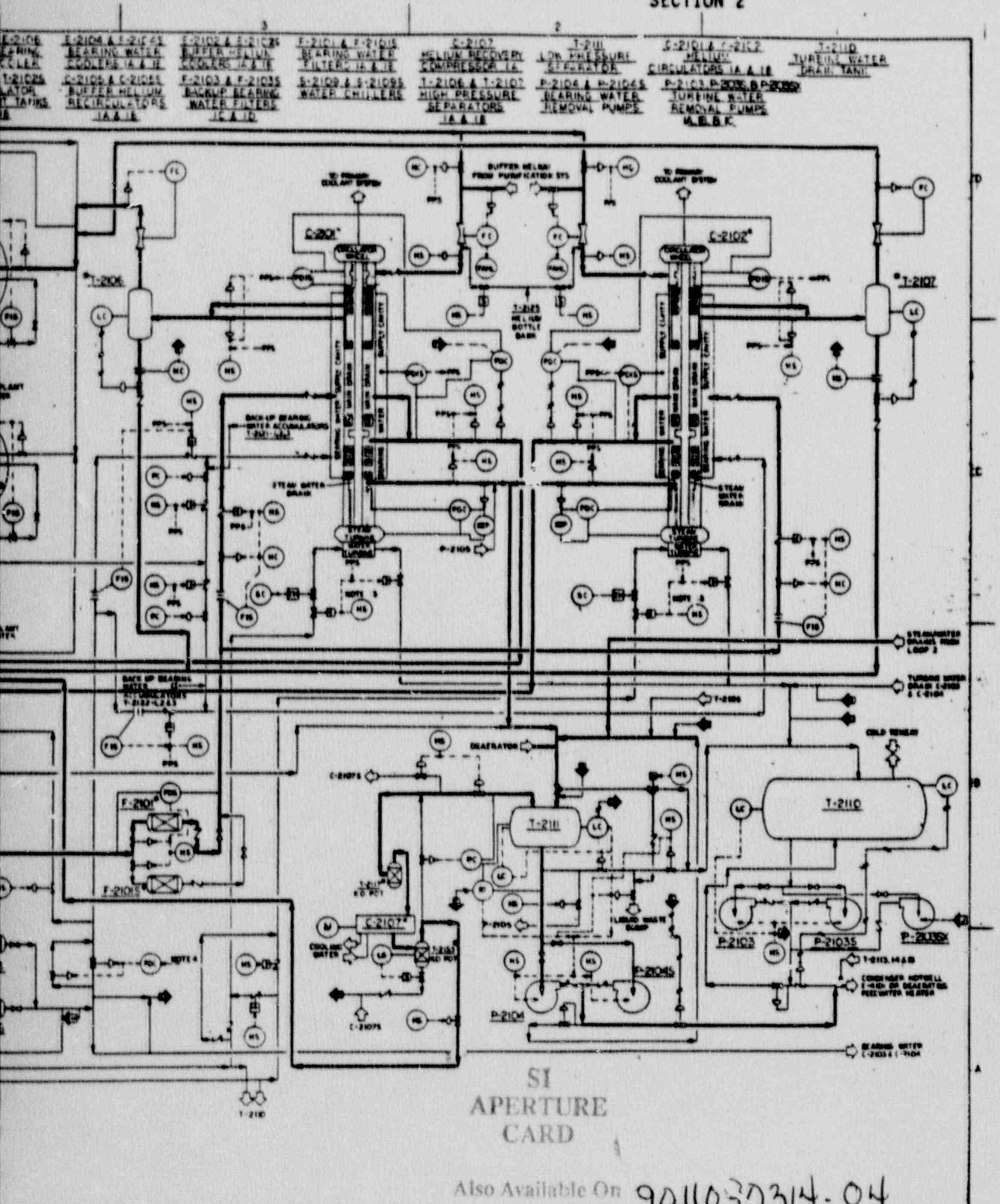
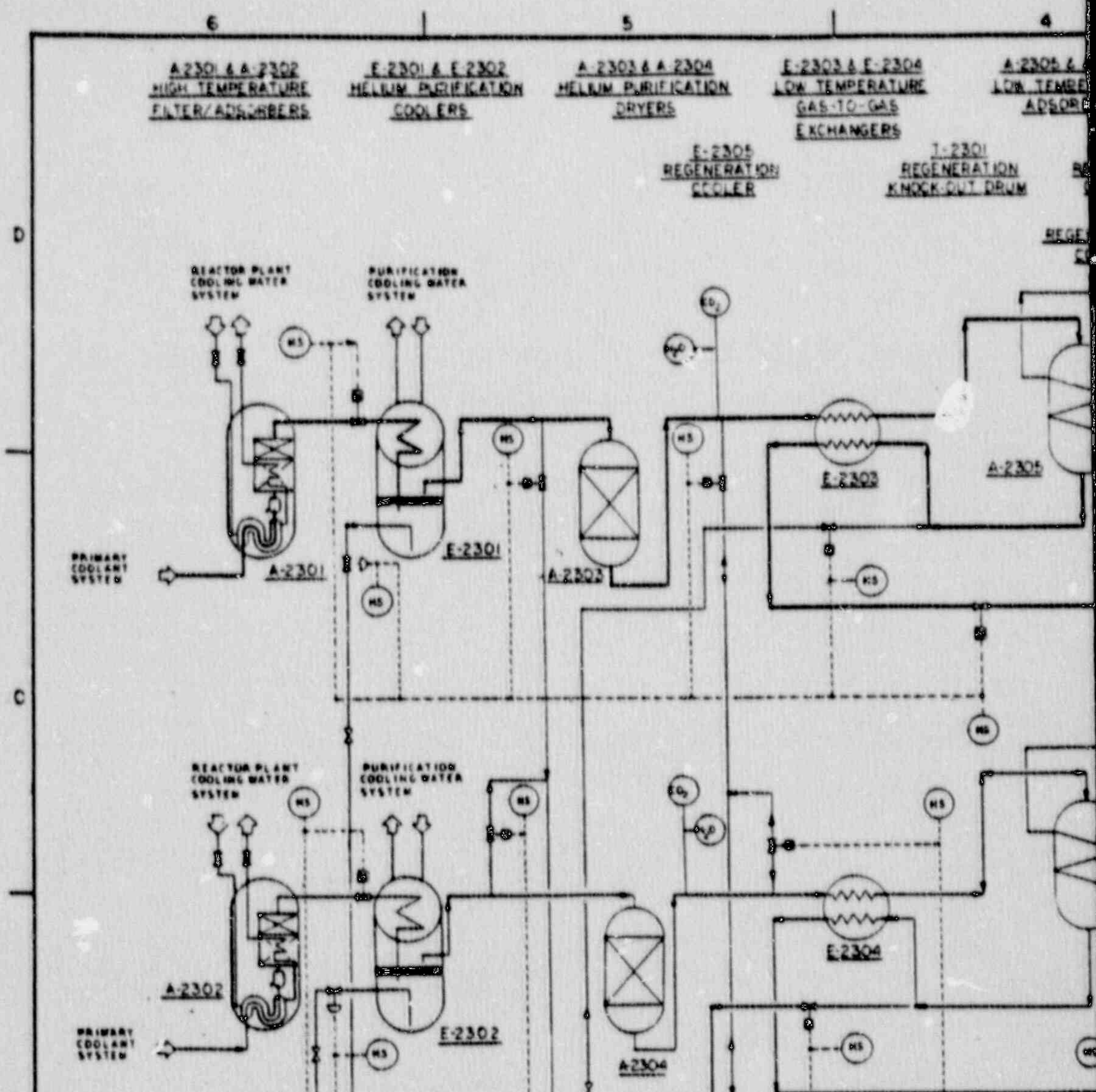
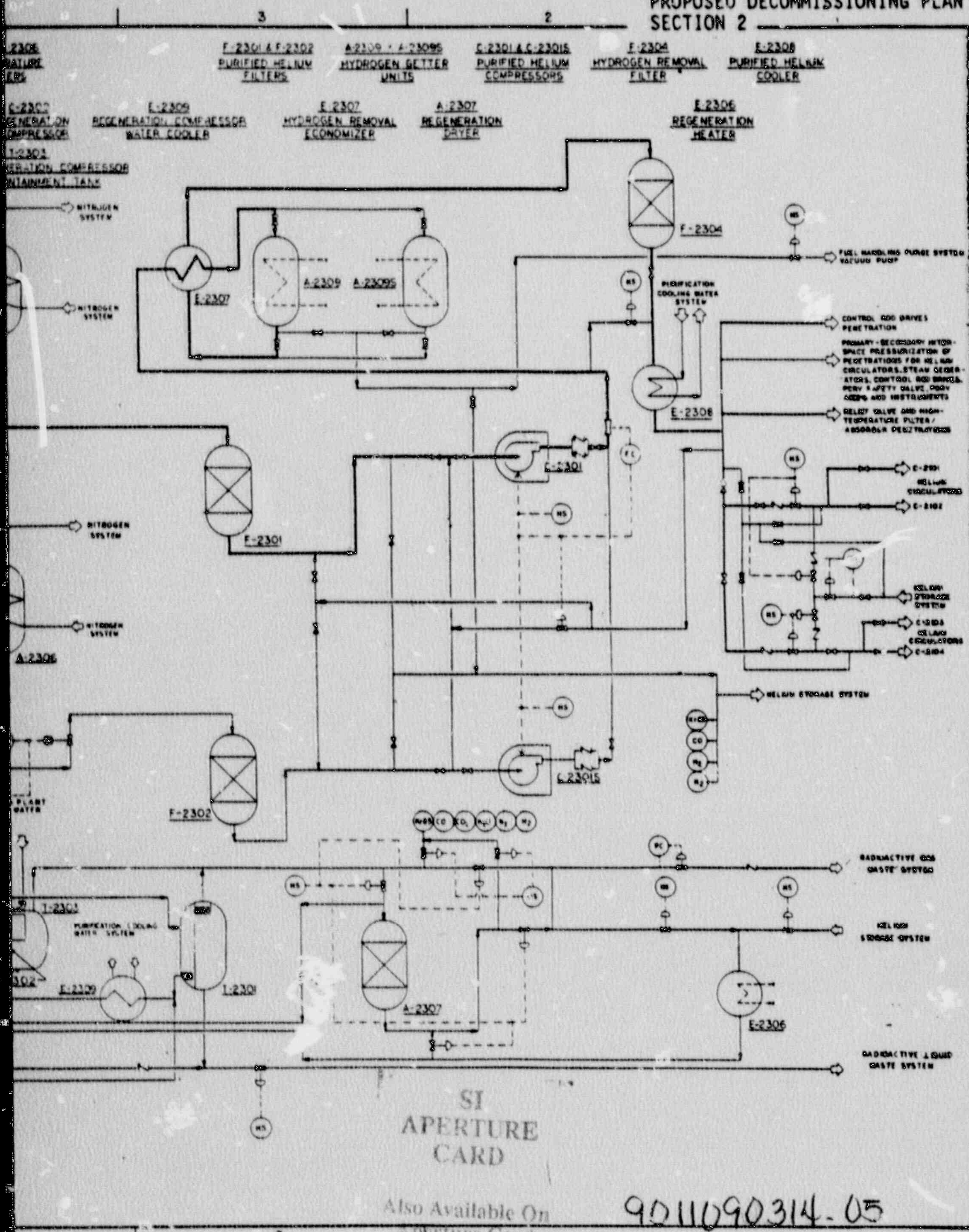


Figure 2.2-17 Helium Circulator Auxiliary Equipment (System 21)


6
5
4
A-2301 & A-2302
HIGH TEMPERATURE
FILTER/ADSORBERS
E-2301 & E-2302
HELIUM PURIFICATION
COOLERS
A-2303 & A-2304
HELIUM PURIFICATION
DRYERS
E-2303 & E-2304
LOW TEMPERATURE
GAS-TO-GAS
EXCHANGERS
E-2305
REGENERATION
COOLER
T-2301
REGENERATION
KNOCK-OUT DRUM
D
C
B
A
REACTOR PLANT
COOLING WATER
SYSTEM
PURIFICATION
COOLING WATER
SYSTEM
PRIMARY
COOLANT
SYSTEM
A-2301
E-2301
A-2303
E-2303
A-2305
A-2302
E-2302
A-2304
E-2304
E-2305
HELIUM STORAGE
SYSTEM

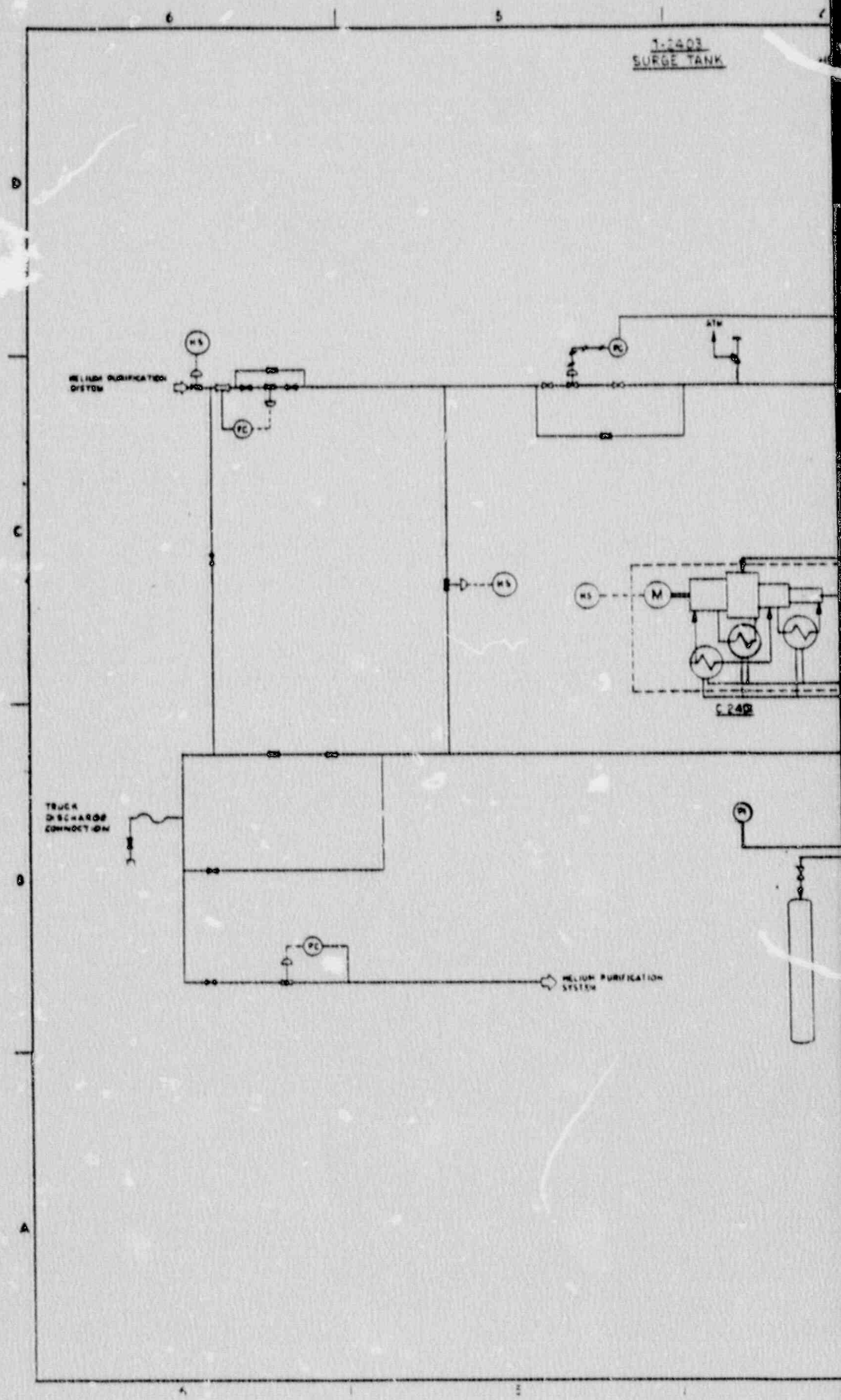


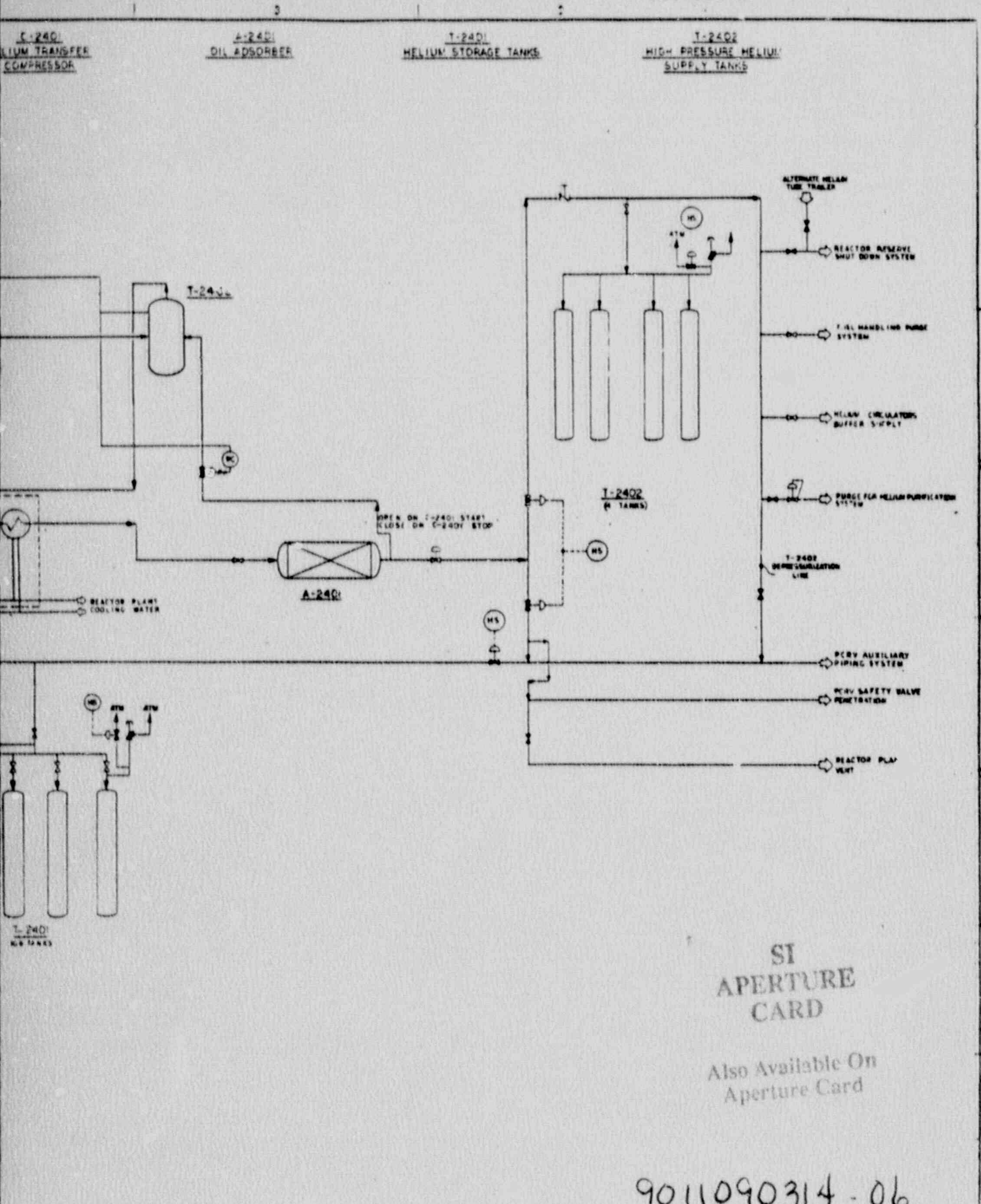
SI APERTURE CARD

Also Available On Aperture Card

9011090314-05

Figure 2.2-18 Helium Purification System Auxiliaries (System 23)


T-2403
SURGE TANK
HELIUM PURIFICATION SYSTEM
PC
HS
ATM
M
C 2401
TRUCK DISCHARGE CONNECTION
PC
HELIUM PURIFICATION SYSTEM

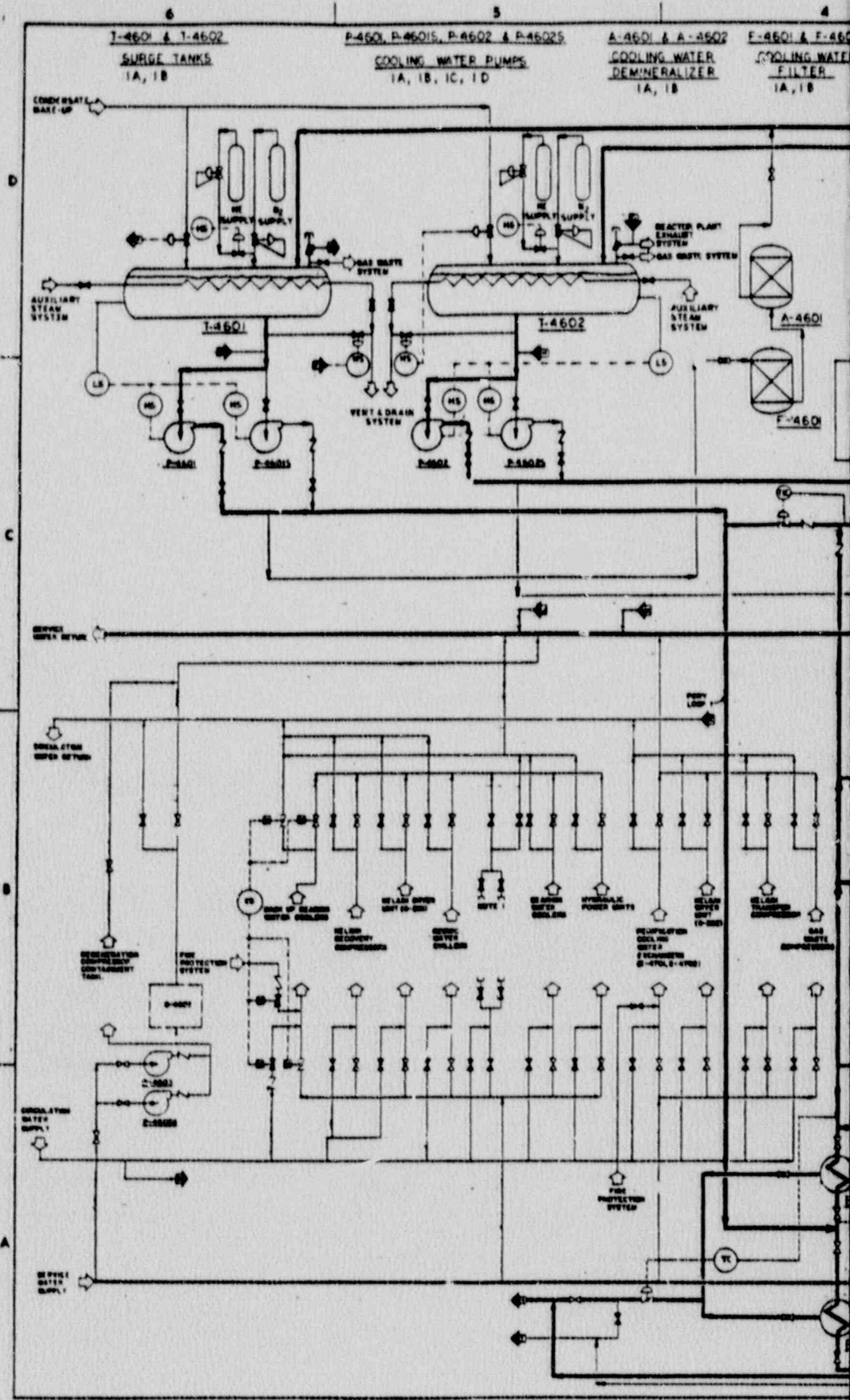


SI
APERTURE
CARD

Also Available On
Aperture Card

9011090314-06

Figure 2.2-19 Helium Storage
System (System 24)



T-4601 & T-4602
SURGE TANKS
1A, 1B
P-4601, P-4601S, P-4602 & P-4602S
COOLING WATER PUMPS
1A, 1B, 1C, 1D
A-4601 & A-4602
COOLING WATER
DEMINERALIZER
1A, 1B
FILTER
1A, 1B
AUXILIARY STEAM SYSTEM
T-4601
T-4602
VENT & DRAIN SYSTEM
A-4601
F-4601

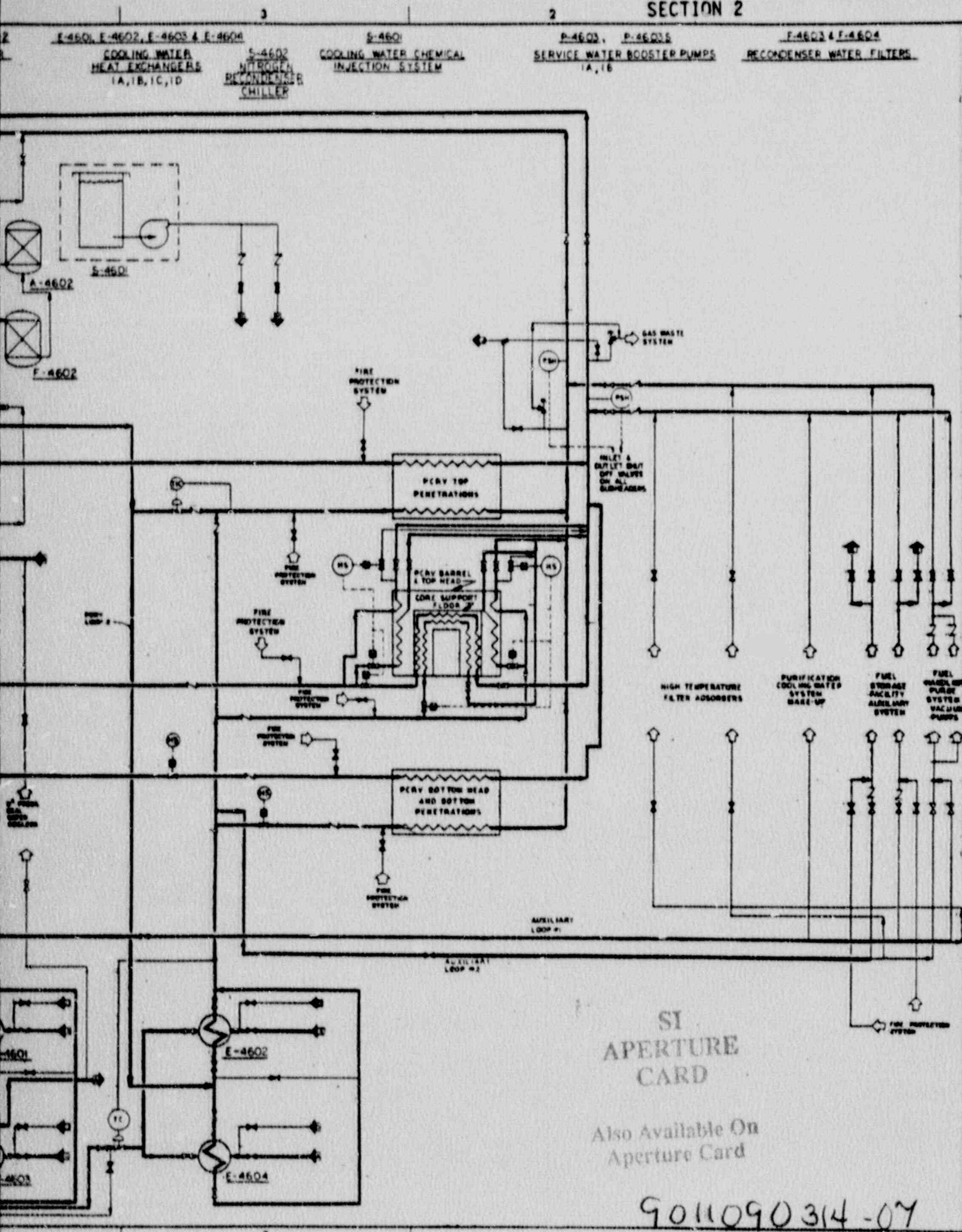
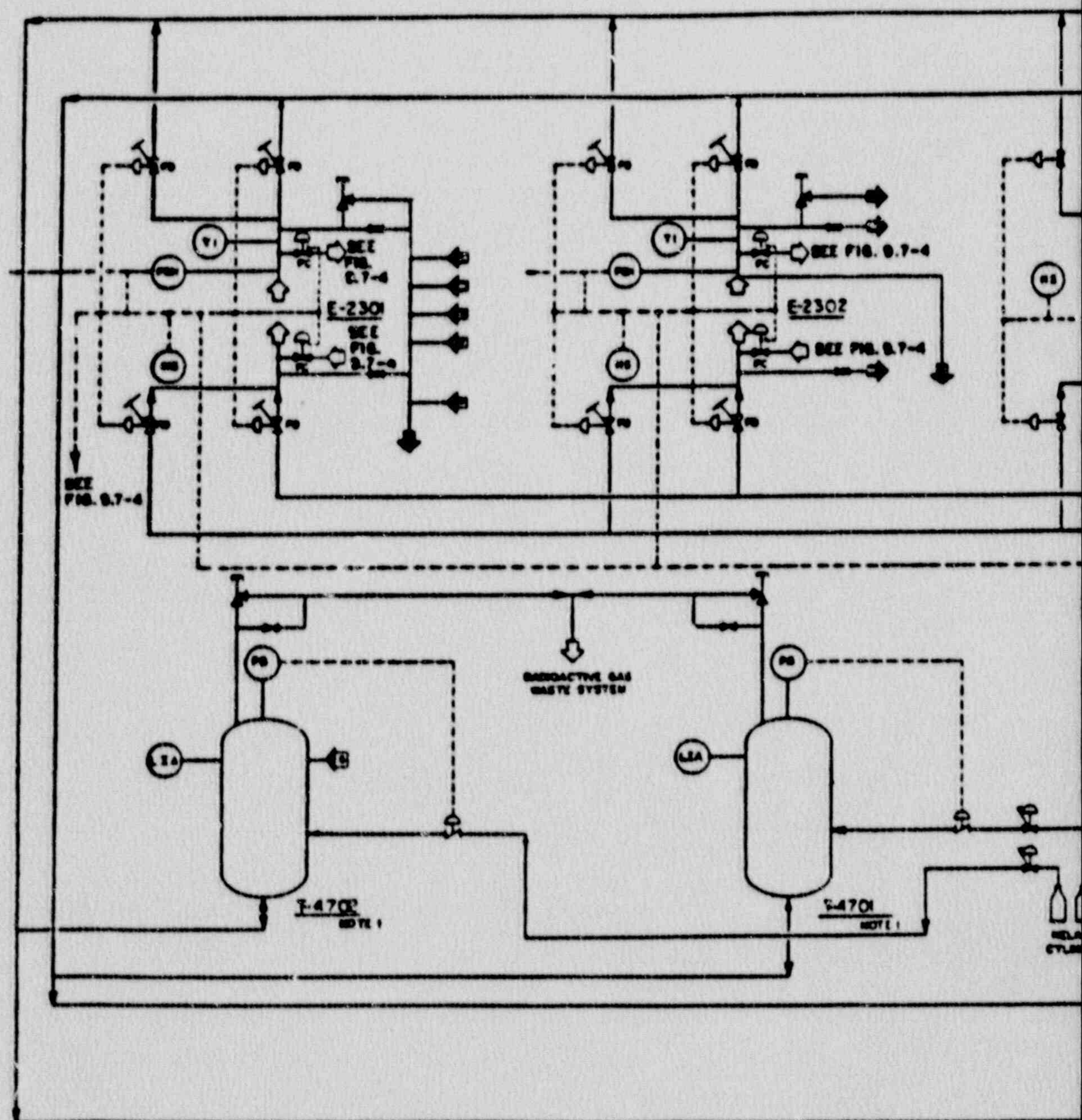
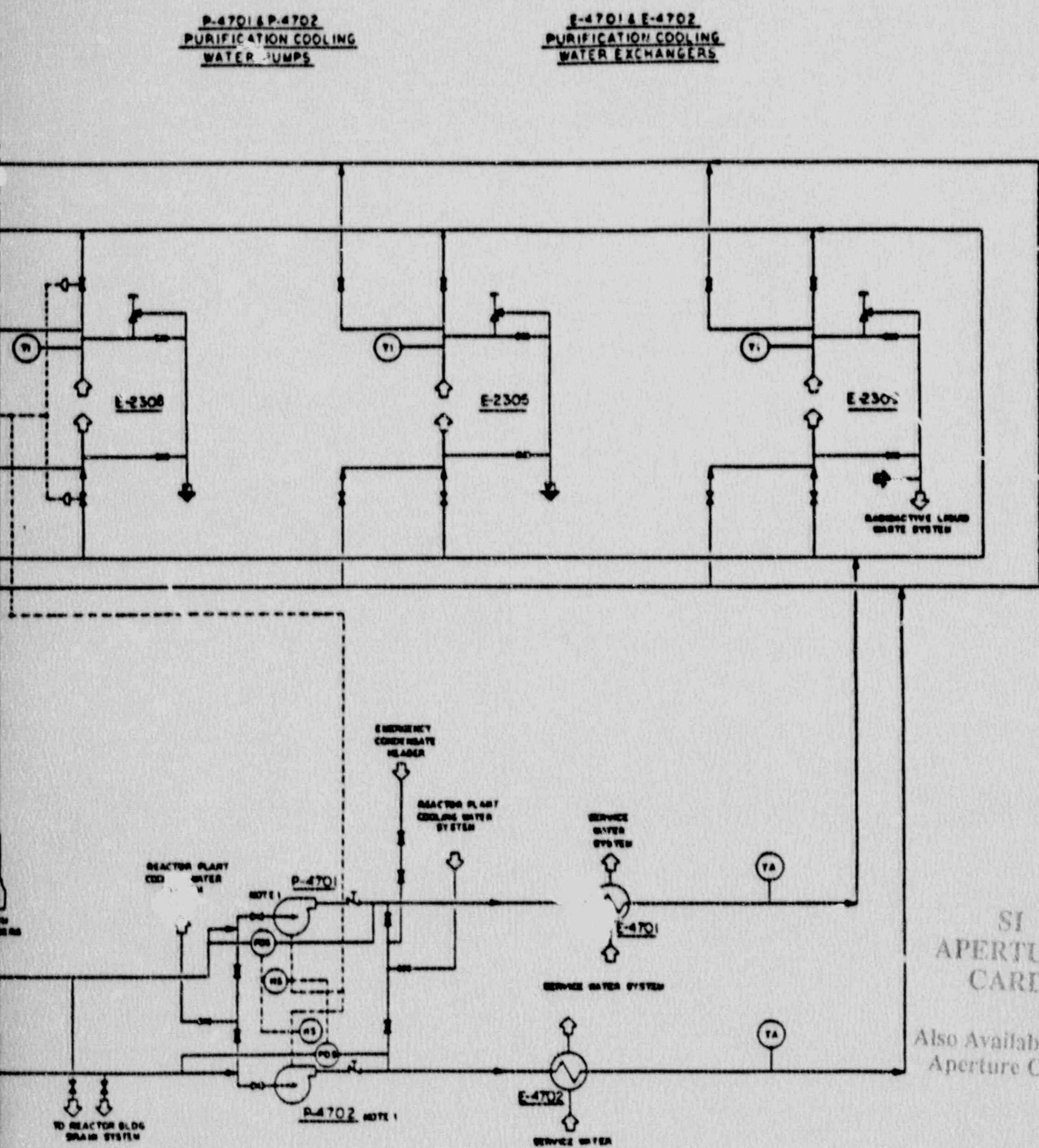


Figure 2.2-20 Reactor Plant Cooling Water System (System 46)

T-4701 & T-4702
PURIFICATION COOLING WATER
EXPANSION TANKS



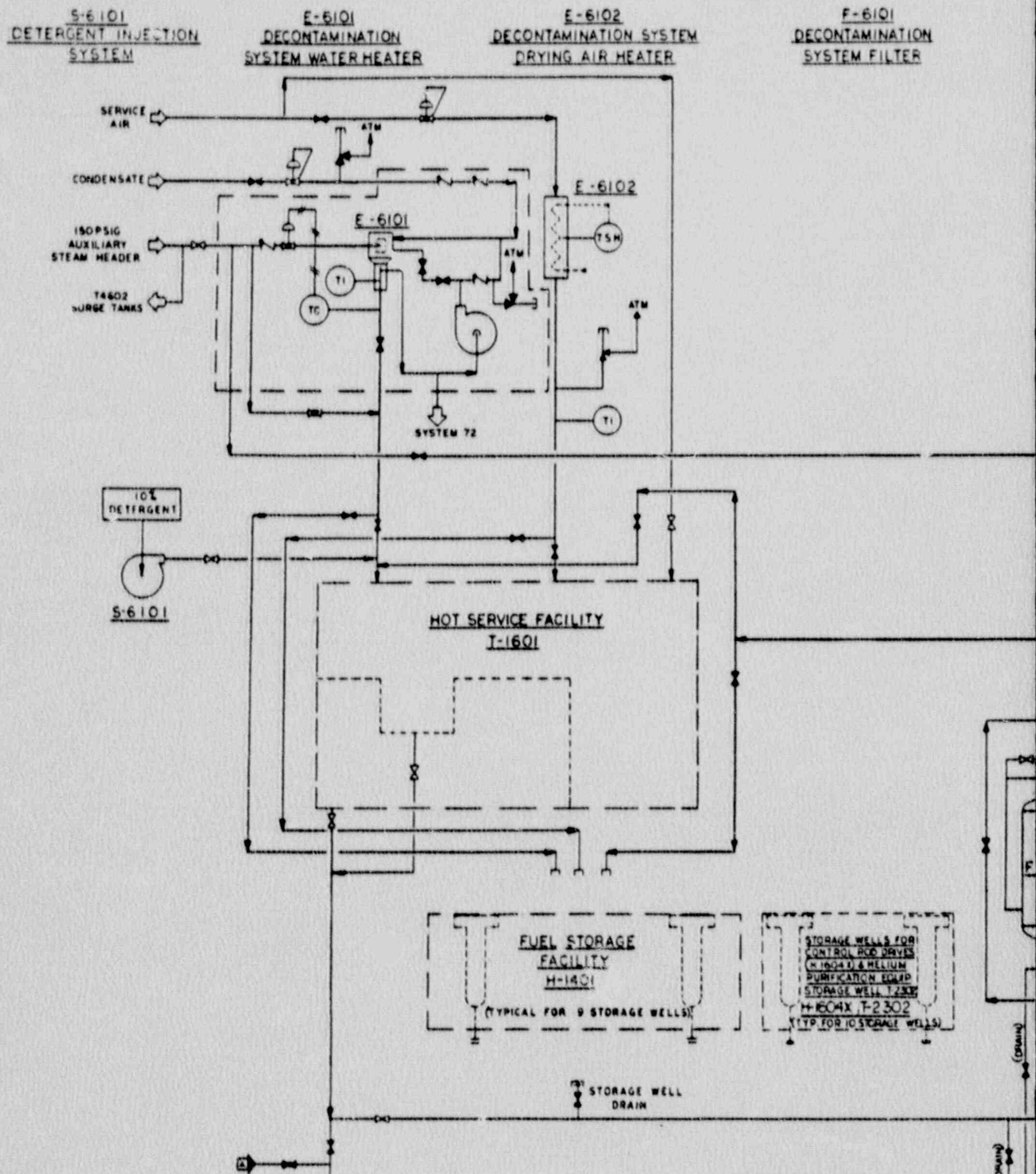


SI
APERTURE
CARD

Also Available On
Aperture Card

9011090214-08

Figure 2.2-21 Purification Cooling
Water System
(System 47)


S-6101
DETERGENT INJECTION SYSTEM
E-6101
DECONTAMINATION SYSTEM WATER HEATER
E-6102
DECONTAMINATION SYSTEM DRYING AIR HEATER
F-6101
DECONTAMINATION SYSTEM FILTER
SERVICE AIR
CONDENSATE
150 PSIG AUXILIARY STEAM HEADER
T4602 SURGE TANKS
ATM
E-6101
E-6102
TSH
TI
TC
SYSTEM 72
10% DETERGENT
S-6101
HOT SERVICE FACILITY
T-1601
FUEL STORAGE FACILITY
H-1401
(TYPICAL FOR 9 STORAGE WELLS)
STORAGE WELLS FOR CONTROL ROD DRIVES (H-1604X) & HELIUM PURIFICATION EQUIP. STORAGE WELL T-2302
H-1604X, T-2302
(TYP FOR 10 STORAGE WELLS)
STORAGE WELL DRAIN
(DRAIN)

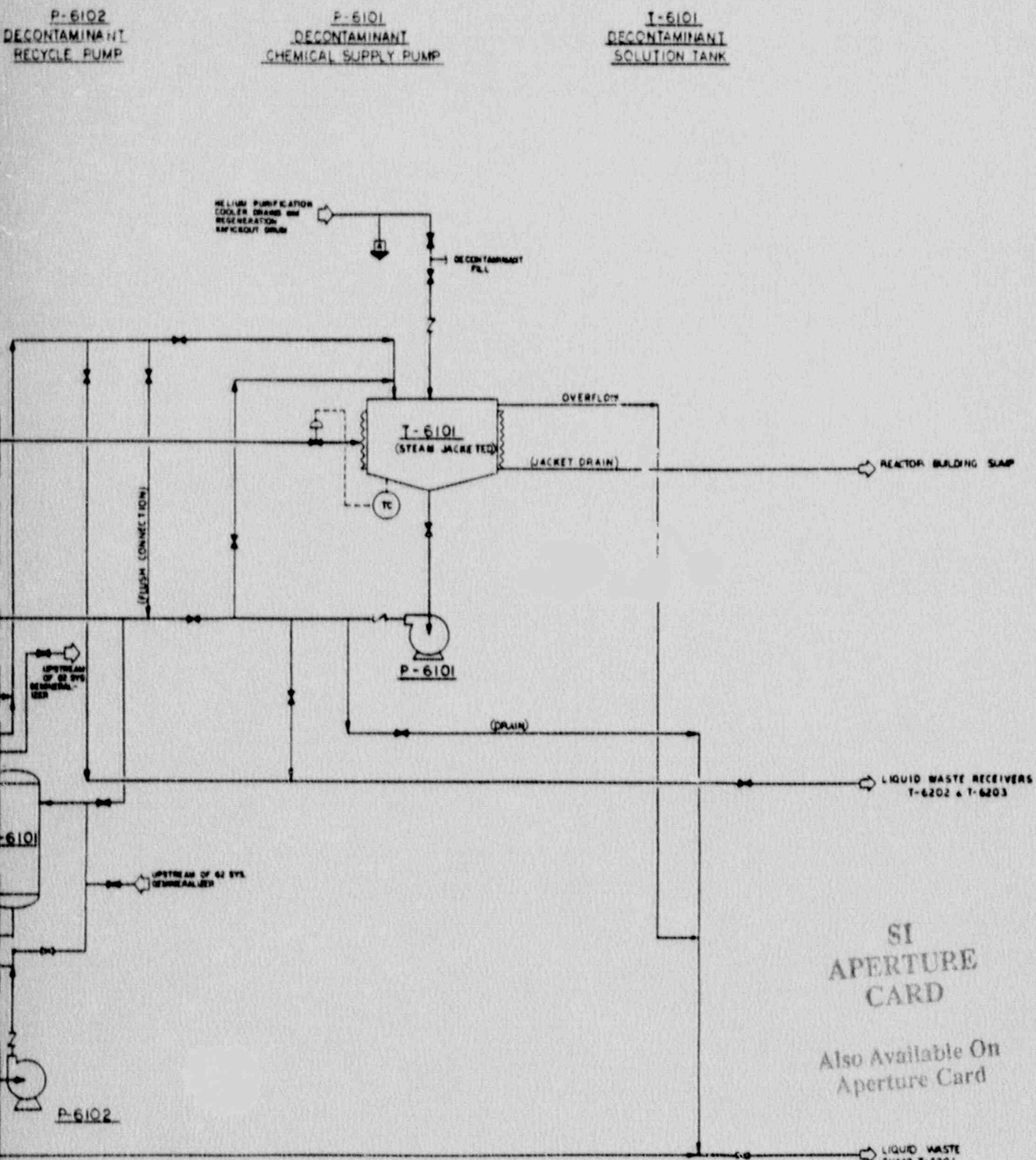
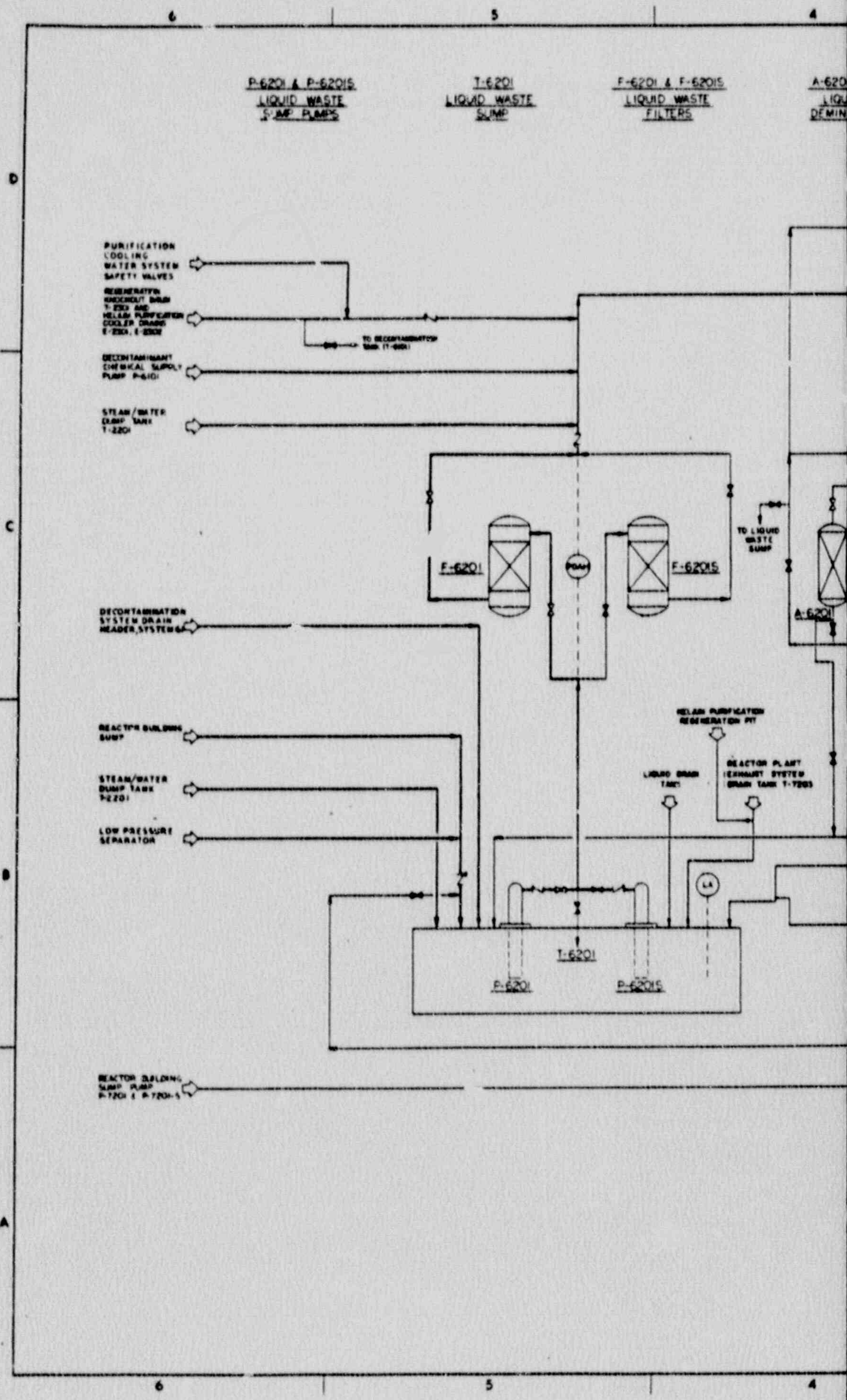


Figure 2.2-22 Decontamination
System (System 61)

9011090314-09


6
5
4
P-6201 & P-62015
LIQUID WASTE
SUMP PUMPS
T-6201
LIQUID WASTE
SUMP
F-6201 & F-62015
LIQUID WASTE
FILTERS
D
C
B
A
PURIFICATION
COOLING
WATER SYSTEM
SAFETY VALVES
DECONTAMINANT
CHEMICAL SUPPLY
PUMP P-6101
STEAM/WATER
DUMP TANK
T-2201
F-6201
F-62015
TO LIQUID
WASTE
SUMP
A-6201
REACTOR BUILDING
SUMP
STEAM/WATER
DUMP TANK
T-2201
LOW PRESSURE
SEPARATOR
REACTOR PLANT
EXHAUST SYSTEM
T-6201
P-6201
P-62015
LA
REACTOR BUILDING
SUMP PUMP

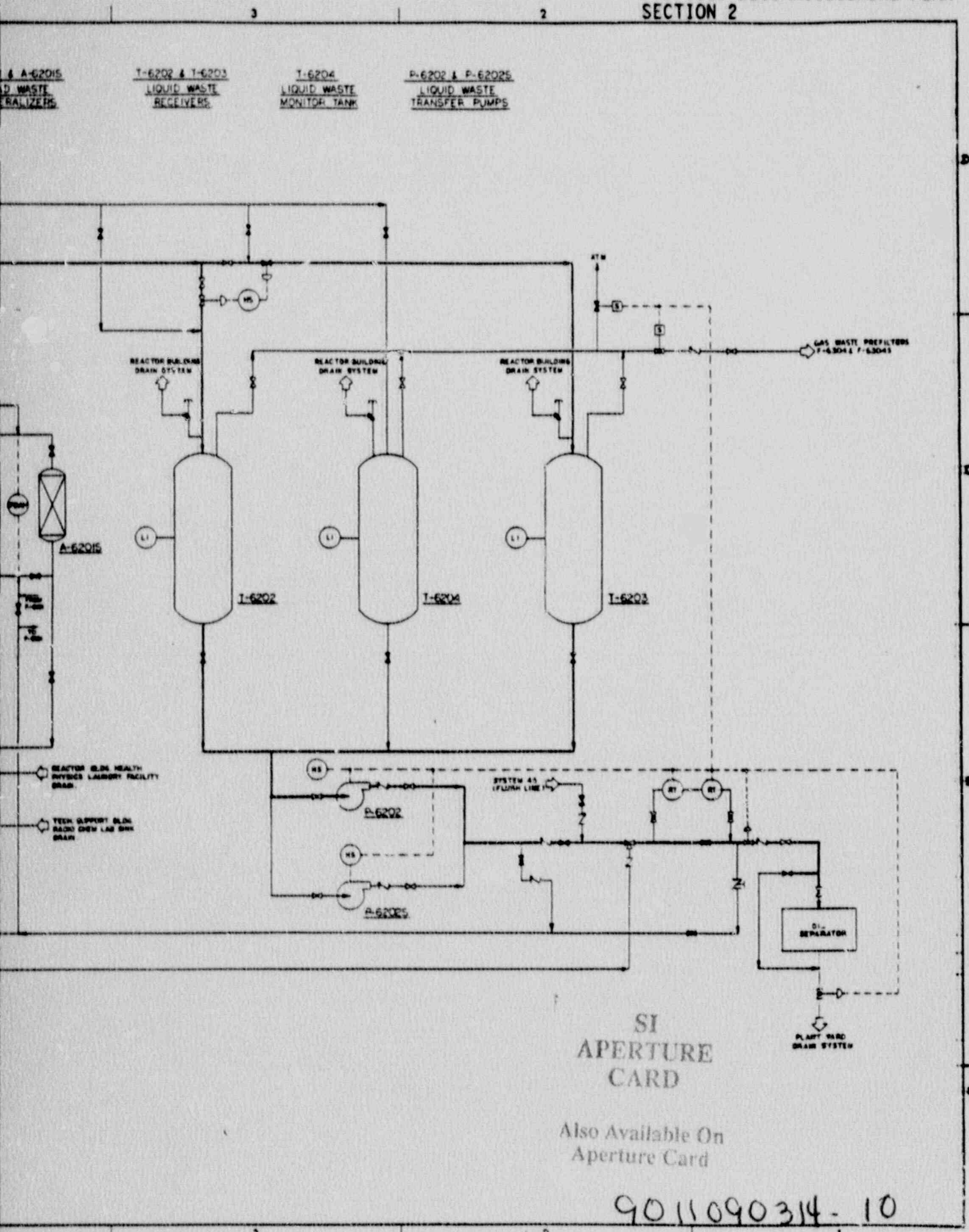
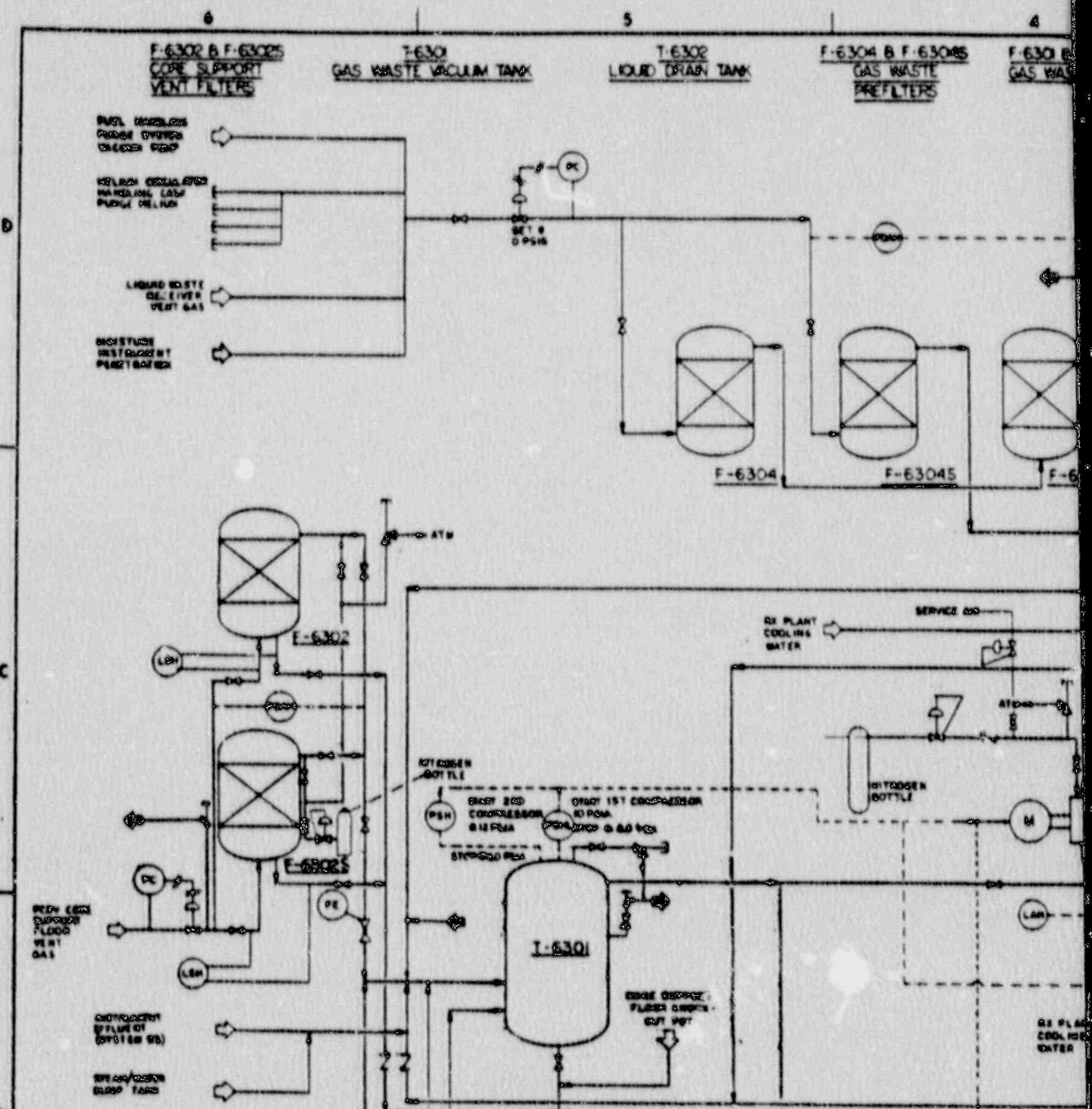


Figure 2.2-23 Radioactive Liquid
Waste System
(System 62)



F-6302 & F-6302S
CORE SUPPORT
VENT FILTERS
T-6301
GAS WASTE VACUUM TANK
T-6302
LIQUID DRAIN TANK
F-6304 & F-6304S
GAS WASTE
PREFILTERS
F-6304
F-6304S
F-6302
F-6302S
T-6301
T-6302
LOOP SEAL
RX BUILDING DRAIN SYSTEM
RX PLANT COOLING WATER
SERVICE AIR
NITROGEN BOTTLE
C1 INSTRUMENT PENETRATION VENT
FAST GAS SAMPLE & IODINE MONITOR
FAST GAS SAMPLE
MOISTURE MONITOR PENETRATION VENTS
NOTES
1. HIGH RADIATION SIGNAL FROM THE BLDG VENTILATION SYSTEM EXHAUST DIVERTS FLOW TO VACUUM TANK

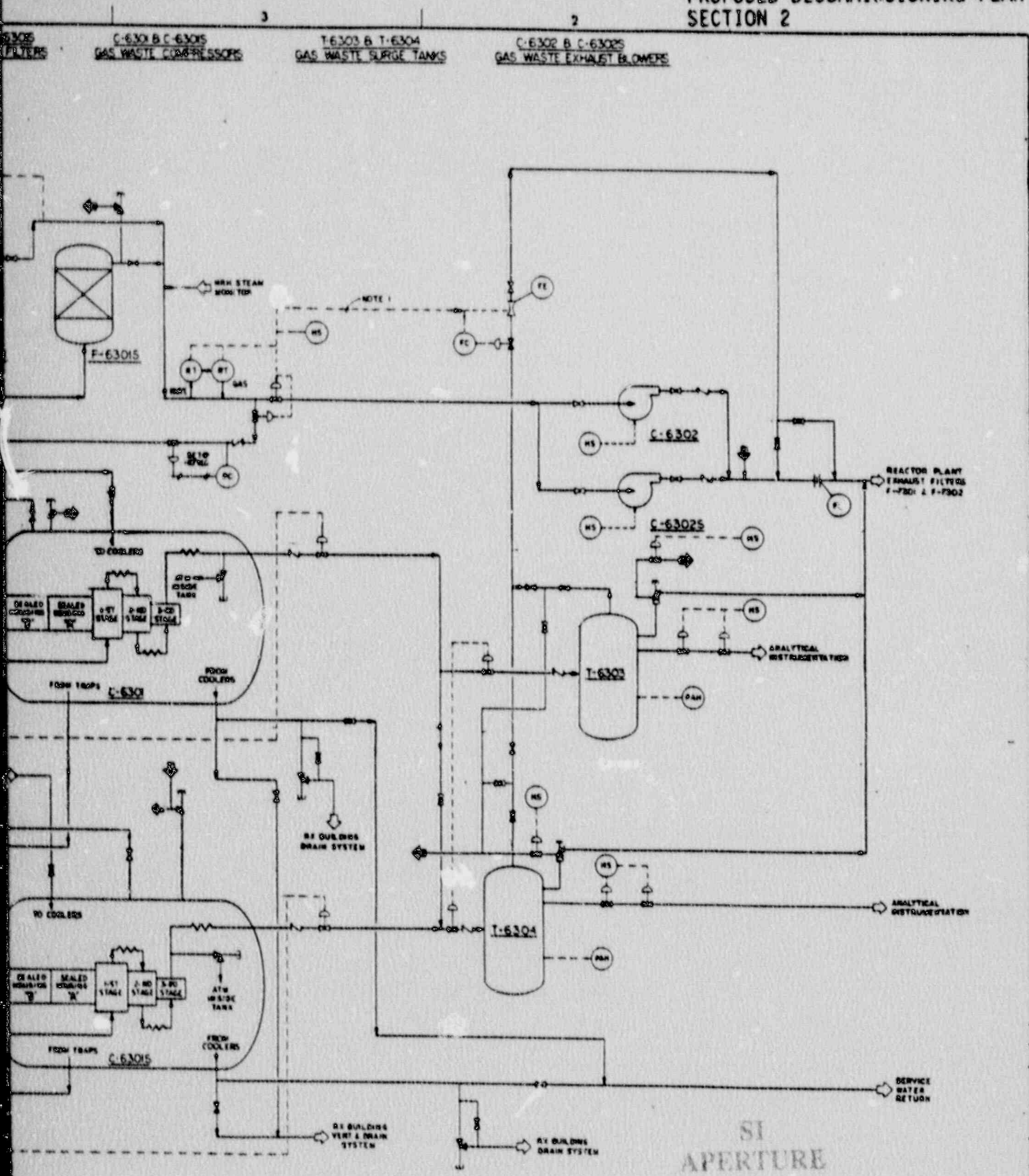
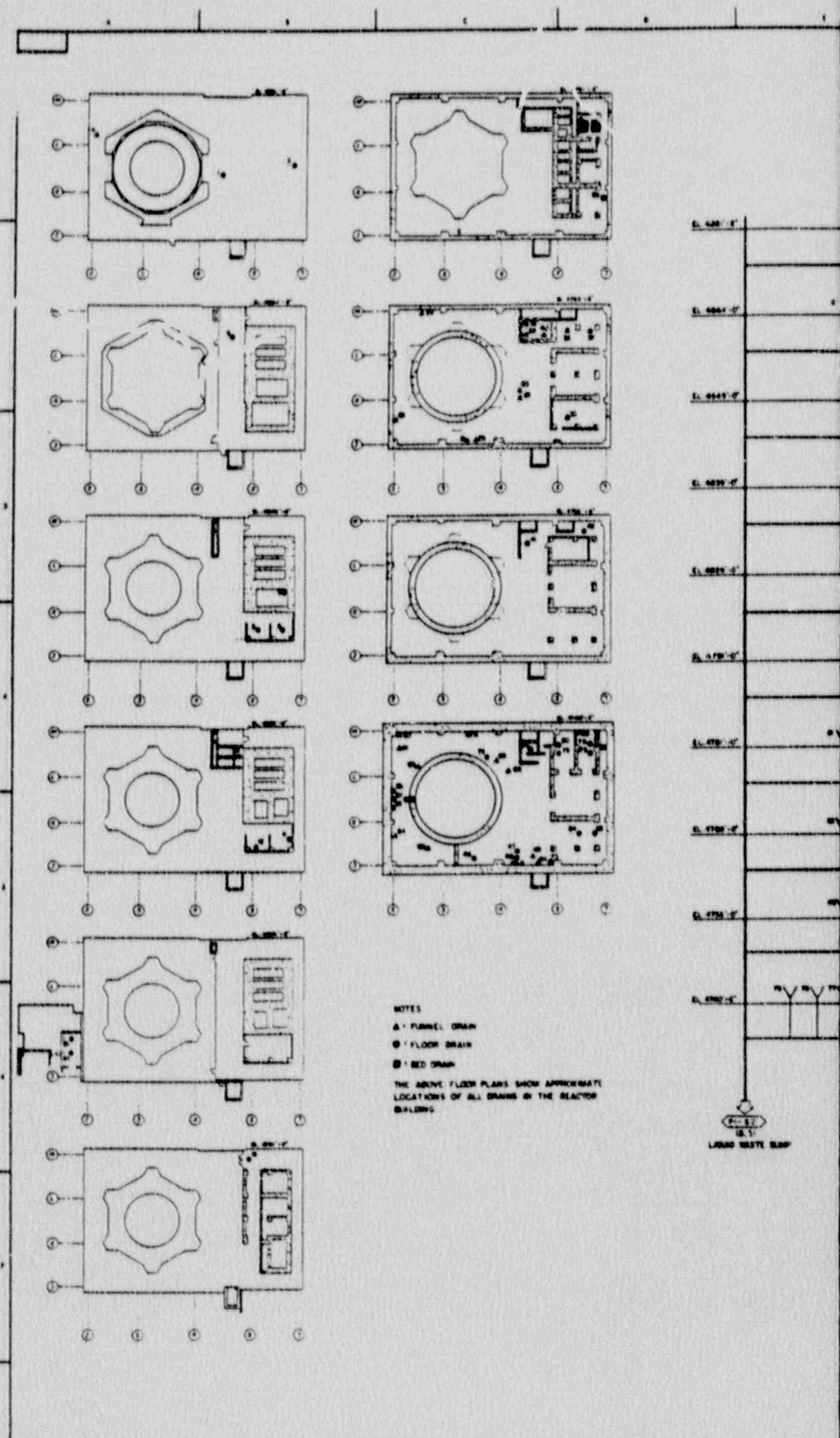
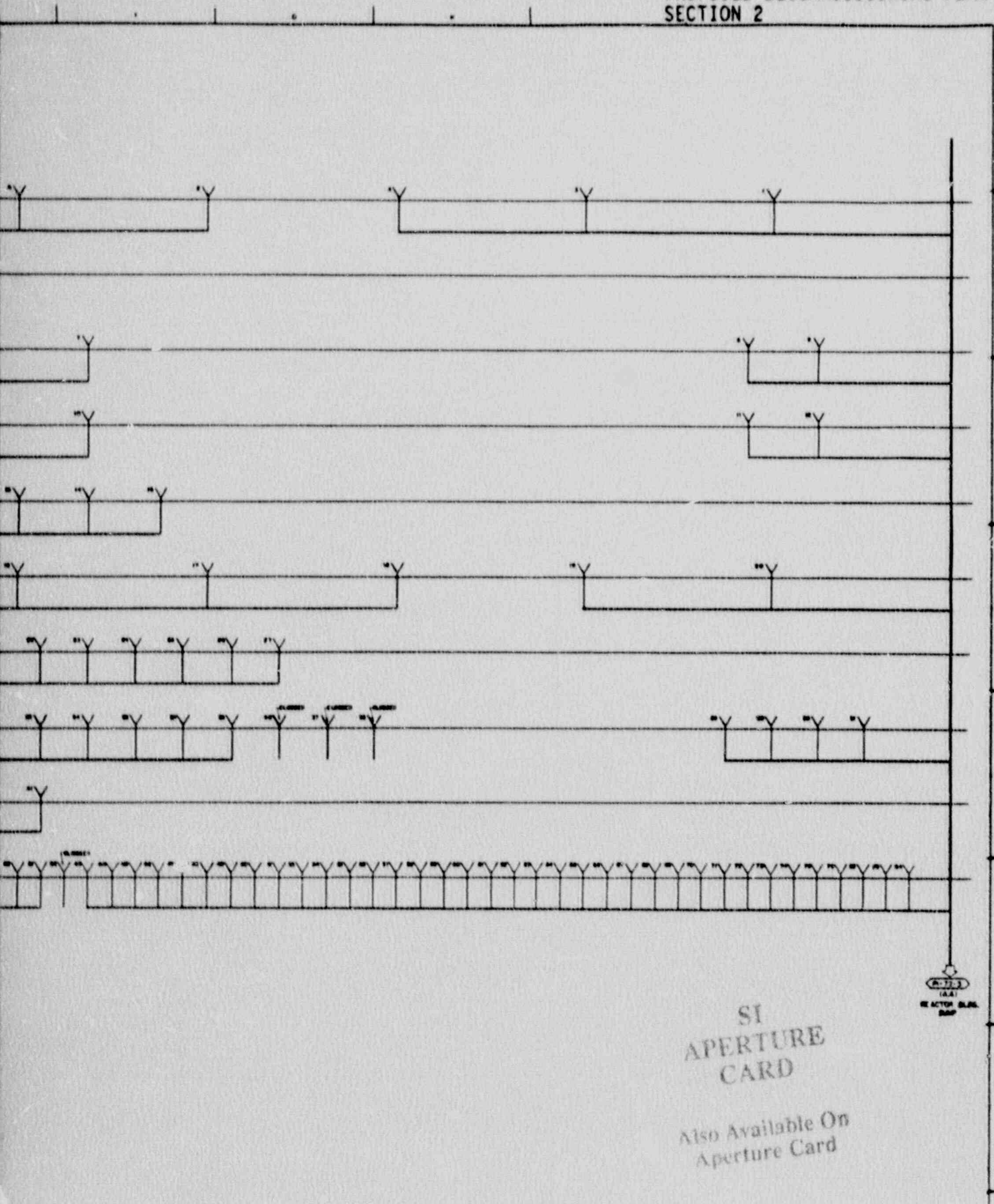


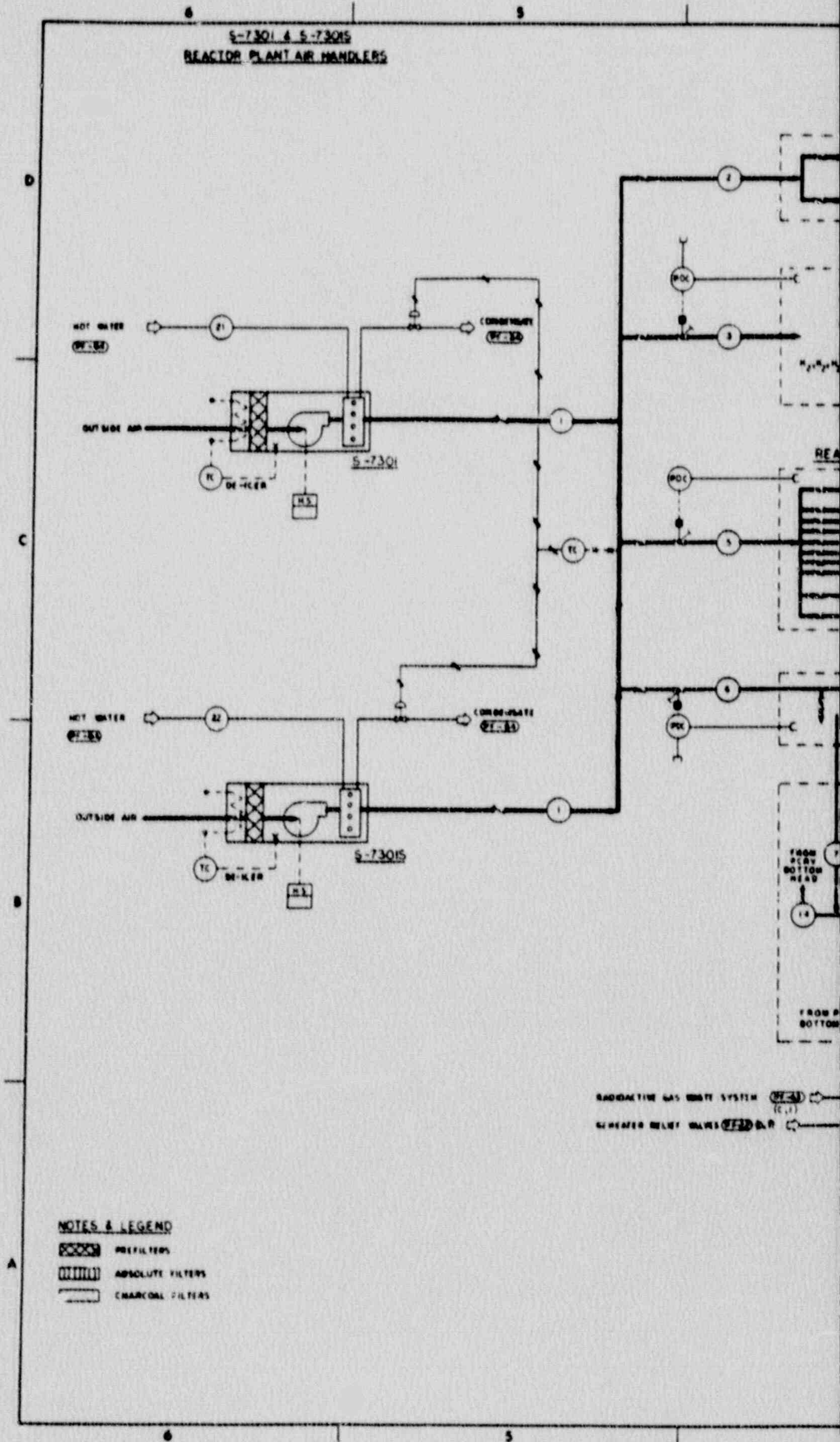
Figure 2.2-24 Radioactive Gas
Waste System
(System 63)


NOTES
▲ = FUNNEL DRAIN
● = FLOOR DRAIN
■ = BED DRAIN
THE ABOVE FLOOR PLANS SHOW APPROXIMATE LOCATIONS OF ALL DRAINS IN THE REACTOR BUILDING
LIQUID WASTE SUMP



9011090314.12

Figure 2.2-25 Reactor Building Drain System (System 72)



S-7301 & S-7301S
REACTOR PLANT AIR HANDLERS
HOT WATER
OUTSIDE AIR
S-7301
S-7301S
NOTES & LEGEND
PREFILTERS
ABSOLUTE FILTERS
CHARCOAL FILTERS

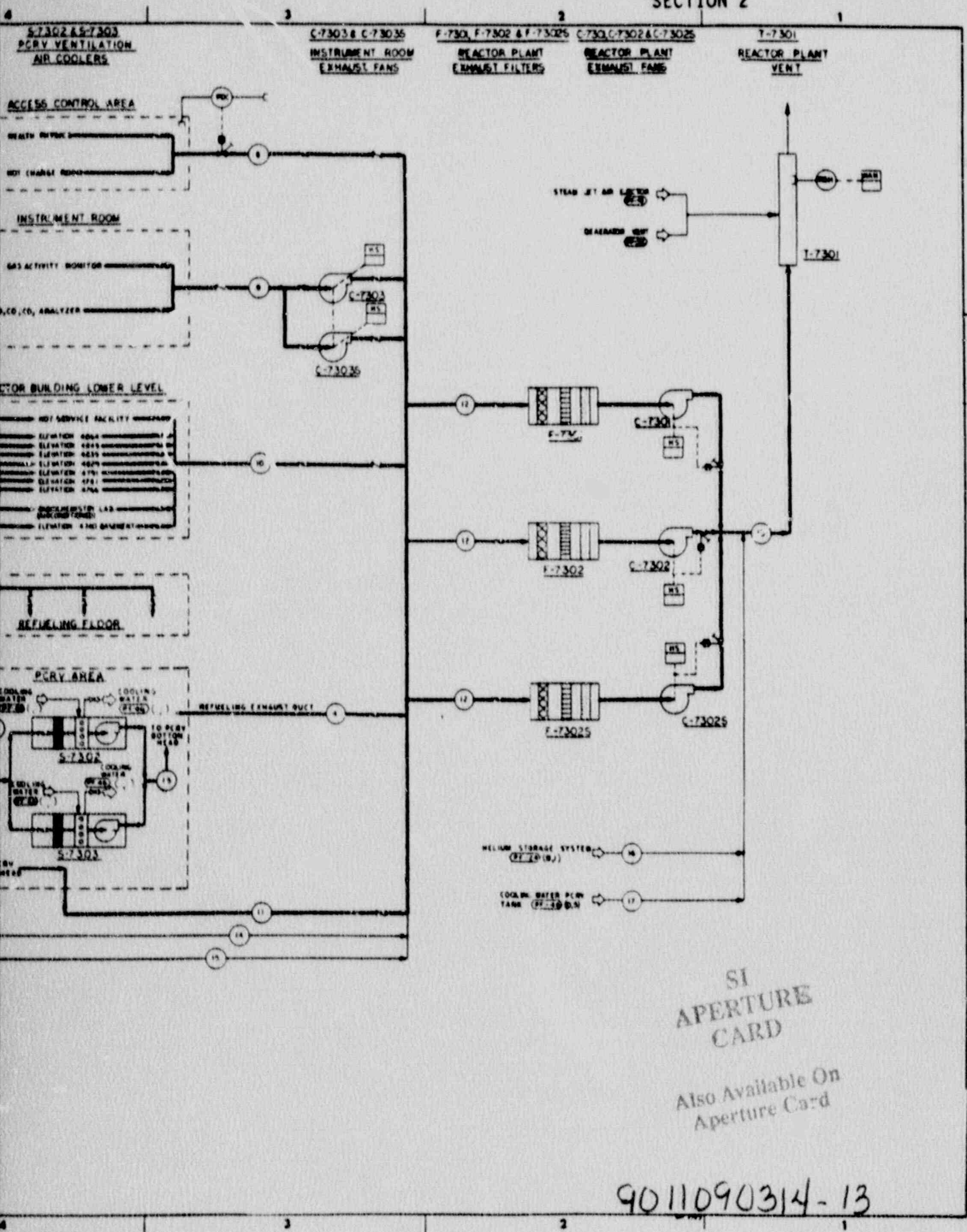


Figure 2.2-26 Reactor Building
Ventilation System
(System 73)

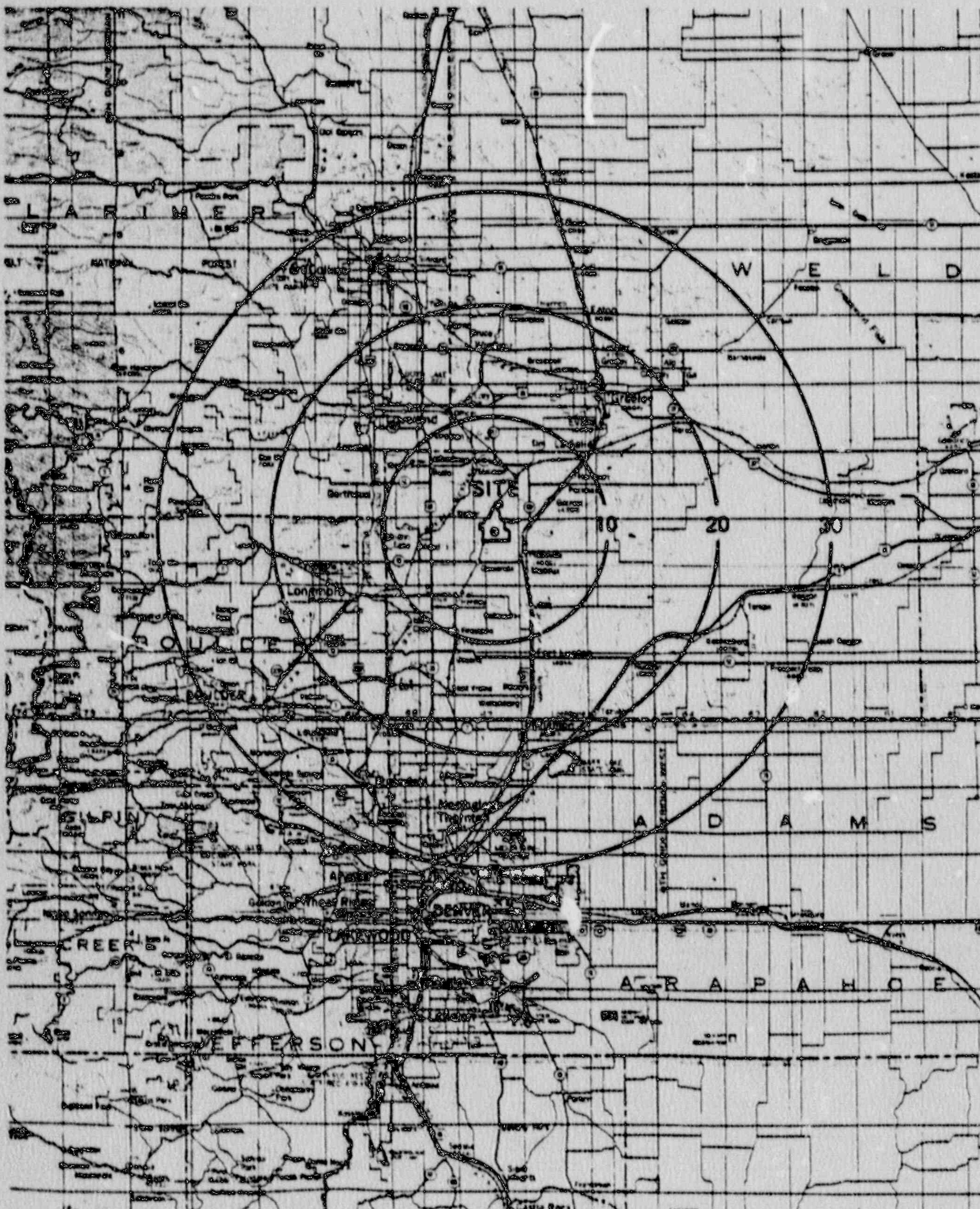


Figure 2.2-27 Area Within Thirty Miles of Fort St. Vrain

Figure 2.2-28 Subsurface Geology Surrounding the Site

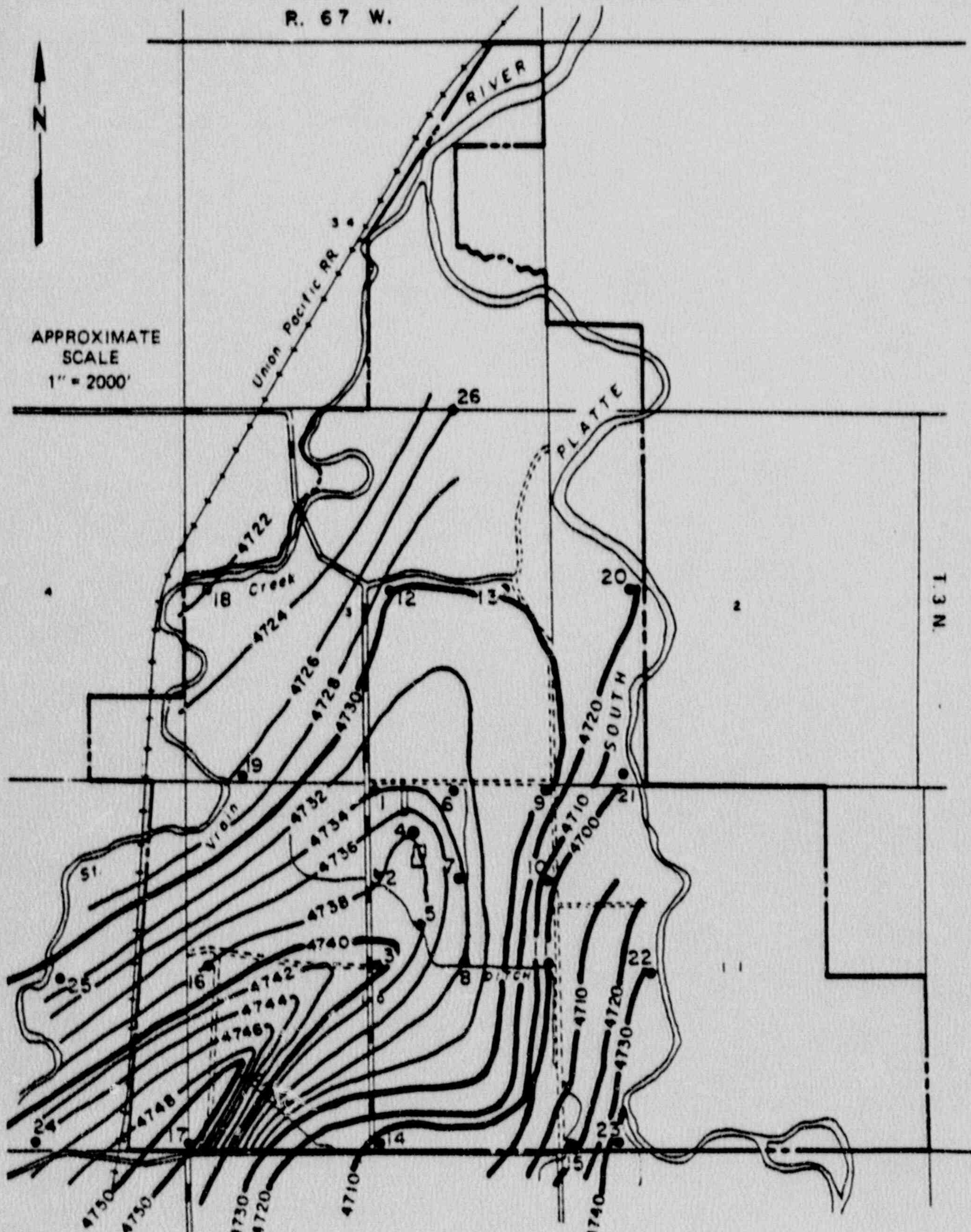


Figure 2.2-29 Estimated Bedrock Contours

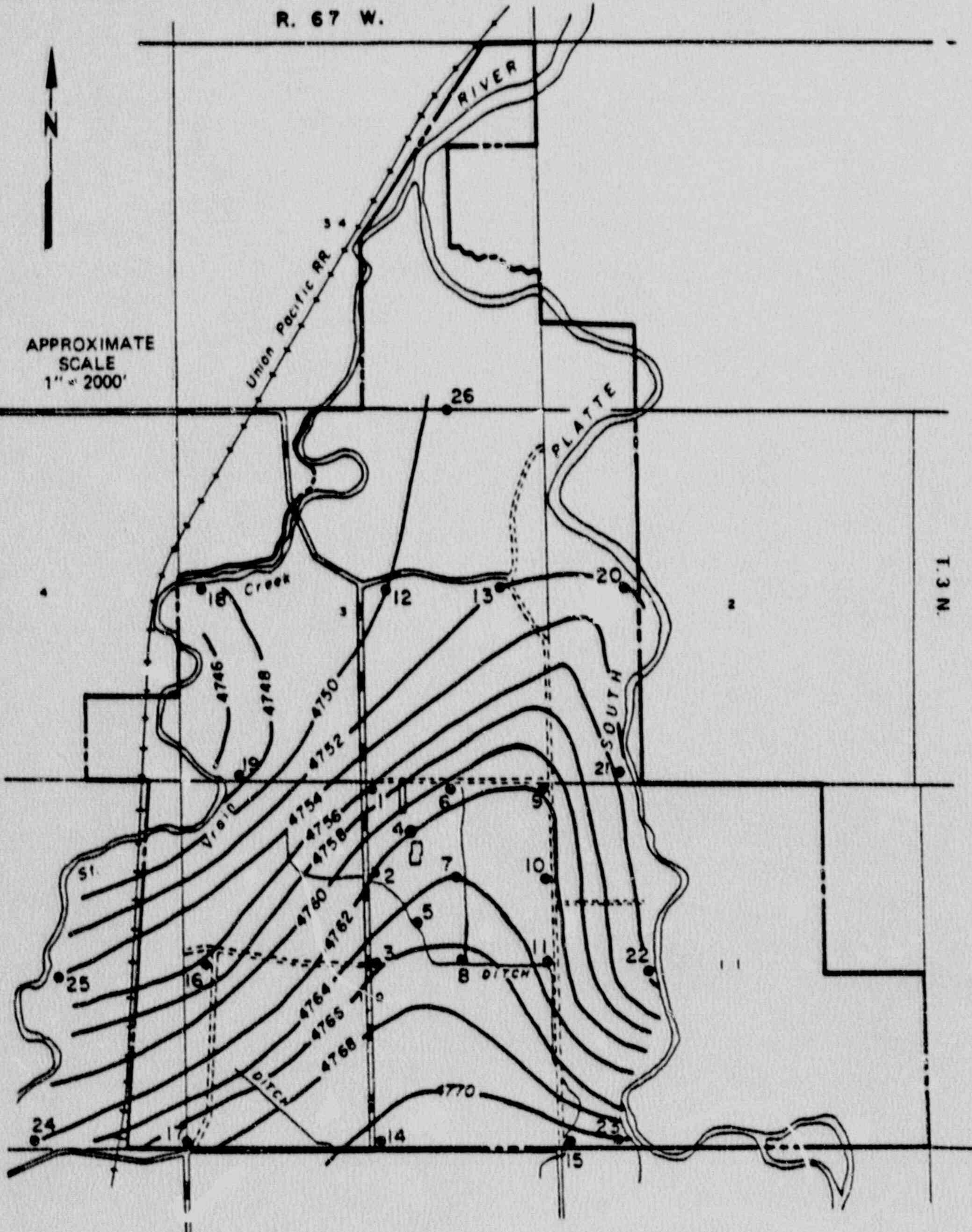


Figure 2.2-30 Estimated Water Table Contours

Major Tributaries and Irrigation Ditches of the South Platte River

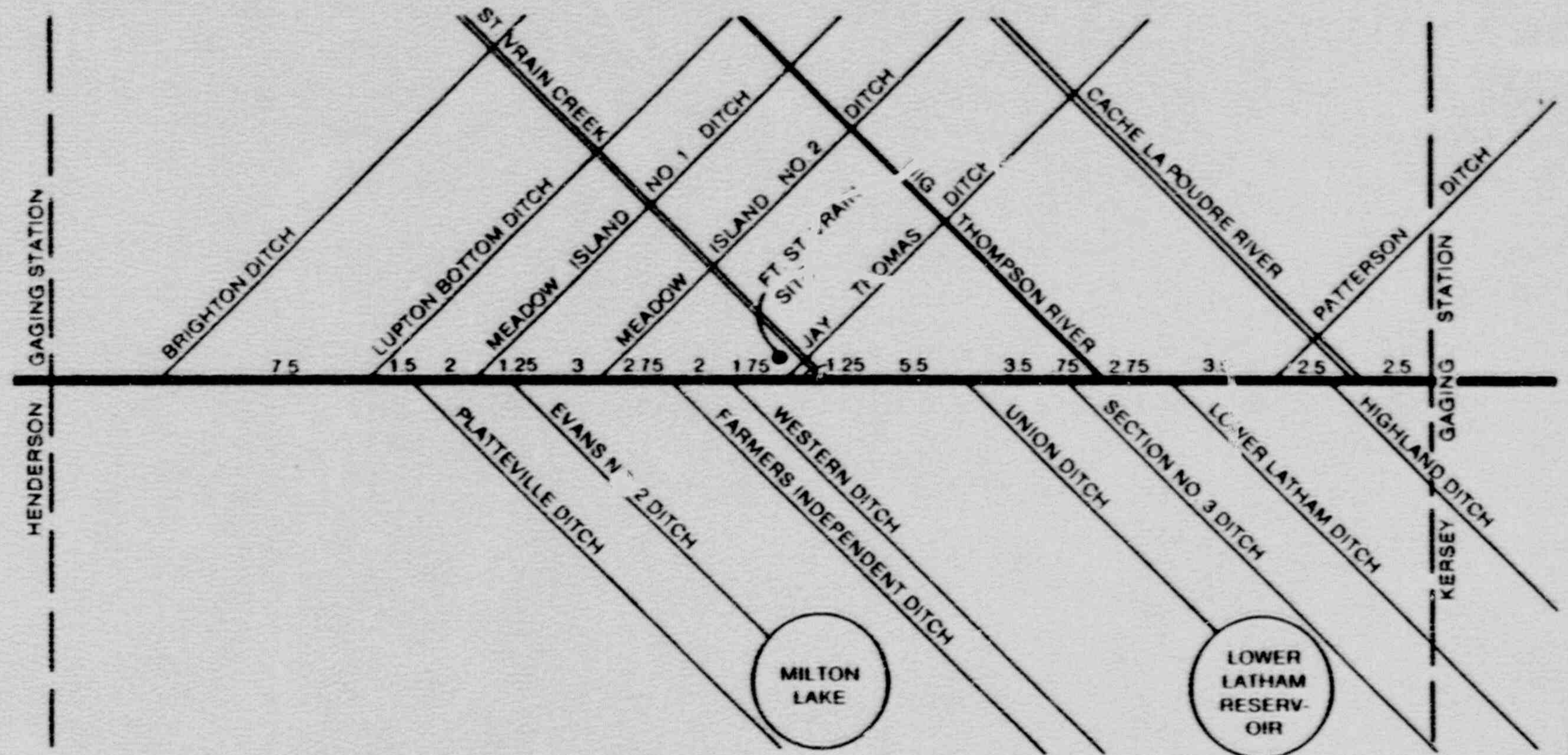


Figure 2.2-31 Major Tributaries and Irrigation Ditches

2.3 DECOMMISSIONING ACTIVITIES, PLANNING AND EXPOSURE ESTIMATES

2.3.1 Introduction

Decommissioning of Fort St. Vrain includes the dismantlement, decontamination and disposal of radioactively contaminated or potentially contaminated material and components within the PCRV, and n contaminated or potentially contaminated balance of plant systems, and on the remaining site, followed by the final radiation survey. Some of the activities described in this section will be performed prior to approval of the Proposed Decommissioning Plan, and are considered plant closure activities in preparation for decommissioning (see Section 1.5).

A description of the facility and site characteristics is provided in Section 2.2. The activated and contaminated portions of Fort St. Vrain which will be decontaminated, dismantled and removed during the decommissioning process are identified in Sections 2.2, 2.3 and 3.1. The specific tasks to be performed to accomplish this goal are discussed in this section. Although personnel conducting the dismantling activities will be exposed to radiation above background levels, the dismantling and decontamination activities have been developed to limit exposure to and control radioactive material in order to maintain occupational doses as low as reasonably achievable (ALARA). Exposure estimates to accomplish the individual tasks and overall project are also provided.

To accomplish the decommissioning of Fort St. Vrain, substantial portions of the existing plant will be dismantled and removed. However, Reactor and Turbine Building components and structures which are not radioactive above releasable limits will remain.

The decommissioning project is divided into three major work areas:

1. Decontamination and dismantlement of the PCRV.
2. Decontamination and dismantlement of the contaminated or potentially contaminated balance of plant systems.
3. Site cleanup and final site radiation survey.

Site cleanup involves pre- and post-decommissioning surveys of the site, and the radiological decontamination necessary to meet the regulatory guidelines to allow release for unrestricted use. These activities are discussed in detail in Section 4 and are not addressed in this section.

PCRV Decontamination and Dismantlement Activities

The following are the major activities involved in dismantling and removing the radioactive portions of the PCRV. These activities will be discussed in further detail in the following Section 2.3.3:

1. Initial PCRV Preparation
2. Steam Generator Disassembly
   a. Initial Preparation
   b. Removal of Steam Generator Secondary Assembly
3. Removal of Activated Components using the ATC and FHM
4. Detensioning and Removal of Pretensioned Tendons
5. Flooding of the PCRV
6. PCRV Top Head Concrete and Liner Removal
7. Dismantling PCRV Core Components
8. Removing the Core Barrel
9. Removal of the Core Support Floor
10. Disassembling the PCRV Lower Plenum
11. Final Dismantling, Decontamination, and Cleanup Activities

A technical evaluation is provided in Section 2.3.2 which provides the basis for the technical approach selected to decontaminate and dismantle the PCRV. A brief description is also provided to identify various techniques which were considered for removal of the PCRV activated concrete.

Balance of Plant System Decontamination and Dismantlement Activities

The balance of plant systems that are contaminated or potentially contaminated above releasable limits and may require decontamination or dismantlement are identified in Section 2.2.3. Work activities associated with these systems are discussed in paragraph 2.3.4 of this section.

2.3.2 Technical Approach Selection

2.3.2.1 Options Considered for Removal of the PCRV

Key elements of the decommissioning plan include the techniques to be used to remove the internal components from the PCRV and to remove the activated concrete from the PCRV structure. This technical approach is based on filling the PCRV with water for shielding while internal components are being removed and using diamond-wire cutting to remove the activated concrete from the PCRV structure. These methods provide the decommissioning project with the optimum schedule, cost, ALARA, risk, and safety considerations

for decommissioning the PCRV. A detailed description of the PCRV disassembly techniques and the basis for selecting them are described below.

Two basic methods to disassemble the PCRV were considered: (1) in-air (dry) disassembly, and (2) filling the PCRV with water to provide shielding. Two possible methods of in-air dismantlement were also evaluated, considering factors of ALARA, safety, risks, schedule and cost. The two in-air methods evaluated were fully remote disassembly through the refueling penetrations in the top head, and partially remote disassembly from a massive shielded work platform with the top head removed. The following paragraphs provide an evaluation of each method, discussion of advantages and disadvantages, and a determination of its acceptability.

2.3.2.1.1 Fully Remote, In-Air Disassembly:

The fully remote, in-air approach to the PCRV disassembly relied upon the extensive use of complex remote tooling and resultant limited view of dismantlement operations, which would produce less than predictable results. Although use of remote operations would potentially result in the best ALARA and safety records, all activities would be performed with highly specialized robots. Therefore, the risk of failure or project delays would be greater due to potential breakdowns or delays, lack of reliable backup techniques, and lack of adequate contingency plans. Design, fabrication and testing of specialized robotics would also have to occur in a relatively short period of time, which could cause unnecessary delays in the project schedule. Additionally, removal of the CSF would be extremely difficult, since it is too massive (270 tons) for practical remote removal.

2.3.2.1.2 Partially Remote, In-Air Disassembly:

Partially remote in-air disassembly of the PCRV relied upon a massive shielded work platform that would be required to protect workers from radiation exposure during disassembly. Access ports would be required in this platform through which hand-held, pole-type tools could be inserted to perform the disassembly when the platform is properly indexed over the work location. Using this approach, radiation exposure would be increased because of the extended stay times resulting from restricted tool access. Removal of the top head and the top of the PCRV liner for installation of the work platform would be difficult because of high radiation levels and would probably require remote operations.

2.3.2.1.3 <u>Flooding the PCRV:</u>

The final approach evaluated was to flood the PCRV cavity with water. This selected approach will provide optimum shielding and contamination control and will allow the PCRV disassembly to be completed with optimum balance of schedule, cost, ALARA exposure and minimum risks. Additionally, there is an inherent added measure of safety due to the passive nature of the water for shielding and contamination control. Dismantling operations are greatly simplified by "line of sight" manipulations as a result of direct viewing of the entire cavity.

2.3.2.1.4 <u>Conclusion:</u>

The evaluation of the two "dry" (in-air) approaches against the "wet" approach for PCRV disassembly favors filling the PCRV with water for shielding during disassembly. Additionally, it is noted that the "dry" techniques are not completely dry, since large volumes of water are required for any abrasive process used to cut the activated concrete inside the PCRV. Therefore, water would be introduced into the PCRV in each of the "dry" dismantlement options considered.

2.3.2.2 <u>Techniques Considered for Removal of Activated PCRV Concrete</u>

Diamond wire cutting and abrasive water-jet cutting were evaluated for removing activated concrete from the PCRV walls. Diamond wire cutting was chosen as the method for cutting most of the concrete into sections because this proven technology lends itself well to the PCRV concrete removal activities.

Abrasive water-jet cutting was determined to be feasible for much of the concrete cutting but has been minimized to limit the production of contaminated abrasive waste and because of related ALARA considerations. The abrasive water-jet is presently being considered for one application, cutting of the CSF.

The following techniques were also evaluated and were determined to be less desirable for removal of activated PCRV concrete for the following reasons (these techniques may be used for other applications during the decommissioning project): (1) Expanding grout and explosives could be used to break apart the PCRV concrete, but were less desirable because of the heavy reinforcement of the concrete and the presence of the PCRV liner on the face of the concrete; (2) Thermal techniques were evaluated but were less

desirable due to tool positioning difficulties, which could cause cost and schedule concerns; (3) Mechanical impact was evaluated but was less desirable due to structural considerations (with the exception of removal of portions of the lowest concrete in the top head).

2.3.3 PCRV Dismantlement and Decontamination

2.3.3.1 Overview of PCRV Dismantlement Activities

The major decommissioning task is the dismantlement and decontamination of the radioactive portions of the PCRV. A description of the PCRV is provided in Section 2.2 and illustrated on Figure 2.2-6. It should be noted that the steps identified in the following paragraphs represent preliminary planning and may change during the detailed engineering and work development that will occur during the planning phase.

This section provides a description of the expected steps necessary to dismantle and decontaminate the PCRV. Initial dismantlement of the PCRV will include removal of selected PCRV internal components and removal of portions of the steam generators. The selected internal PCRV components will be removed from the upper portion of the PCRV using the fuel handling machine (FHM) and Auxiliary Transfer Cask (ATC). These components may include the 37 control rod metal clad reflector blocks (MCRBs), 270 non-control rod hexagonal MCRBs, and certain helium purification components. Simultaneously, the non-contaminated portion of the steam generators (also called the steam generator secondary assemblies) will be removed from the lower portion of the PCRV to provide access for detachment of the contaminated steam generator primary assemblies (See Figure 2.2-6).

To facilitate the removal of the remaining reactor core components, the reactor cavity will be flooded with water. As discussed in Section 2.3.2, flooding the PCRV will provide shielding for the workers associated with PCRV dismantlement activities. After the steam generator secondary assemblies are removed from the bottom of the PCRV, the PCRV bottom head and side wall penetrations will be sealed, a water cleanup and clarification system will be connected, and the PCRV will be flooded.

To gain entry to the PCRV cavity, a plug of concrete will be removed from the top head of the PCRV. Selected PCRV prestressing tendons (See Figure 2.2-6) will be detensioned or removed. The top head plug will be cut into sections of appropriate size such that the

weight and dimensions will allow them to be handled with the Reactor Building crane and permit them to be moved out of the building. After the majority of the concrete has been removed from the PCRV top head, the 3/4-inch steel PCRV liner plate will be cut and removed with the remaining concrete, together with the top head liner insulation. A detailed discussion of this activity is provided in Section 2.3.3.7.

Once access is gained to the PCRV cavity, a work platform will be installed at the approximate elevation of the top of the PCRV where the liner and concrete have been removed. Working from this platform, workers will remove core components, including the remaining MCRBs, defueling elements, hexagonal reflector blocks, large side reflector blocks, side spacer blocks, core support blocks and core support posts. This activity is described in Section 2.3.3.8.

Once the core internals have been removed, the core barrel (a large carbon steel cylinder) will be removed by cutting it into pieces sized to fit in radwaste containers. (See Section 2.3.3.9)

Following removal of the core barrel, the PCRV water level will be lowered and the CSF insulation removed, in preparation for removal of the CSF. The CSF is a 30-foot diameter, 5-foot thick disk of reinforced concrete within a 3/4-inch steel casing weighing approximately 270 tons. The CSF will be segmented into manageable pieces and removed using the Reactor Building crane. To segment the CSF and separate it from the CSF columns and the helium ducts, a variety of cutting techniques (including plasma torches, abrasive water jet, diamond-wire saw and core boring) will be used as appropriate. This activity is discussed in Section 2.3.3.10.

Once the CSF is removed, the PCRV lower plenum is exposed and the helium circulator diffusers and steam generator primary modules can be removed. These activities are discussed in Section 2.3.3.11.

The removal of the steam generator primary assemblies completes the removal of the major PCRV radioactive components. Remaining radioactive components include the activated "beltline concrete" around the reactor core region, the PCRV liner, liner insulation and insulation cover plates, and the PCRV lower floor with its supports. The activated beltline concrete is the PCRV region that was adjacent to the reactor core. It is estimated that this activated region is defined by a cylinder with an 18 to 24 inch wall thickness and a height of 40 feet. This section of PCRV sidewall will be removed by cutting and removing vertical segments. The activated liner plate,

insulation and cover plates will be removed with the concrete. These activities are discussed in Section 2.3.3.12.

In the lower portion of the PCRV cavity (below the CSF), the insulation and insulation cover plates will be removed from the PCRV liner. The lower floor and all support members, insulation and other components will be removed, and the exposed PCRV liner will be surveyed and decontaminated as appropriate. These activities are also discussed in Section 2.3.3.12.

2.3.3.2 <u>Initial PCRV Preparation</u>

Initial tasks to be completed in preparation for dismantling the PCRV will include acquiring tooling, setting up training mockups, installation of the PCRV water cleanup and clarification system, and craft personnel training in accordance with Section 2.6.

Preparation activities include any modifications or revisions to existing facilities and equipment and installation of new facilities and equipment that would be necessary for their use in supporting the decommissioning operations. No major facility modifications are required that will affect the safety of the facility.

Preliminary plans involve enlarging the refueling deck equipment hatch and truck bay door to allow passage of larger items. Plans also include re-reeving of the Reactor Building crane to provide additional vertical travel which will allow the 170-ton main hook to travel from the refueling floor to ground level. This re-reeved configuration is consistent with the crane configuration used during original plant construction and is necessary to provide the lifting capacity to lift the PCRV top head concrete block sections and other heavy lifts when components are removed from within the PCRV.

The need for extensive waste handling facilities in addition to those already present has been minimized by proper sequencing of the dismantlement activities and by proper management of the radioactive waste program, as described in Section 3.3. Off-site facilities will be utilized when necessary and practical for waste processing and final packaging. Proper task planning and sequencing will aid in minimizing accumulation of radioactive waste onsite.

A self-contained mobile laundry facility to clean all contaminated protective clothing will be utilized. A water cleanup and clarification system, installed to maintain water purity in the flooded PCRV, will be discussed in Section 2.3.3.6.

Following helium circulator machine assembly removal, as identified in Section 1.5.2 (See Figure 2.3-1), each of the four helium circulator PCRV penetrations will be sealed by installing a closure fixture designed to withstand pressure when the PCRV is flooded with water.

2.3.3.3 Steam Generator Disassembly

2.3.3.3.1 Initial Steam Generator Disassembly

Each of the twelve steam generators consists of a primary assembly and a secondary assembly (Figure 2.3-2). The primary assembly is located within the PCRV lower plenum and the secondary assembly is located beneath the primary assembly inside a PCRV bottom head steam generator penetration. The primary assembly is contaminated and the secondary assembly is not expected to be contaminated. However, in order to remove the primary assembly, the secondary assembly must first be removed from beneath the PCRV.

The removal of the insulation from the steam generator secondary side piping will be limited to the sections of feedwater, main steam, hot reheat, and cold reheat piping that need to be severed for the steam generator secondary side removal. Prior to removal, the insulation will be tested for asbestos content. If asbestos is present, appropriate controls will be implemented for removal of the insulation. Following the removal of the insulation, the main steam, feedwater, hot reheat and cold reheat piping will be cut which will allow the secondary side of the twelve (12) steam generators to be removed.

2.3.3.3.2 Removal of Steam Generator Secondary Assembly

Removal of the steam generator secondary assemblies (See Figure 2.3-2) will be accomplished in the reverse of the original construction installation sequence. The steam generator secondary assemblies are expected to be free of contamination.

The Marmon clamp (See Figure 2.3-2) will be removed from the lower end of the steam generator secondary assembly. This will allow withdrawal of the hot reheat piping from the steam generators. Because of the length of the hot reheat pipe, it will be severed into several sections as it is being withdrawn from the steam generators.

The cold reheat pipe will then be severed by remote operations at the threaded connection below the primary closure dome. Severing

this connection remotely will make it unnecessary to send an individual inside the cold reheat pipe, as was done during installation. After the top of the cold reheat pipe has been cut, the lower reheat nozzle assembly will be cut free of the steam generator secondary assembly at an elevation below the feedwater ring header. This will allow the withdrawal of the cold reheat pipe from the steam generator for disposal.

After the cold reheat piping has been removed, the 40 feedwater, instrument, and steam tubes will be cut remotely below the primary closure dome. The steam generator secondary assembly will then be rigged for lowering. The secondary closure weld will be cut and the steam generator secondary assembly will be lowered out of the PCRV penetration liner. The Rucker machine, which is a large turntable designed to handle heavy loads under the PCRV, will be used to handle the steam generator secondary assemblies in the reverse order of the installation operations.

In order to detach the primary assembly from the penetration liner, the final step will be to cut the penetration liner below the flange joint at the primary closure dome, cutting from the uncontaminated side of the penetration into the contaminated PCRV lower plenum area. The cut will be made in several steps, with support shims installed to maintain vertical support for the steam generator primary assembly once it has been severed from the penetration liner. The steam generator primary assembly is also stabilized by the steam generator shroud connection to the lower floor and the helium duct connection to the CSF.

Each of the twelve steam generator primary assemblies will be detached from their respective penetrations in the above sequence and will then be removed through the top of the PCRV after the CSF is removed. This is discussed further in Section 2.3.3.11.

When cutting operations have been completed, the interior of the penetration liner may be sprayed with a strippable coating to ease future decontamination operations. A new secondary closure plate will be welded in place to seal the penetration liner in preparation for flooding the PCRV.

In parallel with the removal of the steam generator secondary assemblies, the PCRV lower plenum (See Figure 2.3-3) will be entered through the PCRV bottom head access penetration after removal of the shield plug. A radiological survey of this area will be performed to determine radiation levels and major contributors in this area. Still photographs and video recordings will also be made to assist

in mockup design and training for eventual dismantlement of the PCRV lower plenum.

2.3.3.4 Removal of Activated Components Using the ATC and FHM

Selected activated components will be removed from the PCRV using the ATC and the FHM. Use of this equipment will provide shielding while transferring highly radioactive components from the PCRV to shipping casks with minimal personnel exposure. The 37 control rod MCRBs and the 270 non-control rod hexagonal MCRBs will be removed from the PCRV by the FHM. Removal of certain components in the helium purification wells and penetrations, and placement of the refueling sleeve, will be performed by the ATC.

As identified in Section 1.5.2, the RCDs, CRDOAs, MCRBs and high temperature helium purification equipment may have been previously removed.

2.3.3.5 Detensioning and Removal of Pretensioned Tendons

Concurrent with operations discussed in Sections 2.3.3.2 through 2.3.3.4 is the detensioning of circumferential tendons in the top head and the detensioning and removal of the top crosshead and longitudinal tendons as necessary (See Figure 2.2-6). Temporary scaffolding will be erected to facilitate tendon removal. Removal will be accomplished by detensioning, in conjunction with thermal cutting.

2.3.3.6 Flooding of the PCRV

2.3.3.6.1 Preparation for Flooding the PCRV

Once operations described in Sections 2.3.3.2 through 2.3.3.4 have been completed, activities may proceed to flood the PCRV. A network of PCRV liner cooling tubes (System 46) and the tendon tubes within the PCRV concrete wall creates a potential pathway for water leakage and the spread of contamination during the cutting of the PCRV concrete. To block these potential leak paths and prevent the spread of contamination, the liner cooling tubes and selected tendon tubes will be sealed with grout or other suitable sealant.

Before flooding the vessel, all PCRV penetrations (including instrument penetration internal components and other items such as the thermocouples routed through the core support blocks) will be removed and the penetrations sealed. A PCRV low point penetration will be sealed with a specially designed closure before the PCRV is

flooded. This closure will provide piping connections for the water cleanup and clarification system described below.

2.3.3.6.2 Installation of the Water Cleanup and Clarification System

After verifying that the steam generator and helium circulator penetrations are sealed, the water cleanup and clarification system will be installed. The water cleanup/clarification system (See Figures 2.3-4 and 2.3-5) will consist of two 50 percent trains of parallel equipment. Typically the system will be operated using both trains of equipment, but it can be operated at reduced capacity (one train only) to permit routine maintenance. Figure 2.3-4 is a pictorial view diagram of the planned system.

Each train of equipment will consist of a coarse strainer designed to remove gross debris and to protect downstream equipment. A standard dimension process pump will provide the driving head for the purification flowrate through two banks of filters located downstream of the pump. A prefilter will remove larger suspended solids, and a final filter will provide the degree of filtration necessary to ensure acceptable water clarity. Suitable valving and cross connection between trains will enhance system flexibility and availability. In addition to the capability for full-flow filtration of the PCRV water inventory, the system design will also include partial (side stream) demineralization for controlling dissolved solids. "Feed and bleed" connections for adding clean makeup water and for removing contaminated water will also be provided to control tritium. (Tritium and liquid release is discussed further in Section 3.3). Chemical addition tanks are included in the design for chemistry and pH control, and to suppress biological growth. The system design will also include instrumentation, controls and sampling points. These will enable proper operation in monitoring the system and effectiveness of its components. The purified water will return to the top of the PCRV cavity by means of a distribution header designed to minimize local velocities and turbulence to maintain underwater visibility.

The equipment will be appropriate for the radioactive nature of the process fluid. Equipment that can generate a high radiation field, such as filters, will be shielded and provided with remote handling capability. Equipment fluid drains and leakoffs will be collected, treated and disposed of as discussed in Section 3.

2.3.3.6.3 Flooding the PCRV

The PCRV will be flooded well before operations that require shielding are scheduled, to allow time for the water chemistry to stabilize and turbidity to be eliminated by filtration. The PCRV will be flooded to a level that radiological conditions necessitate to provide ample shielding when the PCRV top head concrete is removed.

2.3.3.7 PCRV Top Head Concrete and Liner Removal

It is planned that the PCRV top head will be cut using diamond wire techniques, and removed in several sections which can be handled with the re-reeved Reactor Building crane. These sections will be cut so as to leave a thin horizontal layer of concrete above the PCRV liner. The remaining layer of activated concrete and liner will be removed by breaking an annular portion of the concrete with a mechanical breaker to expose the liner, then cutting the liner. This sequence is performed in this manner to prevent inadvertently breaching the PCRV liner and minimize exposure of equipment and personnel to radioactive material.

The PCRV top head sequential cutting operations consist of the following major activities (the number and shapes of these sections may change based on detailed engineering evaluation during the planning phase):

1. Seal the top head penetrations to prevent debris from entering the PCRV.
2. Set up the core drilling machines on the external wall of the PCRV to create five horizontal core drilled holes. (Figure 2.3-6).
3. Thread the diamond wire through the intersection points of the cored holes to make a loop to allow cutting of the concrete (Figure 2.3-7).
4. Insert shims (as needed) in the kerf of the diamond wire cut area to prevent closing of the gap due to the weight of the concrete.
5. Make eight inclined core drilled holes to intersect with the horizontal cut kerf (Figure 2.3-8).
6. Make the four vertical sectioning cuts using the diamond wire method (Figure 2.3-9).
7. Make the six vertical tapered back cuts using the diamond wire method.
8. Rig the sections for removal.

Removal of the eight sections of tophead concrete, of which the lower portions may be activated, will be accomplished utilizing the re-reeved Reactor Building crane. This will leave a thin layer of activated concrete covering the PCRV liner. The eight concrete sections will be moved to a waste processing area for further sectioning, segregation and preparation for disposal.

The diamond wire cutting system consists of a wire with collars containing a diamond-matrix, made to length for each individual cut, and a hydraulic pulley drive system to circulate the wire. The diamond wire is routed to envelop the cut area and then returned to a drive wheel on the drive system. The wheel rotates and pulls the wire through the cut areas. Hydraulic cylinders control the tension of the wire. Once the cut is started, the tension is increased to optimize cutting efficiency.

In order to remove the remaining concrete layer and liner plate with attached insulation, the following steps will be performed. Concrete will be removed providing a circular trough around the outer periphery of the reactor cavity (See Figure 2.3-10). Two additional parallel troughs will be formed, dividing the disk into three segments. This will provide access to the top side of the liner for thermal cutting of the liner and removal of insulation. After the insulation is removed, a final thermal cut will be made to sever the remaining insulation cover plate, thereby penetrating through to the PCRV cavity. Prior to freeing the segments, they will be adequately supported. The concrete/liner/insulation disk, after possible further segmentation, will be removed and placed in a waste processing area for further sectioning, segregation and preparation for disposal. Removal of the top head section provides an access opening to the PCRV cavity.

The final task of this activity is to set a PCRV work platform on the ledge of the top head opening above the reactor core. This platform will be a rotating platform with openings to provide access to all sections of the PCRV. It is currently planned to have multiple workstations on this platform. This platform will also be provided with underwater lights capable of being positioned to assist the workers with removal activities.

2.3.3.8 Dismantling PCRV Core Components

Following the removal of the PCRV top head and installation of the work platform, dismantling of PCRV core components will take place. These activities will include the removal of the reactor internals within the core barrel down to the CSF. Several reactor components

are highly radioactive and will require special handling. These highly radioactive components (500 mRem/hr or greater) will be specifically identified and special handling procedures developed for their removal. PCRV core components will be disassembled and removed from the top down using manually operated grappling tools or power-operated hoisting equipment operated from the work platform (See Figure 2.3-11).

The initial task is to remove the 24 upper reflector keys, which must be accomplished in order to remove the side reflector blocks. The keys will be detached by removing the five nuts per key or by thermally cutting the keys.

Removal of the approximate 5000 graphite blocks from the core (defueling elements, reflector blocks and core support blocks) will occur top-down, layer-by-layer, starting from the center and working out to the outermost boronated spacer blocks. Removing the graphite blocks from the reactor will require several handling tools. The handling tools will be comprised of remotely-engaged end effectors connected to a hoist by a cable. The cable and hoist arrangement will allow working with a shielding bell when required. A long-handled pole, capable of being remotely attached or detached, will position the end effector on the piece to be lifted. The graphite blocks will be removed from the core using the handling tools as described below.

1. Defueling elements, hexagonal reflector elements and the remaining six MCRBs: An end effector with a remotely operated grapple, similar to the Fort St. Vrain fuel-handling machine grapple mechanism, will engage the central lifting hole in the elements. The elements will be removed vertically from the PCRV.

2. Large side reflector blocks: The tool will lift the blocks by use of the two existing handling holes. The end effector will use remotely expandable collets to engage the holes.

3. Boronated side spacer reflector blocks: The tool will attach to the blocks using remotely threaded lifting points. The block will be lifted vertically and then transferred to a separate handling tool to remove the boronated pins. The boronated pins will later be removed using a shielding bell to transfer the pins for waste disposal packaging. The blocks will be moved to the waste processing area.

4. Hastelloy can reflector blocks: The end effector will be the same type as used for the defueling elements. The blocks will be lifted vertically using the same lifting rig or transferred to a separate handling tool and then removed. Several methods (e.g., suction or spearing the cans with a pick) could be used to remove the Hastelloy cans from the graphite reflector blocks. If it proves to be impractical to remove the cans, the blocks containing the Hastelloy cans will be disposed of as a higher class of radioactive waste.

5. Core support blocks: Remotely expandable collets will be used to engage the lifting holes. The end effector will accommodate the various hole spacings and sizes for the inner and outer support blocks.

6. Core support posts: The end effector will grip the outer diameters of the posts.

7. Lower post seats: The end effector will grip the inner diameter of the seat.

Since the graphite blocks have been immersed in water, appropriate steps will be taken in handling and packaging the blocks to wipe, drain, or dry the blocks as necessary to assure compliance with shipping and disposal regulations.

Estimated contact dose rates for the graphite blocks is provided in Table 2.3-1. The graphite blocks with estimated contact dose rates of 500 mRem/hr or less can be handled unshielded and prepared for radwaste shipment. Graphite blocks with boronated pins, Hastelloy cans, or other components reading over 500 mRem/hr will require shielding or remote handling. These components will be drained and transported directly to the hot service facility (HSF) or appropriate shielded area for packaging in an appropriate cask for subsequent shipment and disposal.

After removing the graphite blocks, the 24 lower reflector keys will be removed. The lower keys, which are made of Hastelloy X, will have estimated radiation levels of 10 Rem/hr at 1 meter. The lower reflector keys will be placed in a shielded container under water for movement to the radwaste area for packaging and disposal in a manner similar to that described above. The removal of the lower keys allows the core support blocks, posts, and post seats to be

removed. This will be performed underwater with grappling tools similar to those used in previous operations.

2.3.3.9 Removing the Core Barrel

The core barrel and core barrel keys will be removed by thermal cutting. The core barrel will be cut into sections suitable for handling and packaging as activated radwaste. The core barrel will be sectioned and removed to a level just above the silica blocks on the CSF.

2.3.3.10 Removal of the Core Support Floor

2.3.3.10.1 Removal of Silica Blocks, Cover Plates and Insulation from the Core Support Floor (CSF)

As currently planned, the water level will be lowered to just above the top surface of the CSF. Lowering of the water level in the PCRV will be accomplished by processing the water through the demineralizer system of the PCRV water cleanup and clarification system. The water will be analyzed prior to discharge. It is expected that the tritium level will be well below the unrestricted release limit for water discharge (0.003 microCi/cc), since all of the graphite blocks will have been removed. The water can then be released directly from the site by directing it to the cooling tower blowdown water line, which is similar to the current liquid waste discharge route.

As the water level is lowered in the PCRV, the walls will be washed down with clean water to remove residual loose contamination. A remotely-operated electro-hydraulic ram hoe will be lowered into the PCRV to break up the silica blocks. A removable seal plate will be affixed to each of the 12 steam generator penetrations in the CSF to prevent loose debris from entering the steam generator modules. After the blocks have been fragmented, a bucket attachment will be affixed to the ram hoe to remove loose debris. The ram hoe controls and operator will be on a working platform above the CSF to minimize personnel exposure. The silica block debris will be removed in unshielded containers, since radiation levels are expected to be less than 500 mRem/hr. The PCRV water level will be left slightly above the CSF to minimize the potential for airborne releases during this operation.

After the silica block debris has been removed, the insulation cover plates will be peeled up by the ram hoe with a sheet ripping attachment. The cover plates and any loose silica debris can be

picked up, vacuumed, or scooped up at this time. The steam generator penetration seal plates will then be removed. Other mechanical methods for removal of the silica blocks will be considered.

2.3.3.10.2 Removal of the Core Support Floor

The removal of the CSF from the PCRV has the following conditions that must be addressed:

1. The CSF assembly weighs approximately 270 tons, which exceeds the Reactor Building crane capability of 170 tons.

2. Radiation levels above the CSF will increase as the water level is lowered to gain access for CSF removal operations.

3. Radiation levels in the lower plenum below the CSF are expected to be 1-2 Rem/hr due to plateout on the steam generators. These radiation levels prohibit direct, manual, in-air disassembly of the CSF from underneath.

4. The CSF is configured with certain attachments that must be considered in removal operations.

5. The steam generator lifting structure and insulation on the underside of the CSF impede sectioning and scoring required for diamond wire cutting.

6. The twelve CSF support columns, cooling and instrumentation lines contained within these columns, and the steam generator primary assemblies must be separated from the CSF before a segment of the CSF can be lifted.

During the Decommissioning Planning Phase I, several methods will be considered for CSF removal. The removal methods considered will include, but not be limited to, the following:

1. For cutting and scoring of the CSF insulation plates and liner, plasma-arc, carbon-arc or other methods will be evaluated as part of the final procedure development.

2. For concrete cutting of the CSF, diamond wire and high pressure water jet cutting will be evaluated as part of the final procedure development.

The steam generator primary assemblies are planned to be disconnected from the CSF using remotely operated cutting equipment through the openings in the CSF. The CSF support columns are planned to be disconnected with similar methods or by drilling an oversize core hole through the CSF at each support column.

While still in the PCRV, the CSF may be sectioned into pieces that are within the lifting capability of the Reactor Building crane. As an alternative, the CSF could be severed from its attachments and raised above the PCRV with specially installed high capacity jacks. Once it is above the PCRV, more access is available for disassembly operations and it would be cut or segmented into pieces that could be lifted and handled. Shielding and contamination control would be provided as necessary. One or a combination of these methods may be utilized to remove the CSF. The factors of ALARA and safety will be of primary consideration in the selection of any method to be utilized.

2.3.3.11 Disassembling the PCRV Lower Plenum

During prior operations, the helium ducts connecting the CSF floor to the 12 steam generators were severed and the CSF was removed from the PCRV and the water level lowered to below the CSF. Removal of the CSF will make lower plenum components accessible, including the steam generator primary assemblies, the helium diffusers, the CSF support columns, the lower floor, the lower plenum insulation and other miscellaneous components.

The helium diffuser and shutoff valve assemblies will be removed using techniques similar to those described in the following paragraphs for removal of the steam generator primary assemblies. The helium diffuser and shutoff valve assemblies will be disconnected by remotely cutting the clamp at the connection of the diffuser to the lower floor. The assemblies will be rigged to the Reactor Building crane, removed and transferred to the waste handling area for processing and disposal. All of the remaining components in the lower plenum will be removed and transferred to the waste handling area for processing and disposal.

Using standard rigging techniques and devices in conjunction with the Reactor Building crane, the steam generator primary assemblies will be rigged to secure them before the final severance cut. Once the steam generator primary assembly has been rigged to the Reactor Building crane, it will be remotely disconnected by cutting the clamp at the connection of the steam generator shroud to the lower floor. Any remaining instrumentation or connections between the

steam generators and the lower plenum will be severed remotely. When these activities have been completed, the steam generator may be removed from the PCRV cavity by the Reactor Building crane.

Because of the anticipated high contact dose rate associated with the steam generator primary assembly (economizer, evaporator, and superheater sections), a special shielded shipping container (Figure 2.3-12) will be required. The following methodology will be employed to remove and ship the steam generator primary assembly.

As the primary assemblies are lifted from the PCRV by the Reactor Building crane, the outer shroud and tube outer surfaces will be washed down to remove as much contamination and cutting debris as possible, and will be allowed to drain as necessary over the PCRV cavity. The steam generator primary assemblies will then be moved to the truck bay. A shipping container will be located in the truck bay to accept each steam generator primary module as it is removed from the PCRV. The shipping container will consist of a metal culvert section seven foot in diameter by 27 feet long. The culvert section will be cut in half lengthwise to provide a hollow half-cylinder. Structural supports will be welded to the half section of culvert to provide structural support.

Support saddles will be mounted inside the culvert and serve a dual purpose. First, the saddles provide a means of attaching the steam generator primary assembly to the culvert and transmitting the load to the structural supports on the outside of the culvert. Second, the saddles will keep the steam generator primary assembly centered in the culvert with an annular space of about 8 inches between the inside diameter the culvert and the outside diameter of the steam generator primary assembly.

The primary assembly will be lowered through the refueling deck access hatch to the truck bay, then transferred to the packaging and shipping area. The partial shipping container with the steam generator will be moved to the packaging and shipping area, and the top half of the container will be installed. If required, the annular portion of the steam generator between the shroud and the tube bundle support column may be filled with grout which will encapsulate the tube bundle of the steam generator. In addition, grout may be pumped into the feedwater and steam tubes of the primary assembly. If necessary due to the high contamination levels, the 8 inch annular region between the outside of the steam generator shroud and the inside of the culvert will be filled with grout for shielding.

The combined weight of the shipping container, steam generator assembly, and grout will be approximately 193,000 pounds. If actual contamination levels in the steam generator primary assemblies are lower than expected, the shielding grout in the annular space between the steam generator shroud and the container may be omitted with a weight savings of about 56,000 pounds.

With the steam generators removed, all of the significant radiation sources will have been removed. This will allow the PCRV vessel to be totally drained. The work remaining in the lower plenum includes the removal of the CSF support columns, the lower floor and the insulation and insulation cover plates on the PCRV liner and penetrations. These features will be removed utilizing hands-on tools and will be processed for disposal. The Kaowool insulation removed in this activity will most likely require removal of the absorbed water to assure compliance with shipping and disposal regulations. The removal of the absorbed water will initially be accomplished by pressing or squeezing the wet Kaowool, or other suitable drying techniques as required.

During these final dismantling activities, the dose rates inside the PCRV lower plenum will be significantly lower than during previous operations since the largest radiation source, the steam generators, will have been removed. It is estimated that the general area radiation level will be low enough to allow activities to be performed in the lower plenum manually, which will increase productivity and still be ALARA acceptable.

2.3.3.12 Final Dismantling, Decontamination, and Cleanup Activities

The following activities are included in this task:

1. Scoring and cutting the PCRV sidewall insulation and liner.
2. Cutting and removing the activated concrete in the beltline region of the PCRV (See Figures 2.3-13 and 2.3-14).
3. Removal and/or decontamination of all remaining contaminated concrete.
4. Decontaminating the PCRV lower plenum liner.
5. Performing the final survey of the PCRV.
6. Demobilization and decontamination of the PCRV D/D tools and equipment.
7. Disposal of the water cleanup and clarification system.

The activated concrete will be removed in sectional units from the side walls of the PCRV, with the attached liner and both layers of thermal insulation intact as part of each unit. Diamond wire

cutting has been selected as the method to remove the activated concrete sections.

The thermal insulation, steel cover plates and steel seal sheets will be cut, and the liner plate will be scored by thermal methods before the concrete is cut with the diamond wire technique. This prevents the diamond wire from entangling in the steel seal sheets and insulation.

Tendons which must be removed for access of the diamond wire will be detensioned and removed. Other tendons detensioned to relieve compressive stress on the kerf of the diamond wire cut will be left in place.

Circumferential tendons at the elevations of the horizontal cuts will be removed to provide a path for the diamond wire. The diamond wire cuts will be made in two steps from opposite directions, making a complete cut underneath the activated belt line concrete as shown in Figure 2.3-13.

The inner row of vertical PCRV tendon tubes are suitably positioned for removing the beltline activated concrete (see Figure 2.3-14). However, in the event that these tendon tubes prove to be unsuitable for the initiation of diamond wire cuts, new vertical holes will be core drilled.

Communications down the vertical tendon tubes or new core drilled holes, through the horizontal cut, and up through the PCRV interior will allow threading of the diamond wire for the radial cuts to be made. Sections of concrete, liner and insulation that are approximately 3 feet thick, 8 feet wide, and 40 feet long will be produced and rigged to the Reactor Building crane before the final back cut is made between the adjacent tubes or holes. These sections will be moved to a radwaste processing area for further cutting and preparation for disposal.

The water cleanup and clarification system will be dismantled and decommissioned similar to balance of plan piping system. The system will be drained and the water processed as liquid waste as discussed in Section 3.3.2.2. The piping and components will be decontaminated, dismantled and packaged for disposal. The demineralizers will be the last items taken out of service. The demineralizer resins will be solidified in the liners using a mobile cement solidification system and disposed of as radioactive waste. The demineralizers will be leased equipment, and will be decontaminated and packaged as necessary for return to the owner.

Following the removal of the activated beltline concrete, a final cleanup and decontamination of the entire PCRV cavity will be performed. Decontamination methods may include conventional wiping techniques, scabbling, scarifying, vacuum sand blast, or a hydrolaser method, depending on the degree to which the contamination is fixed on the surface. A survey of the PCRV will be conducted to verify that free release criteria has been met.

As dismantlement activities proceed, guardrails, covers, barricades, caps, etc., will be placed as appropriate consistent with industrial safety considerations. Upon completion of PCRV activities, a top head closure along with other appropriate penetration caps and guardrails will be installed in compliance with good industrial safety practices.

2.3.4 Contaminated Balance of Plant System Dismantlement and Decontamination

2.3.4.1 Introduction

The decontamination and dismantlement of contaminated or potentially contaminated balance of plant systems will be done by either (1) decontamination in place, (2) removal and decontamination, or (3) removal and disposal as radioactive waste. Systems that are contaminated or potentially contaminated above releasable limits requiring decontamination or dismantlement include the following:

1. System 13 - Fuel Handling System
2. System 14 - Fuel Storage System
3. System 16 - Auxiliary Equipment
4. System 21 - Helium Circulator Auxiliary Equipment
5. System 23 - Helium Purification Auxiliary Equipment
6. System 24 - Helium Storage System
7. System 46 - Reactor Plant Cooling Water System
8. System 47 - Purification Cooling Water System
9. System 61 - Decontamination System
10. System 62 - Radioactive Liquid Waste System
11. System 63 - Radioactive Gas Waste System
12. System 72 - Reactor Building Drain System
13. System 73 - Reactor Building Ventilation System
14. System 93 - Instrumentation & Controls

Contaminated balance of plant decommissioning is scheduled to coincide with fluctuations in critical path PCRV activities to level project manpower and to minimize competition for use of plant equipment.

In general, contaminated or potentially contaminated piping, components, structures, walls and ductwork will be dealt with in the following manner. Potentially contaminated items will be surveyed to determine acceptability for unrestricted free release or to determine the cleanup required for release. Verification that plant systems or structures may be released for unrestricted use will be provided by a comprehensive radiological assessment that provides statistically significant confidence levels for all plant systems. Since the plant systems cannot be altered for these detailed radiological surveys until the systems are no longer needed to meet NRC license requirements, the detailed surveys will be conducted during the implementation phase of the decommissioning project. The results of these radiological assessments will be used to determine the workscope required for final removal of contaminated or potentially contaminated systems and components.

The piping and equipment removal experience gained at the Shippingport Station Decommissioning Project demonstrated that contaminated or potentially contaminated piping and components can be quickly removed by plasma-arc torch without compromising contamination controls when aided by portable HEPA filtered ventilation units. Because of the relatively small volume of contaminated piping at Fort St. Vrain, however, the cost and support requirements of plasma-arc torch operations (setup, torch maintenance, and HEPA-filter changeout) may dictate the use of mechanical methods, such as handsaws and hacksaws. As piping is removed, the open ends will be covered and the piping segments will be placed in LSA containers. All piping, instrumentation, valves, and fittings will be loaded into the waste containers.

Piping will be removed by following controlled steps in accordance with project procedures and radiation work permits. System tagout procedures will be followed to de-energize pumps and other electrical equipment. Piping dead legs and traps will be drained of residual water. Piping released for removal will be positively marked before being turned over for dismantling. Contamination controls and waste containers will be set up to support dismantling operations. Contamination controls will include saddle tap valves for draining residual water, drip containments to capture metal filings, HEPA vacuums, anti-contamination clothing, and respirators, as identified by the radiation work permits. Contamination control enclosures may be built where necessary to prevent spread of contamination.

Any potentially contaminated piping that is embedded in concrete will be separated from the rest of the piping system near the face of the concrete structure and internally surveyed with a detector probe inserted into the pipe. Embedded pipe that satisfies the release criteria identified in Section 4.2 will be capped, tagged, and abandoned in place. Piping that does not meet the release criteria will be internally decontaminated by scrub brush or pipe-turning tools, such as a boiler tube cleaner, and internally wiped with moist rags until it meets the release criteria. If it is embedded near the surface, the pipe may be removed from the concrete with a concrete coring tool.

2.3.4.2 System 13 - Fuel Handling System

The contaminated fuel handling equipment at Fort St. Vrain includes the FHM, four RIVs, and two refueling sleeves. However, the residual radiation and contamination levels for this equipment are low enough to allow manual disassembly on the operating floor. The operation is planned to proceed as follows:

Fuel Handling Machine (FHM) - The FHM will be disassembled into its component parts as necessary for decontamination or disposal. The four counterweight columns will be removed and lowered to the deck by the Reactor Building crane, along with the top platform. Before separating bolted components, sleeves will be attached to maintain a contamination envelope. The body of the FHM will be decontaminated on the operating floor, and if free release limits are achieved, it will be left there. If further disassembly is required for release, the lead shot will be removed, and the body will be segmented for segregation of uncontaminated material from the contaminated material. The contaminated scrap will be disposed of as described in Section 3.3.

Reactor Isolation Valves - If these valves cannot be readily decontaminated by manual means, the valves will be removed from the operating floor. The lead shot shielding, which is not expected to be activated or contaminated, will be removed through mechanically drilled holes in the shield blocks. The valves will then be disposed of as described in Section 3.3.

Refueling Sleeves - These will be decontaminated by hydrolaser techniques or sandblasting, then surveyed and released as clean scrap.

2.3.4.3 System 14 - Fuel Storage Facility

The fuel storage facility consists of nine fuel storage wells (FSWs) in concrete pits. Each of the nine inner storage wells will be decontaminated, surveyed and the top access plugs replaced. The outer wells and the reactor plant water cooling system are not contaminated and therefore, no outer well decontamination or dismantling is expected to be required for the decommissioning project. Before or after decontaminating the FSWs, some of the reactor plant water cooling system piping at the bottom of the FSW concrete pits will be removed and cut open for survey.

Decontamination of the FSWs is based on high-efficiency particulate air (HEPA) filtered vacuuming to remove loose contamination, and sandblasting or hydrolaser techniques to remove the residual contamination. A high-volume, portable HEPA-filtered vacuum unit will be connected to a special vacuum head for use in each of the cloverleaf-shaped wells. Flat surfaces will be vacuumed with a conventional vacuum head. Residual contamination will be removed by sandblasting or by use of a hydrolaser from the operating floor and from within the well. Spent sand will be collected in catchments placed at the bottom of the well. The well drain pipe will provide the necessary water drainage during hydrolaser operation. After the initial sandblasting or hydrolaser process, the five standoff plates at the bottom of the wells will be removed by a worker equipped with an impact wrench. This will provide access to the bottom plate for final decontamination and release surveys in the well and drain piping.

The well plugs will be decontaminated and replaced and sealed after the release surveys have been completed.

2.3.4.4 System 16 - Auxiliary Equipment

This equipment consists of the ATC, 3 shielding adapters, 10 equipment storage wells (ESWs), and the HSF.

ATC - All components above the top base (32 ft. 11 in. above the operating floor) will be removed by the Reactor Building crane. A containment sleeve will seal the contaminated ports in the cask and hoist assembly floor as they are separated. The hoist cover and lift extension will then be lowered to the operating floor and disassembled within a contamination control envelope. The components will be packaged and shipped for burial or to a licensed facility for processing and final disposition. The ATC will be decontaminated onsite. The internal bore of the ATC will be

decontaminated by sandblasting or by use of a hydrolaser to the free release criteria. After internal decontamination, the Reactor Building crane will be used to lay the cask body over onto the operating floor for disassembly and decontamination of the bottom flange. When all surfaces meet the free release criteria, it will be lifted by the Reactor Building crane and returned to storage on the operating floor.

Shielding Adapters - There are three shielding adapters which will be decontaminated by manual means.

ESWs - The ten ESWs are internally contaminated and will be decontaminated and abandoned in place. After the plugs have been removed, the ESWs will be HEPA-filter vacuumed similarly to the FSWs. A special vacuum head will be connected to a high-capacity, portable HEPA-filter vacuum unit and lowered into the wells to remove loose contamination. Sandblasting or use of the hydrolaser will back up the vacuum technique. Catchments at the bottom of the well will collect spent sand. Decontamination water will drain through the well drain line. After decontamination, the wells will be surveyed for release for unrestricted use. The top access plugs will be decontaminated and replaced and sealed.

HSF - The walls of the HSF will be decontaminated by sandblasting or use of a hydrolaser. Before decontamination, all equipment will be removed, packaged and shipped for burial or to a licensed facility for processing and final disposition. The HSF will be decontaminated by appropriately dressed decontamination workers. HEPA-filtered ventilation will be used to maintain a negative pressure in the hot cell during decontamination. All exposed surfaces will be HEPA vacuumed before the free release surveys are conducted.

2.3.4.5 System 21 - Helium Circulator Auxiliaries

The helium circulator auxiliary equipment is not expected to be contaminated above releasable limits based on historical survey data. However, this system will be surveyed to determine the acceptability for unrestricted release. The cleanup requirements will then be determined and performed before release.

2.3.4.6 System 23 - Helium Purification Auxiliaries

The portions of the helium purification system outside the PCRV are not expected to be contaminated above releasable limits based on historical survey data. However, this system will be surveyed to

determine the acceptability for unrestricted release. The cleanup requirements will then be determined and performed before release.

2.3.4.7 System 24 - Helium Storage System

The helium storage system is not expected to be contaminated above releasable limits based on historical survey data. However, this system will be surveyed to determine the acceptability for unrestricted release. The cleanup requirements will then be determined and performed before release.

2.3.4.8 System 46 - Reactor Plant Cooling Water System

The reactor plant cooling water system is not expected to be contaminated above releasable limits based on historical data. However, this system will be surveyed to determine the acceptability for unrestricted release. The cleanup requirements will then be determined and performed before release.

2.3.4.9 System 47 - Purification Cooling Water System

The purification cooling water system is not expected to be contaminated above releasable limits based on historical survey data. However, this system will be surveyed to determine the acceptability for unrestricted free release. The cleanup requirements will then be determined and performed before release.

2.3.4.10 System 61 - Decontamination System

The decontamination system will be surveyed to determine the extent and location of radioactive contamination. The decontamination system components are small, and will be removed and packaged in LSA shipping containers along with other contaminated components and piping. The decontamination solution tank may be removed in one piece for shipment, or segmented and packaged in LSA shipping containers.

2.3.4.11 System 62 - Radioactive Liquid Waste System

The radioactive liquid waste system will be surveyed to determine the extent and location of radioactive contamination. The contaminated radioactive liquid waste system components are small and will be packaged with contaminated piping during removal They include: the two liquid transfer pumps, the two liquid waste sump pumps, the two liquid waste filters, and the two liquid waste demineralizers. The liquid waste monitor tank and the two liquid

waste receivers may be decontaminated and abandoned in place, shipped as one piece containers or segmented and packaged in LSA shipping containers. The liquid waste sump will be considered for decontamination to free release levels and abandonment or segmentation and packaging.

2.3.4.12 System 63 - Radioactive Gas Waste System

The radioactive gas waste system will be surveyed to determine the extent and location of radioactive contamination. The large components such as the two gas waste surge tanks, the gas waste vacuum tank and the two gas waste compressors may be decontaminated and abandoned in place, shipped as one piece units or segmented for packaging and shipping. The other components are small enough to be shipped in LSA shipping containers with other contaminated piping.

2.3.4.13 System 72 - Reactor Building Drain System

The reactor building drain system is not expected to be radioactively contaminated above releasable limits based on historical survey data. However, a survey will be conducted to determine the presence of radioactive contamination. Radioactive contaminated piping or components will be either removed and shipped in LSA containers, or decontaminated to free release criteria and left in place.

2.3.4.14 System 73 - Reactor Building Ventilation

The Reactor Building ventilation system is not expected to be contaminated above releasable limits based on historical survey data. This system will be maintained during decommissioning to protect it and other plant systems against radioactive contamination and to provide ventilation for decommissioning operations. The ventilation system will be included in the site radiological assessment performed during the project planning phase.

2.3.4.15 System 93 - Instrumentation and Controls

The contaminated radiation monitors and moisture monitors will be removed during PCRV dismantling. Consequently, they will not be considered as part of the Balance of Plant workscope. Other instrument interfaces to contaminated or potentially contaminated systems will be addressed with the respective systems and all interfaces will be either removed or verified to be below free release limits.

2.3.5 Decommissioning Schedule

The individual tasks making up the decommissioning effort have been delineated using a work breakdown structure (WBS) approach. Figure 2.3-15 is a schedule of the major decommissioning tasks which includes PCRV and balance of plant system dismantling and decontamination, and site decommissioning. This schedule is used as the top-level view of the project milestones and detailed schedules. Throughout the project, dismantling the PCRV is the critical path activity, with the BOP dismantling activities scheduled to coincide with periods of reduced PCRV efforts as a means of workload leveling. During the planning phase, work will be directed toward characterizing the site, preparing the decommissioning plan, and planning and writing the procedures and specifications for the implementation phase.

The major activities and programs to be developed during the planning phase include:

1. Initial site characterization
2. Decommissioning planning
3. Work specifications and procedures
4. Quality assurance plan
5. Radiation protection program
6. Waste management plan
7. Project performance and control

The schedule depicts the planning phase occurring over an 18 month period, and the actual dismantlement and decontamination activity at the site occurring over a 39 month period.

2.3.6 Occupational Exposure Estimate

Based on the tasks outlined in Sections 2.3.3 and 2.3.4, estimates have been performed to determine the duration of each task. Estimates have also been performed to determine the average radiation levels in the areas that each of these tasks will be performed. Estimates of the radiation levels were performed based on calculated activities for each activated component and on estimated plateout activities for contaminated components. These calculated radiation levels were then reduced in accordance with standard ALARA considerations that reflect the benefits of maintaining maximum distance from the source and utilizing the shielding introduced by the water system or other local shielding.

Actual measurements of radiation levels at individual work sites will be performed prior to commencing each individual task. These measurements may necessitate changes in work procedures. The design of the water shielding system for the PCRV dismantlement and decontamination activities provides some flexibility in radiation protection, through adjustment of the water level.

The projected exposure for each major activity involving radiation exposure is given in Table 2.3-2. The total cumulative exposure for the entire decommissioning project is estimated to be 433 person-rem, due almost entirely to PCRV dismantlement and associated waste handling activities.

The 433 person-rem total exposure estimate will be used for planning purposes only and is not considered to be a restricting upper limit. Actual exposures will be controlled in accordance with ALARA principles (see Section 3.2). If projections indicate that the 433 person-rem estimate may be exceeded during the project, written notification will be provided to the Decommissioning Safety Review Committee (See Section 2.4.9) for assessment.

TABLE 2.3-1
ESTIMATED CONTACT DOSE RATES
FOR GRAPHITE BLOCKS

GRAPHITE BLOCK DESCRIPTION	NO. OF BLOCKS	ESTIMATED CONTACT DOSE RATE	TRANSPORT CASK REQUIRED
1) Defueling Blocks	1,482	<1 mRem/hr	No
2) Top Reflector Blocks	1,215	500 mRem/hr	No
3) Bottom Reflectors	589	500 mRem/hr	No
4) Radial Reflectors Hex. Removal & Permanent	480	500 mRem/hr	No
5) Large Side Reflector Blocks	312	<10 Rem/hr	Yes
6) Reflector Keys	24	<1 mRem/hr	No
7) Side Spacer Blocks			
(a) with Boron Rods	1,152	30 Rem/hr	Yes
(b) without Boron Rods	1,152	<1 mRem/hr	No
(c) Boron Rods	309,792	60 Rem/hr	Yes
8) Bottom Reflector Blocks			
(a) with Hastelloy Cans	276	300 Rem/hr	Yes
(b) without Hastelloy Cans	276	500 mRem/hr	No
(c) Hastelloy Cans	20,061	10,000 Rem/hr	Yes
9) Core Support Blocks Hastelloy Keys	24	1,000 Rem/hr	Yes
10) Core Support Blocks and Posts	244	<1 mRem/hr	No
11) MCRBs (Non-control rod)	6	300 Rem/hr	Yes

TABLE 2.3-2
PROJECTED PERSON-REM EXPOSURE FOR
THE FORT ST. VRAIN DECOMMISSIONING PROJECT

WORK ACTIVITY	ESTIMATED	
	*PERSON HOURS	PERSON HOURS
2.3 PCRV DISMANTLEMENT AND DECONTAMINATION		
Initial preparation/disassembly	11,310	7
Remove PCRV concrete top head	18,205	20
Dismantle PCRV core and core barrel	79,230	160
Remove core support floor	3,245	105
Remove steam generators and helium diffusers	1,750	25
D/D PCRV Lower plenum	4,290	29
Final PCRV dismantlement, decontamination and cleanup	12,075	20
SUB-TOTAL	**130,735**	**366**
2.4 CONTAMINATED SYSTEMS D/D (BOP)		
Initial preparation/characterization	1,920	<1
Dismantle/decon operations	28,308	1
SUB-TOTAL	**30,228**	**2**
2.6 WASTE PREPARATION, PACKAGING, SHIPPING AND DISPOSAL		
Radioactive waste less than 50 mR/hr	21,036	22
Radioactive waste greater than 50 mR/hr to 500 mR/hr	2,510	19
Radioactive waste greater than 500 mR/hr	9,509	24
SUB-TOTAL	**33,055**	**65**
TOTAL	**194,018**	**433**

* Person-hours only for those tasks where the potential for measuring radiation exposures exists

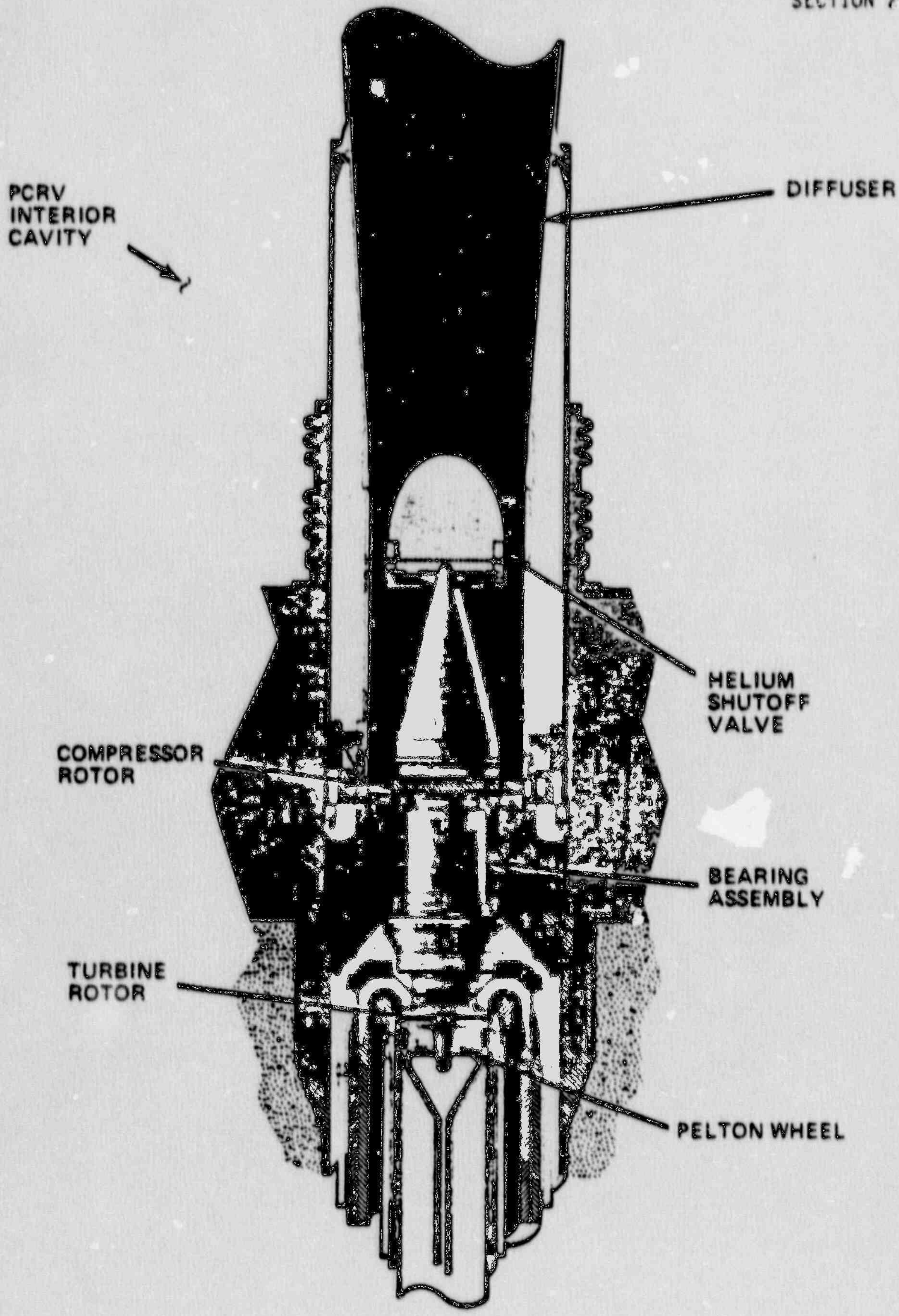


Figure 2.3-1 Helium Circulator Installation

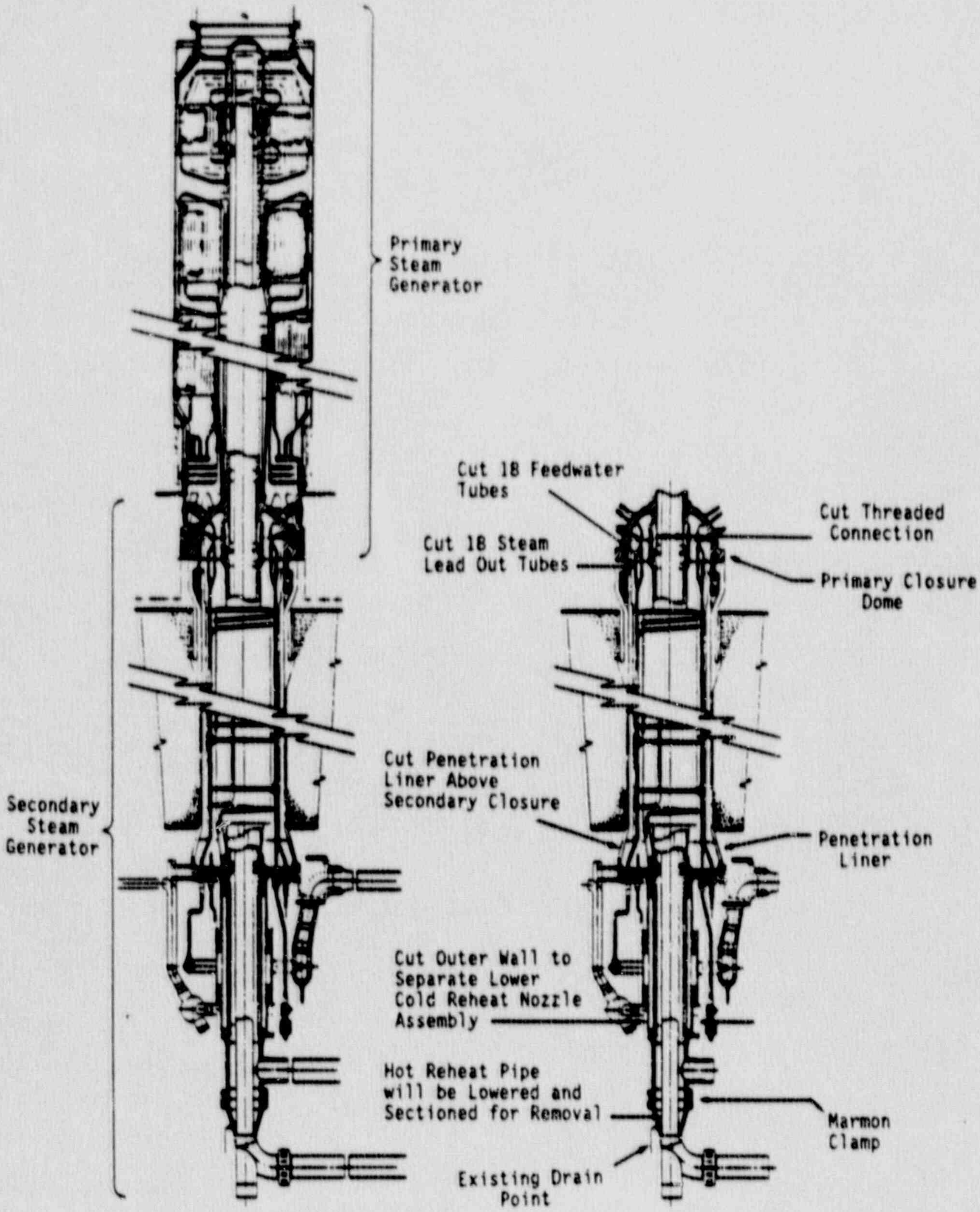


Figure 2.3-2 Steam Generator Module

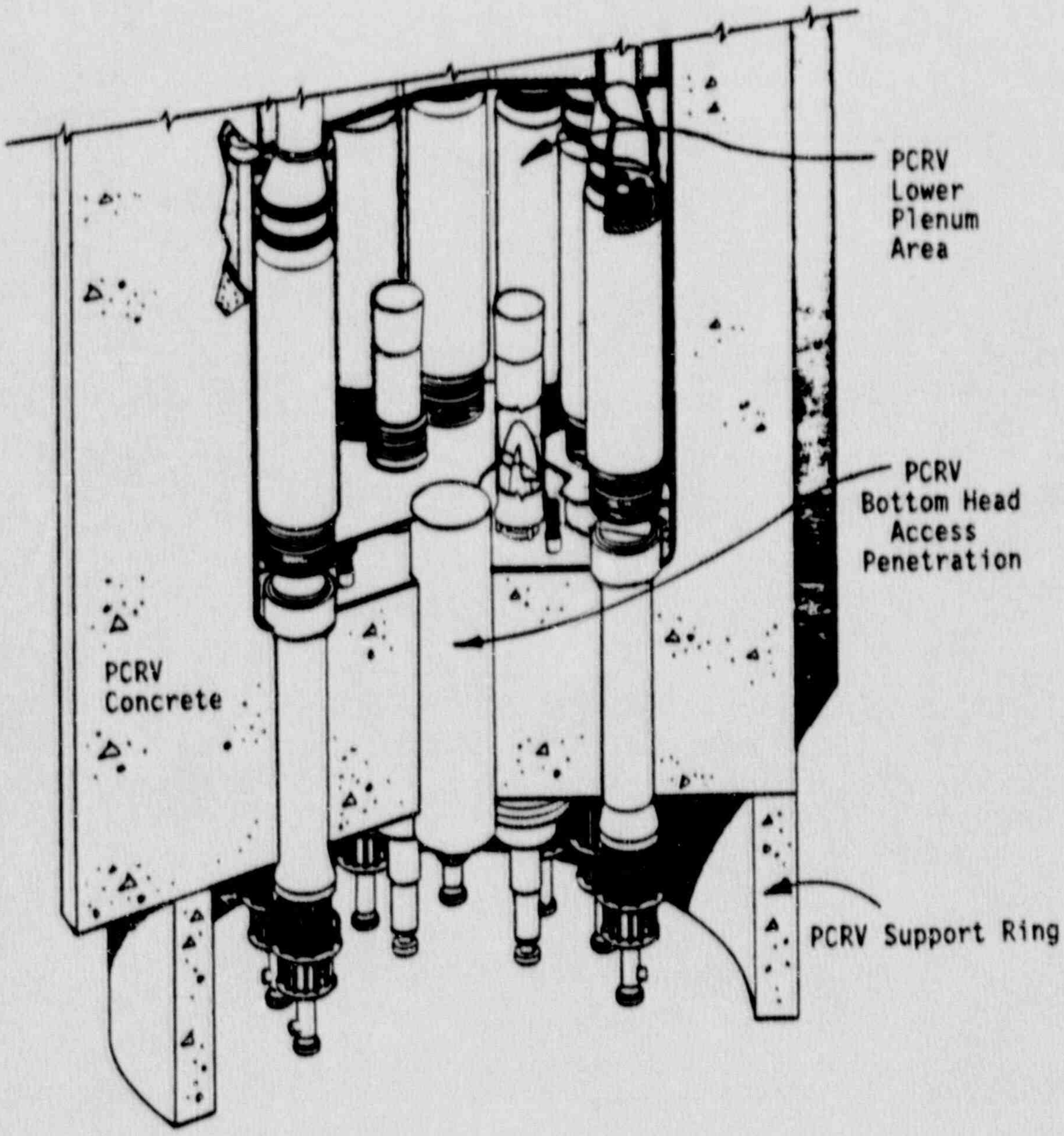


Figure 2.3-3 PCRV Lower Plenum

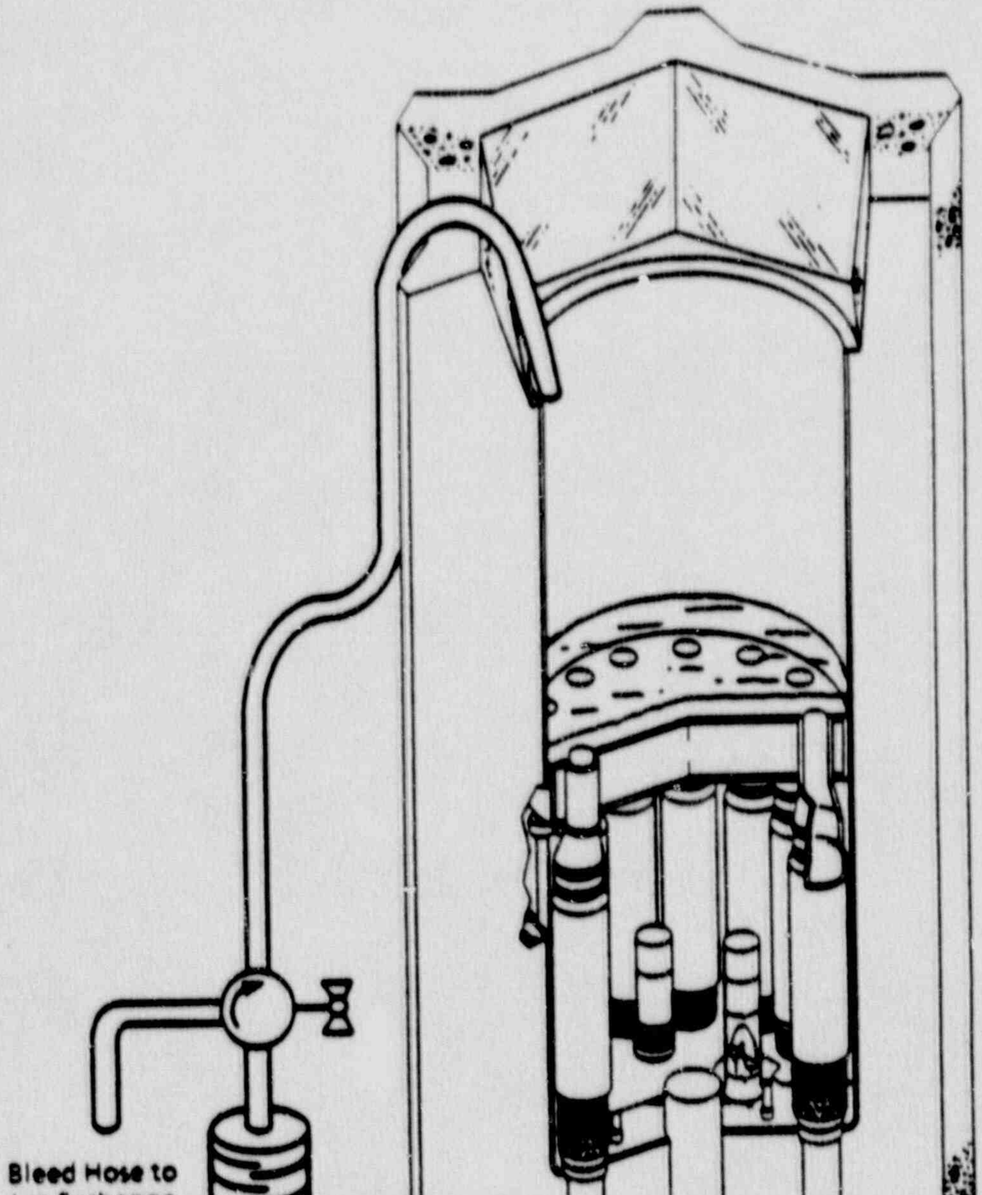


Figure 2.3-4 PCRV Water Cleaning/Clarification System

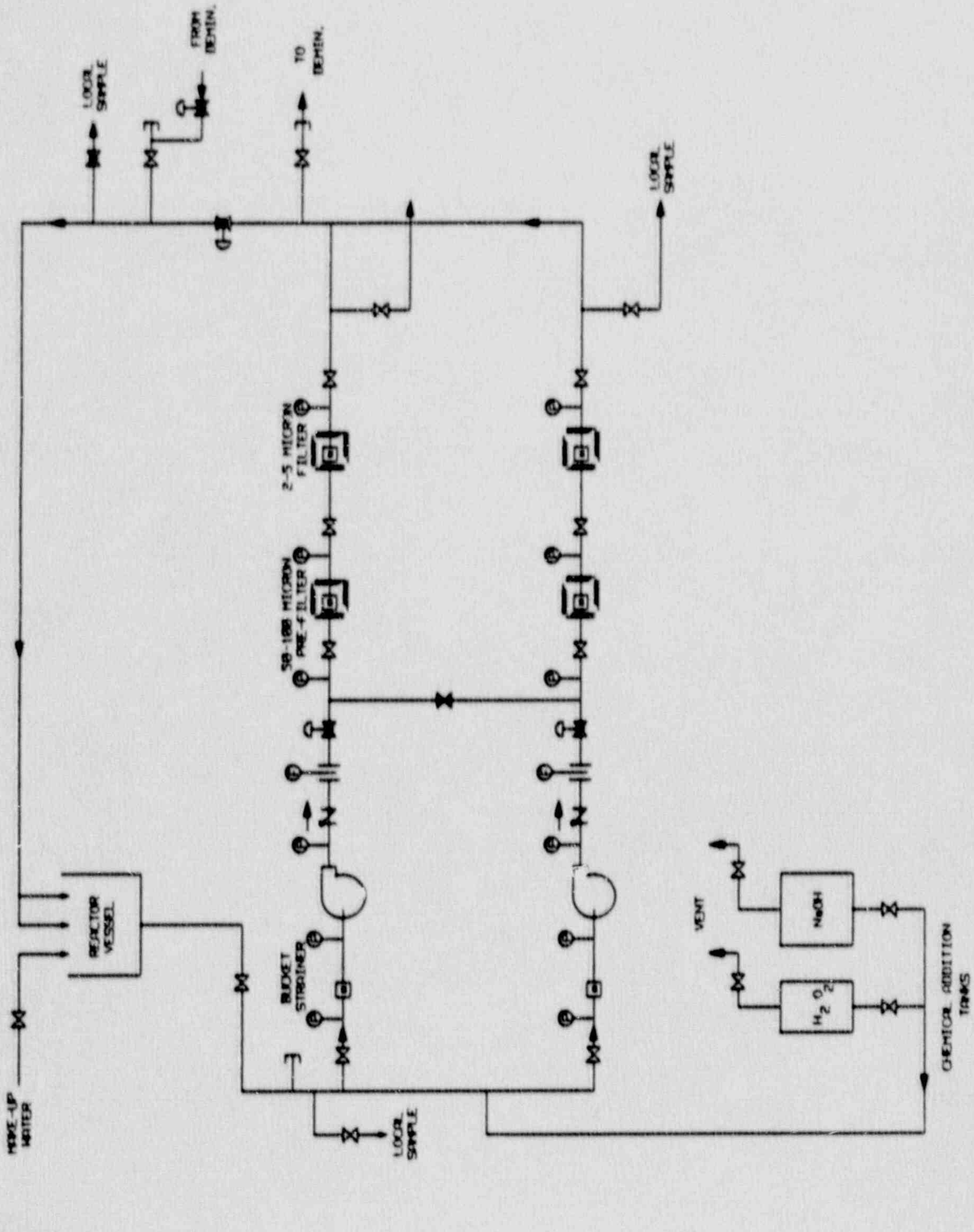


Figure 2.3-5 PCRV Water Clarification System

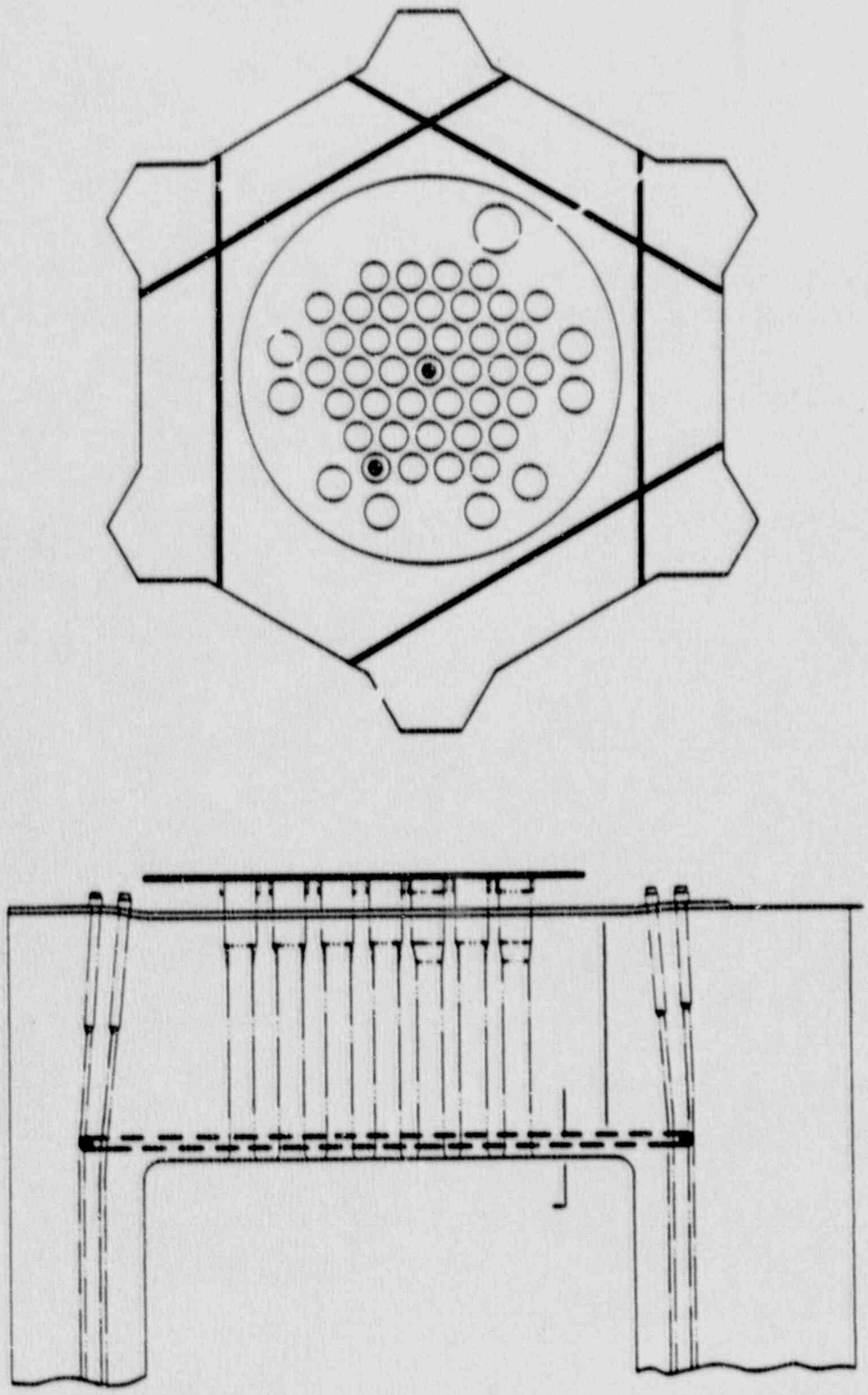


Figure 2.3-6 PCRV Top Head Cutting Arrangement

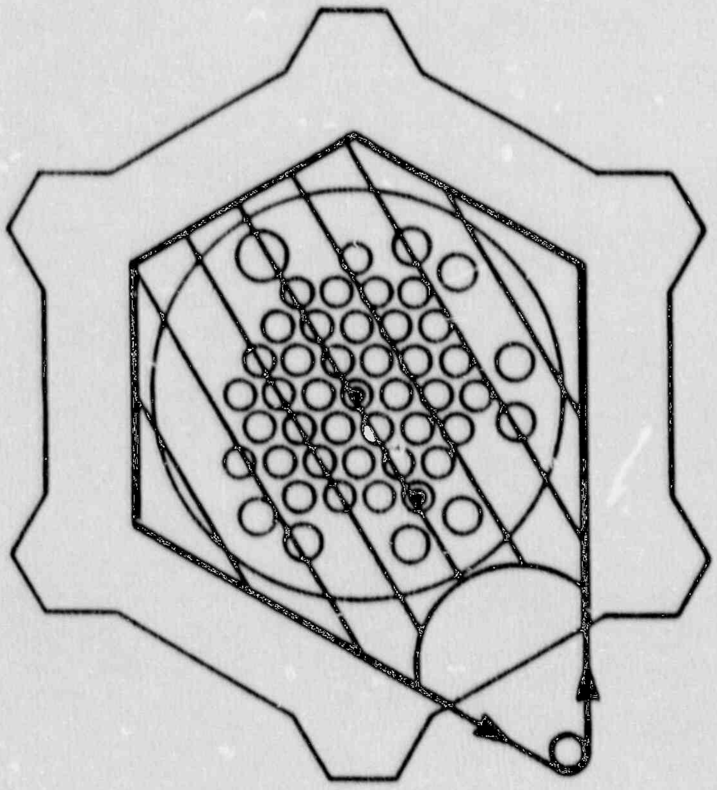
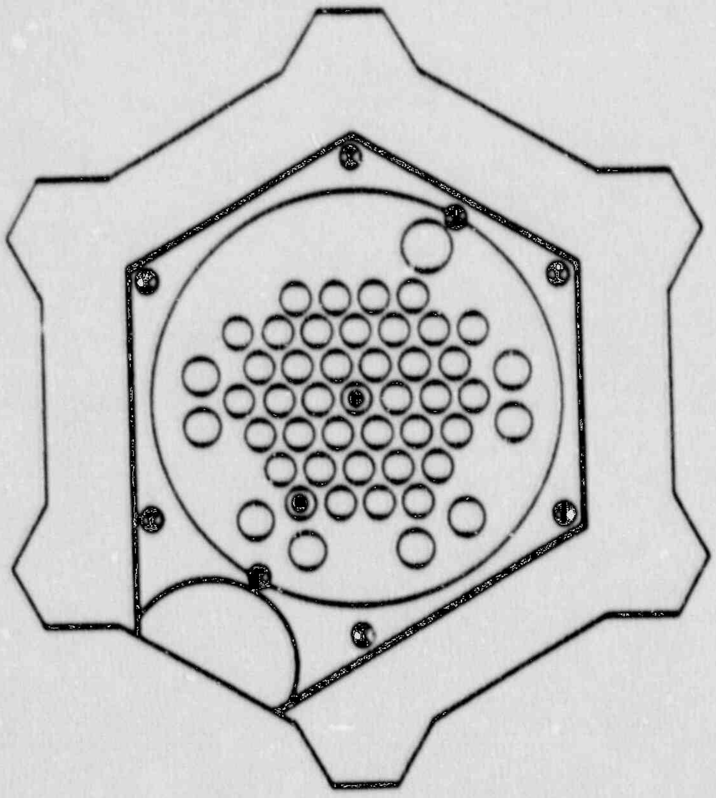


Figure 2.3-7 PCRV Cutting Configuration - Inserting the Diamond Wire



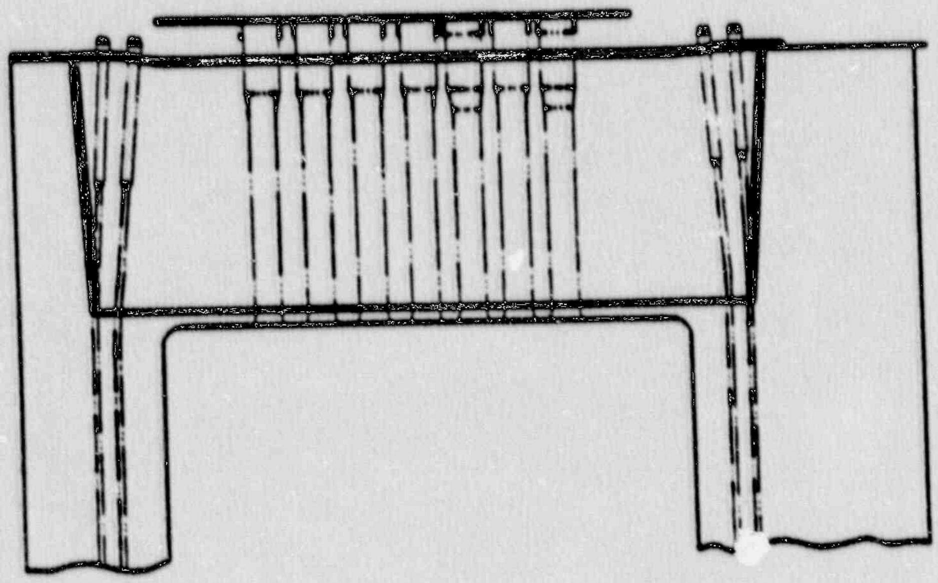


Figure 2.3-8 PCRV Cutting Configuration - Inclined Core Drilled Holes

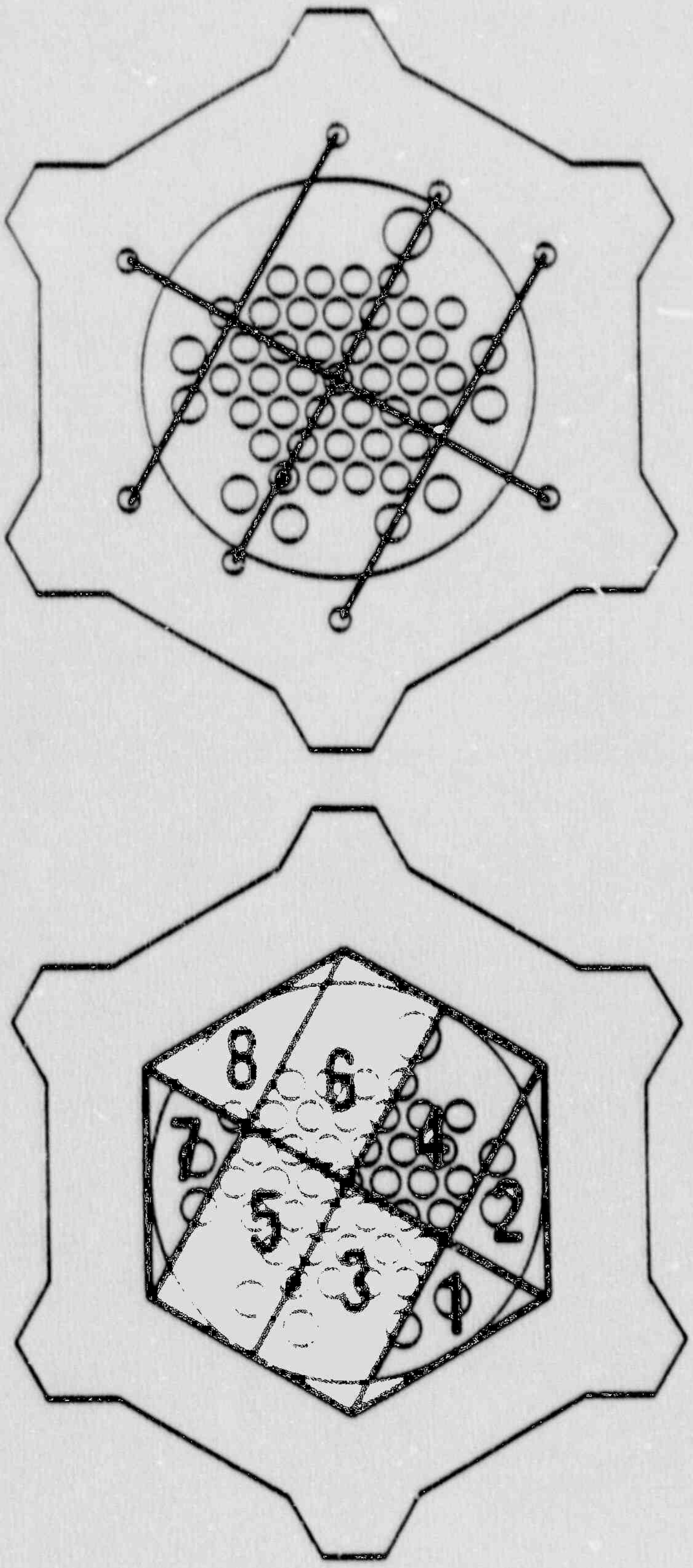


Figure 2.3-9 PCRV Cutting Configuration - Vertical Sectioning Cuts

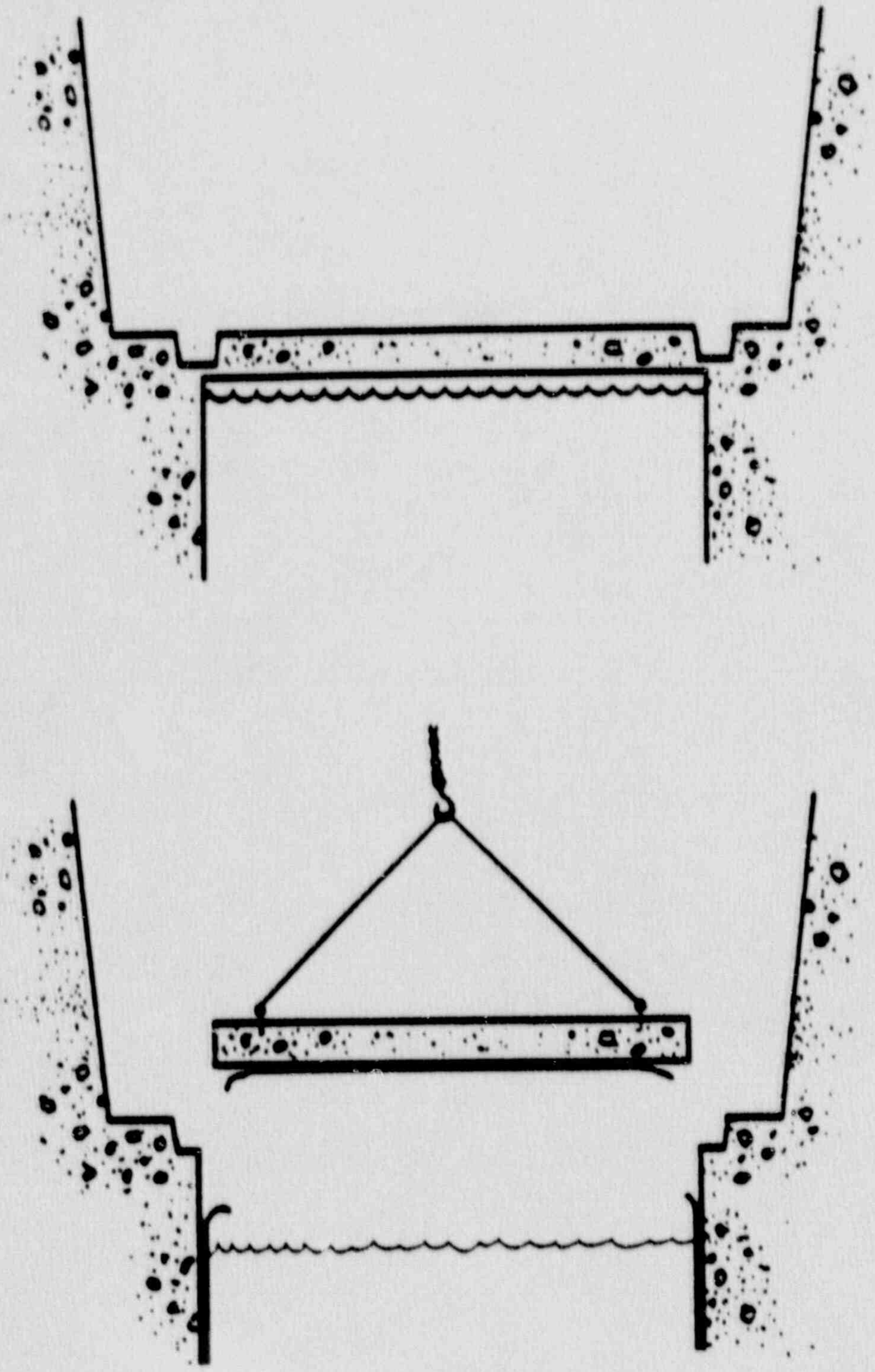


Figure 2.3-10 Removal of Remaining PCRV Top Head Concrete

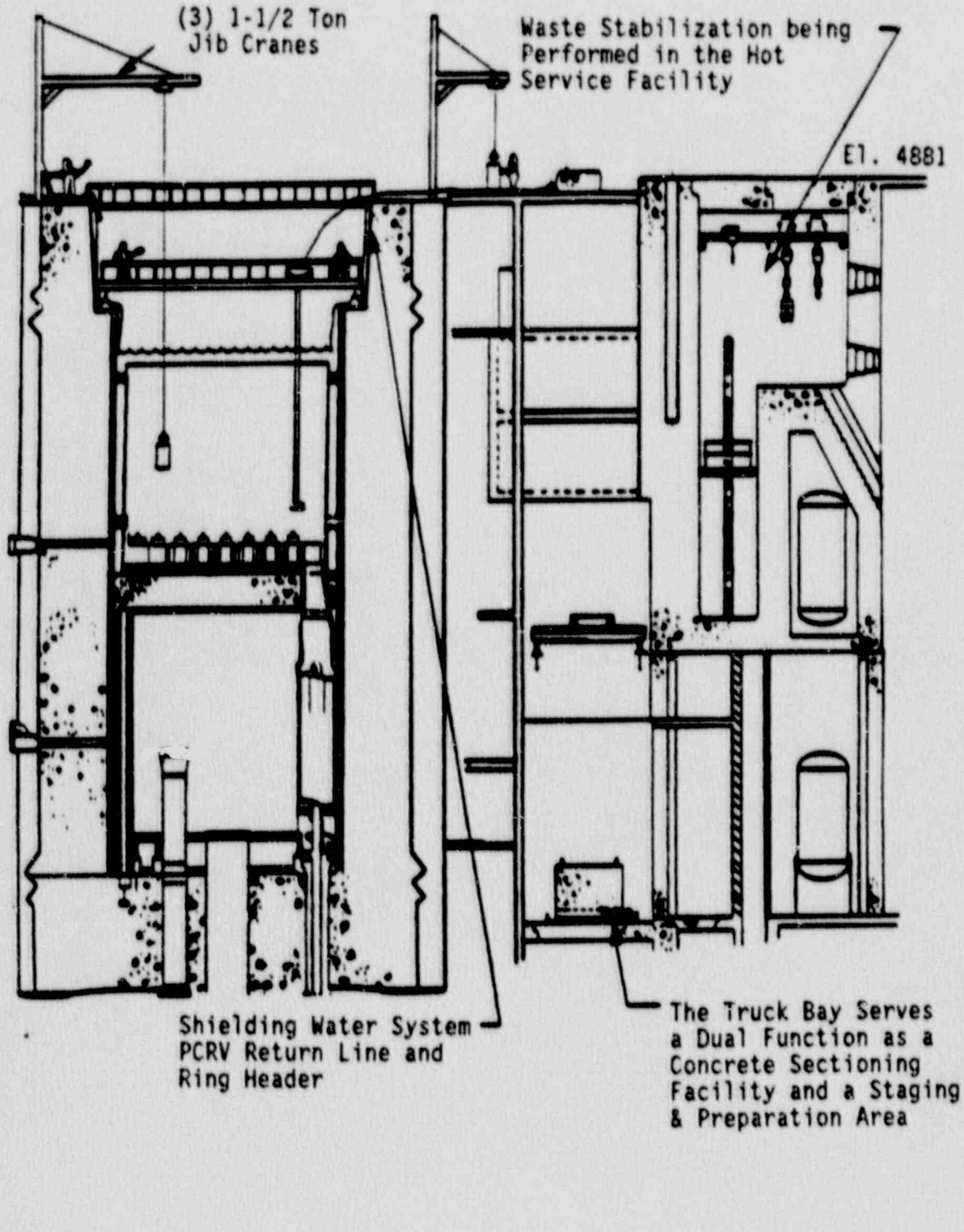


Figure 2.3-11 Elevation View of PCRV Work Area

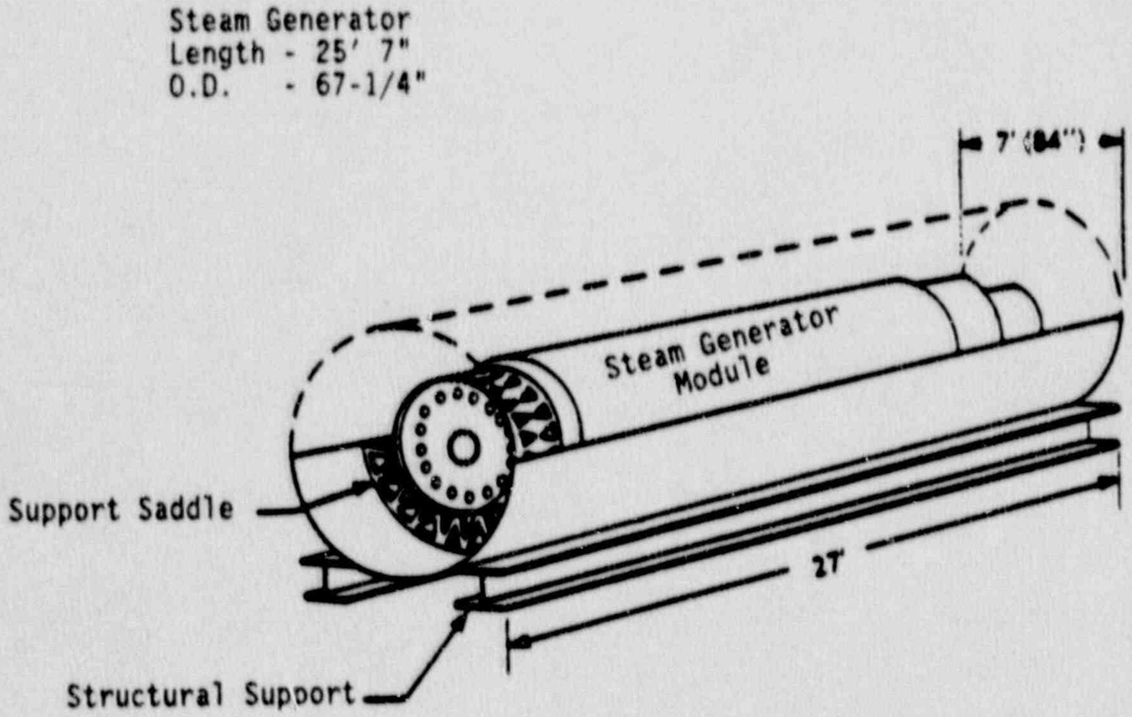


Figure 2.3-12 Steam Generator Shipping Container

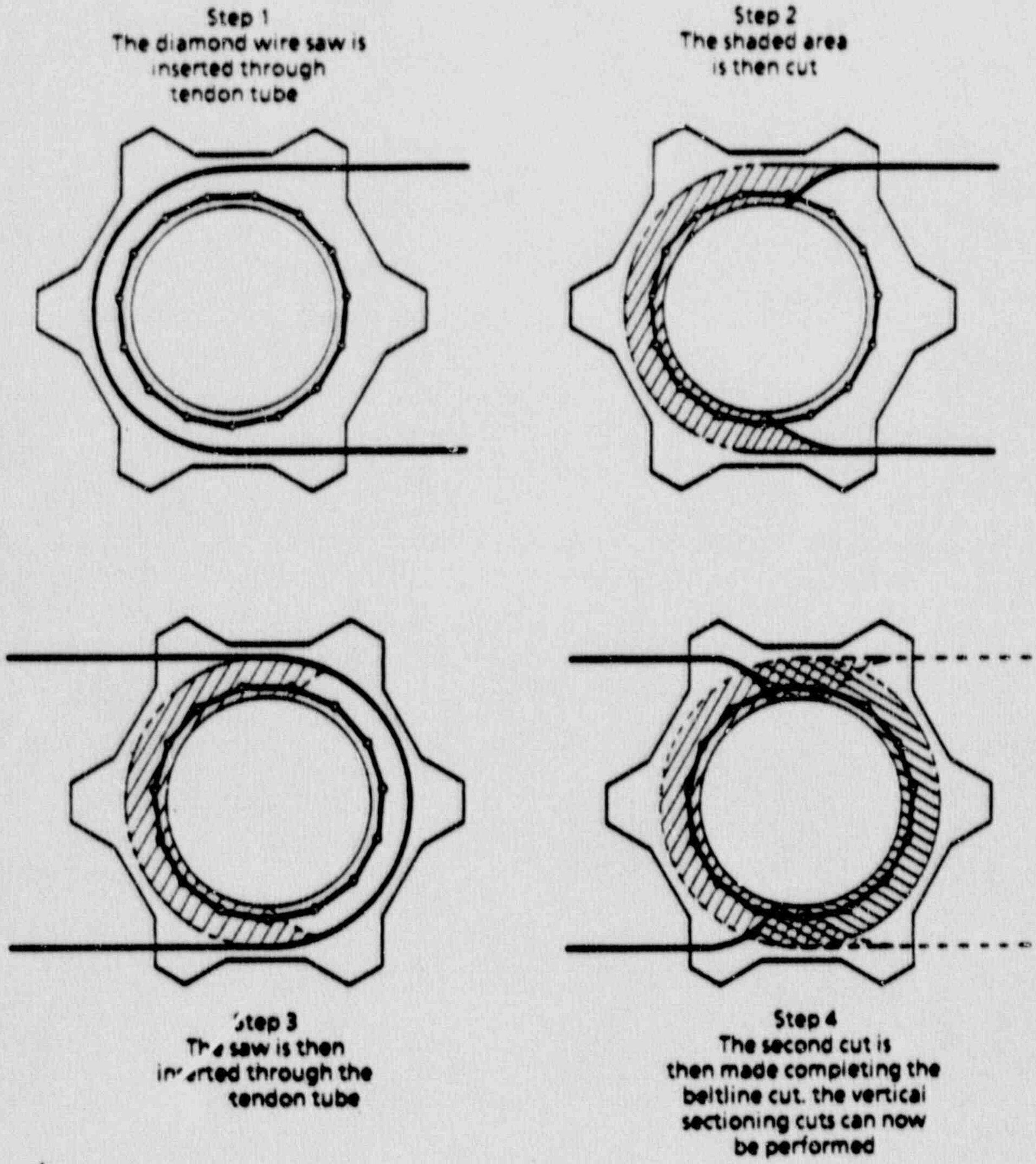


Figure 2.3-13 PCRV Beltline Concrete - Horizontal Cuts

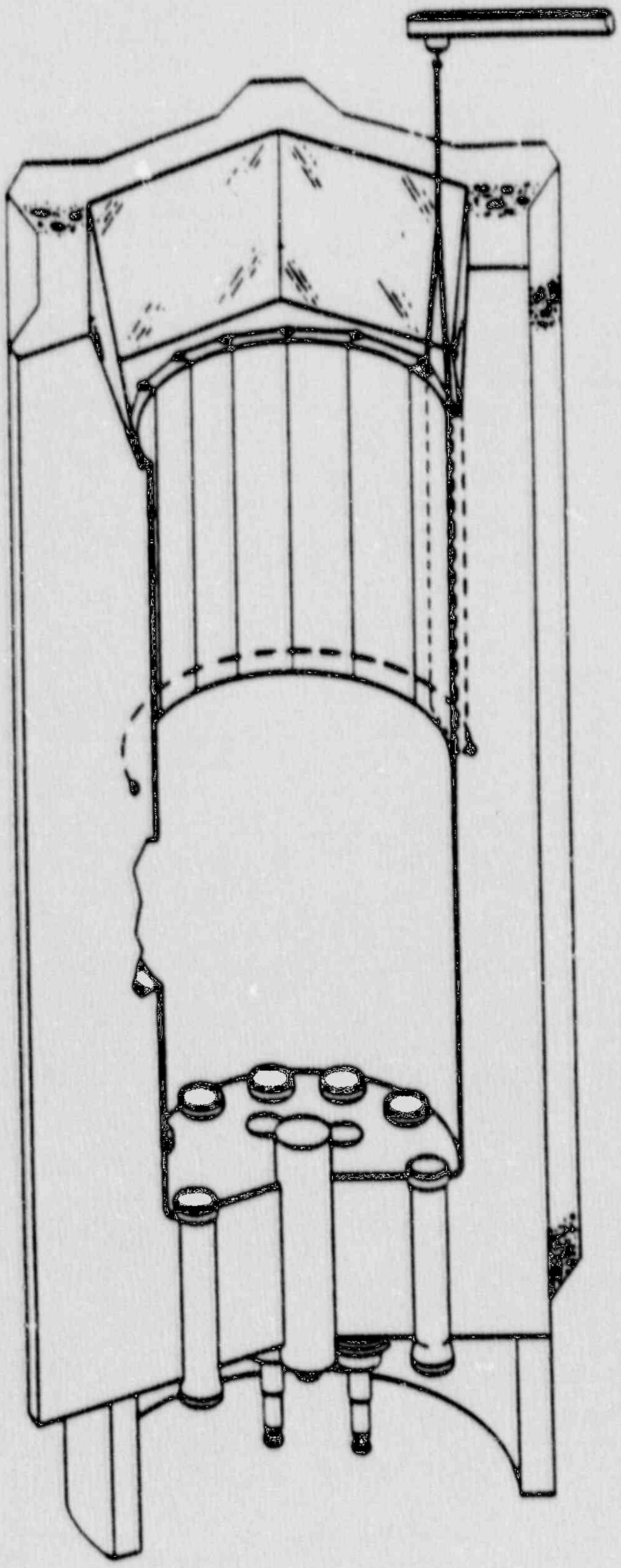
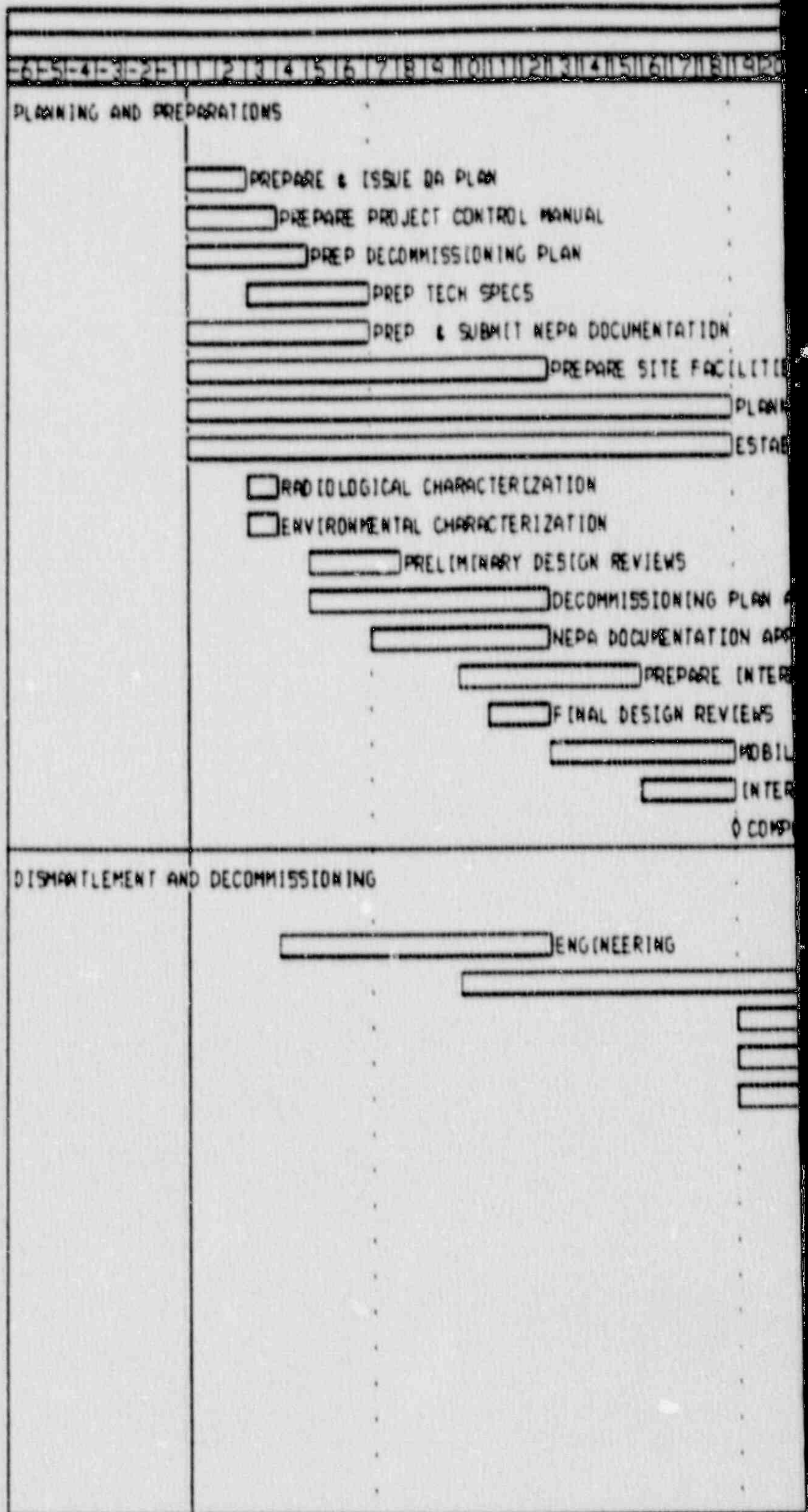
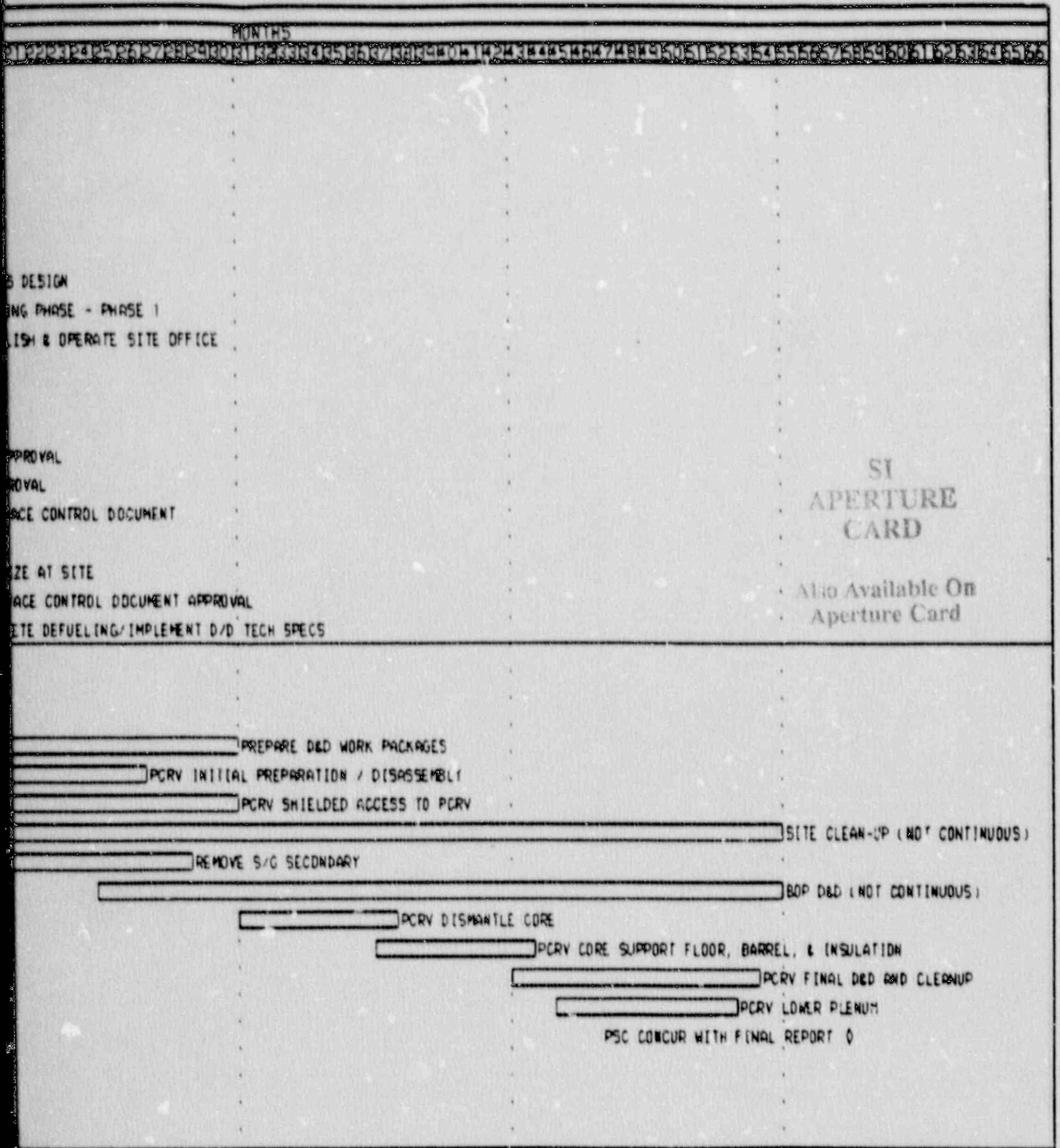


Figure 2.3-14 PCRV Beltline Concrete - Vertical Cuts



Planning Unit : Month

Primavera Systems, Inc. 1984-1990



Sheet 1 of 1

FORT ST VRAIN DECOMMISSIONING

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Figure 2.3-15 Schedule of Major Decommissioning Tasks

2.4 DECOMMISSIONING ORGANIZATION AND RESPONSIBILITIES

2.4.1 PSC Commitment

Public Service Company of Colorado (PSC) is fully committed to compliance with the existing license and applicable regulatory requirements during all phases of the Fort St. Vrain decommissioning. PSC's commitment to the safe decommissioning of the facility will be accomplished with diligence and quality service. Corporate principles, policies, and goals will be followed to ensure performance excellence, management competence, and high standards in every facet of the decommissioning project.

2.4.2 PSC Decommissioning Organization and Functions

The PSC Decommissioning staff for the Fort St. Vrain Nuclear Generating Station is shown in Figure 2.4-1. The manpower level is approximately 60 people including the key staff members and all performance level people. Overall onsite control and responsibility for all decommissioning activities for both PSC and contractor personnel rests with the PSC Program Manager for Decommissioning. Within the PSC organization, four main groups report to the Program Manager for Decommissioning. The groups consist of the Project Assurance Manager, Facility Support Manager, Operations Manager, and Engineering Manager Decommissioning. Contractor reporting requirements and lines of authority are identified in Section 2.5.

During the decommissioning process, PSC will retain responsibility for the 10 CFR 50 license and therefore will maintain the following responsibilities:

1. Overall management oversight of all decommissioning project activities.
2. Sole point of contact with all regulatory agencies within the Federal, State and local governments.
3. Overall responsibility for all licensing activities.
4. Overall management of those plans and programs required to comply with licensing requirements, including: access control, radiation protection, Decommissioning Emergency Response Plan, fire protection, Quality Assurance, maintenance and operation of existing plant systems, training and configuration management.

The key decommissioning staff members perform the functions described in the following subsections.

2.4.3 PSC Corporate Vice-President, Nuclear Operations

The Corporate Vice President, Nuclear Operations, provides the corporate support at the corporate executive level and has the authority and responsibility to ensure that all activities to carry out decommissioning are performed safely and within applicable regulations.

The Vice President Nuclear Operations shall have a minimum of fifteen years executive experience in waste management, decontamination and decommissioning, and nuclear operations. He must have a formal education in an engineering or physical science field. Knowledge in the areas of regulation and compliance, decommissioning techniques, and applied radiation protection programs are required. In addition, a background of knowledge with respect to NRC and DOE is desirable.

2.4.4 Program Manager for Decommissioning

The Program Manager for Decommissioning is directly responsible to the Vice President, Nuclear Operations. The Program Manager for Decommissioning coordinates and oversees all decommissioning activities. This position provides direction to the support groups to ensure radiological and industrial safety, compliance with regulatory requirements, cost-effectiveness, and interfaces for PSC Labor Relations of the decommissioning project. The Westinghouse Team Project Director will report to this position.

The Program Manager for Decommissioning shall have a minimum of ten years responsible plant experience with formal education in an Engineering or Physical Science field. A significant technical background to have good working knowledge of plant principles of operation, maintenance and engineering principles. Additional knowledge in the areas of regulation and compliance, decommissioning techniques and applied radiation protection programs are required.

2.4.5 Project Assurance Manager

The Project Assurance Manager is responsible for Quality Assurance oversight, auditing functions, licensing and regulatory compliance, and overall industrial safety. This position reports to the Vice President, Nuclear Operations, on quality assurance matters.

The Project Assurance Manager shall have a minimum of five to eight years experience in a responsible position that includes

coordination, direction and supervision of personnel, a formal education in an Engineering or Physical Science field, and a working knowledge and understanding of plant design and operation and construction practices is required. A balance of experience in quality assurance related activities and in regulatory/compliance requirements are preferred.

2.4.6 Facility Support Manager

The Facility Support Manager is responsible for Radiation Protection the ALARA, the Access Control and Training programs. This position is also responsible for managing support areas of records control and retention, PSC training, PSC materials and facilities.

The Facility Support Manager shall have a minimum of five to eight years experience in a responsible position that includes coordination, direction and supervision of personnel. A formal education in Engineering or the Physical Sciences or the equivalent experience in a science or engineering subject is preferred. [illegible]al training in radiation protection is required.

2.4.7 Operations Manager

The Operations Manager is responsible for the overall conduct and management of operations and maintenance functions. These responsibilities include system operations, testing and surveillances, system maintenance, lay-up and turnover.

The Operations Manager shall have a minimum of eight years of responsible power plant experience of which five must be nuclear power plant experience, including coordination, direction and supervision of personnel. A thorough working knowledge and understanding of plant design and operation and maintenance functions (including instrumentation and control maintenance activities) are required.

2.4.8 Engineering Manager, Decommissioning

The Engineering Manager, Decommissioning, is responsible the administrative and technical functions of the decommissioning project. Responsible areas include management of contract work, technical assistance, evaluation and administration of contract changes, project scheduling and overall general contracts. This position is also responsible for the general oversight of field

work, preparation of engineering evaluations and coordination with operations.

The Engineering Manager, Decommissioning, shall have a minimum of a Bachelor's Degree in Engineering or the Physical Sciences and have a minimum of three to five years of professional level experience in nuclear services, nuclear plant design and operation, including coordination, direction and supervision of personnel. A working knowledge and understanding of decommissioning techniques, scheduling and contract administration is required.

2.4.9 <u>Decommissioning Safety Review Committee</u>

The DSRC is composed of the Program Manager for Decommissioning (Chairman), Facility Support Manager, Engineering Manager Decommissioning, Operations Manager, Project Assurance Manager and the Westinghouse Team Project. This committee reports to the Vice President of Nuclear Operations. The function of this committee is to monitor decommissioning operations to ensure that they are being performed safely. This committee will review and audit major decommissioning operations dealing with radioactive material and radiological controls. In addition, they will review work packages and procedures involving expected high radiation levels, reports, reportable occurrences under 10 CFR 20 and 10 CFR 50, and changes made in accordance with 10 CFR 50.59.

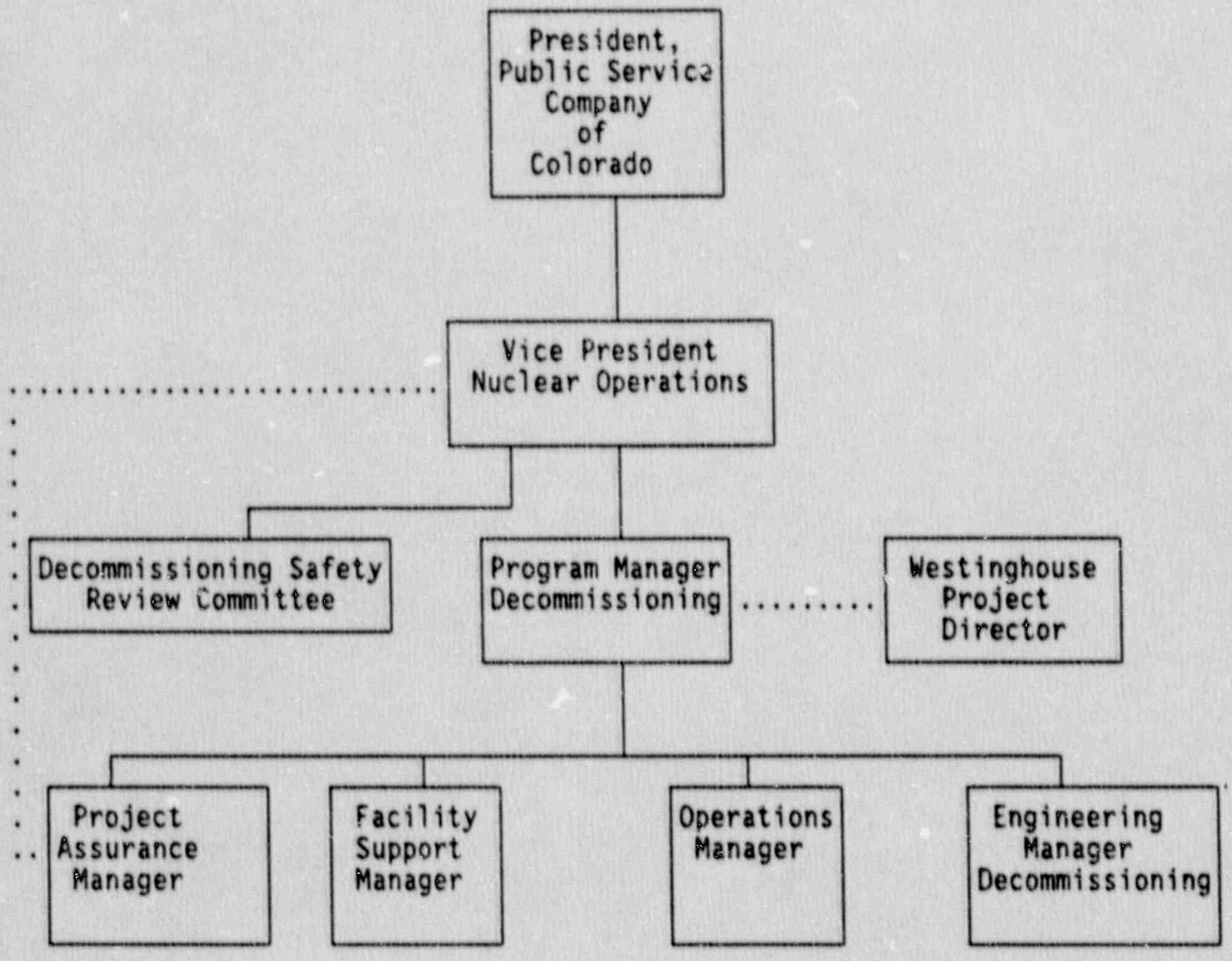

Figure 2.4-1
PSC Decommissioning Organization

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2.5 CONTRACTOR RESPONSIBILITIES

2.5.1 Westinghouse Team Organization and Functions

This section describes the responsibilities, work scope, and qualifications of the Westinghouse team that will perform the decommissioning. Since PSC retains overall licensing responsibility, the PSC and Westinghouse team interface will be structured to clearly demonstrate PSC compliance and control as required. Westinghouse will, as a minimum, obtain approval of top level project procedures, plans and programs that could have an impact on license compliance or safety.

2.5.2 Westinghouse Team Scope of Work

Based on a competitive bid selection process, PSC selected the Westinghouse team to perform the decommissioning, dismantlement and decontamination of Fort St. Vrain. This team is an affiliation of Westinghouse and MK-Ferguson Corporations. Westinghouse is the overall lead organization for the program.

Within the Westinghouse team, Westinghouse will be responsible for overall project management. In addition, Westinghouse will also be responsible for decommissioning engineering, licensing support, and will provide the project quality plan throughout the project. The overall responsibilities of each of the Westinghouse team members are summarized in Figure 2.5-1. The Westinghouse Quality Assurance organization, responsibilities and reporting lines of communication are described in Section 7 of this plan and depicted in Figure 2.5-2. MK-Ferguson will provide the site labor, labor management and supporting infrastructure for decommissioning.

The Fort St. Vrain decommissioning project will be conducted in two major phases. A detailed breakdown of the Westinghouse team scope of work is contained in Appendix I of this plan.

2.5.3 Organization of the Westinghouse Team

This section identifies the Westinghouse team organization and their responsibilities in the Fort St. Vrain decommissioning project. The Westinghouse team combines many years of successful experience in the design, construction, operation, and decommissioning of commercial and government-owned nuclear facilities. Westinghouse and MK-Ferguson have a strong commitment to the project and to operating in a safe, environmentally sound, cost-effective and responsible manner.

The Westinghouse team Organization Chart, Figure 2.5-2, shows the interrelationship of the positions within the Westinghouse team project organization. Descriptions of the responsibilities and qualifications are provided in the following paragraphs.

2.5.3.1 Fort St. Vrain Westinghouse Project Director

The Project Director is the most senior and responsible management position in the Westinghouse team project organization. The Westinghouse team Project Director will provide a single point of contact for PSC on the decommissioning effort. The Project Director reports to the PSC Program Manager for Decommissioning and is fully responsible for Westinghouse team personnel, plant safety, prevention of environmental occurrences, quality assurance, project integrity, costs, schedule, efficiency, and technical output of the overall program.

The Project Director will be responsible for project implementation for both project phases and will have full authority to administer Westinghouse team resources. The Project Director reports directly to the Vice President of the Westinghouse Energy Systems Business Unit.

Other duties and responsibilities include the following:

1. Establish project manning requirements, organizational structure, scope, and necessary levels of expertise.
2. Select and manage the project staff.
3. Ensure that the project schedule and budget are properly detailed and defined.
4. Direct the set up of all project control programs, operating plans, and technical services.
5. Ensure that the project meets applicable regulatory standards.
6. Direct all phases of site work, including preplanning, mobilization, training, temporary facility erection, decontamination and dismantling activities, conversion, and project closeout.
7. Ensure that all work activities are carried out according to the project standards of safety, quality, and reliability.
8. Direct team members, technical services, and operations and control activities for entire project.
9. Enforce adherence to the project policies and procedures.

2.5.3.2 Technical Services Manager

The Technical Services Manager is responsible for engineering, Westinghouse team quality assurance, licensing support, and radiological and environmental control activities. The Technical Services Manager reports directly to the Westinghouse Project Director. A requirement for a Technical Services Manager is based on the need for quality engineering and technical support services to ensure successful on-site operation. The Westinghouse team Quality Assurance Manager reports to the Vice President and General Manager, Energy Systems Business Unit, on quality assurance matters and to the Technical Services Manager for administrative direction and implementation of the Quality Assurance Plan.

The Technical Services Manager is responsible for the technical services organization, which will perform a wide variety of work in support of the overall facility decommissioning. Initial efforts include completion of the decommissioning plan, tooling design, and procedure and process definition. Following completion of this preliminary work, emphasis will shift to providing technical support in design of tools, development of procedures operation, waste processing and waste management, radiochemistry and health physics for the D/D effort and waste disposal activities.

Duties of the Technical Services Manager will consist of managing department manpower and funding allocations. The Technical Services Manager also ensures that technical aspects of the project are done in a safe, disciplined, and quality manner.

Other duties and responsibilities of the Technical Services Manager include the following:

1. Perform the engineering necessary to support work package development, including tooling design, prepare material lists.
2. Ensure proper review/approval of engineering documents, purchase orders, field design changes, and other documents, as required.
3. Maintain engineering team to provide design engineering support.
4. Provide input to establish an engineering schedule/budget and continuously monitor cost/accomplishments against established budget and schedule.
5. Advise the project manager of changes in plans or changed conditions affecting costs or schedules.

2.5.3.3 Operations Manager

The Operations Manager is responsible for the performance of all dismantling, decontamination, and conversion activities in a safe, disciplined, and quality manner. The Operations Manager reports directly to the Westinghouse Project Director.

The Operations Manager is responsible for the safe, disciplined management of the decontamination and dismantling activities, waste processing, and facilities management by implementing the radiation protection program, and quality assurance plan throughout his department. The Operations Manager will also ensure that adequate short-term internal planning is accomplished and that this planning is in agreement with the project master schedule, as well as PSC goals and objectives. The Operations Manager is also charged with accurately identifying the personnel and physical resources required to complete all production tasks, and for identifying and integrating the operations department scope of work, budget, and schedule.

Other duties and responsibilities of the Operations Manager include the following:

1. Manage the day-to-day activities of the project team at the site as well as the subcontractors.
2. Prepare work packages and specs for the modification or removal of plant structures.
3. Prepare and manage work packages for decontamination, dismantling, and asbestos removal and disposal.
4. Estimate field activity costs and record them.
5. Prepare procedures and specs for modifications, deenergizing, or removal of electrical power, lighting and switchgear, and systems operation.
6. Prepare and manage work packages for the modification and removal of piping, components and systems, including HVAC.
7. Supervise project procurement.
8. Manage project site industrial safety program and medical facilities.
9. Ensure that training is provided to the work force.
10. Provide work package document control.
11. Acquire and manage craft labor for decommissioning, decontamination, waste handling, and site maintenance.
12. Manage and interface routine project activities with PSC, including as a minimum clearance and system turnover.

2.5.3.4 Project Control Manager

The Project Control Manager is responsible for all scheduling, project control and reporting systems, and the integration of reports at the project level. The Project Control Manager reports directly to the Westinghouse Project Director.

The Project Control Manager ensures that all relevant information regarding cost/schedule integration and control is available in the proper format (either summary or detailed data). The Project Control Manager will also address any schedule variances, including outlining the problem, providing potential solutions, assessing input and reporting analysis results. This will be accomplished by the set up of an appropriate level budget/schedule control system broken down into definable work packages. Necessary subsystems, such as collection, reporting, and analysis, will combine to form a total system that will provide a significant management tool.

Other duties and responsibilities of the Project Control Manager include the following:

1. Prepare and evaluate productivity data.
2. Supervise overall cost and scheduling functions.
3. Prepare management reports.
4. Prepare and coordinate detailed activity schedules.
5. Forecast cost and analyzes trends.
6. Evaluate schedule impacts and formulate alternate plans as necessary.
7. Ensure time and labor studies are done to determine costs on specific operations.
8. Maintain interface with the PSC administrative and scheduling functional groups.
9. Establish and maintain a records retention system.
10. Establish and maintain a management information system.
11. Establish and perform audit activities, as required (financial, schedules, progress).
12. Prepare and verify project invoices.

2.5.3.5 Corporate Commitment

Executive corporate management of each Westinghouse team member will continue to monitor Fort St. Vrain decommissioning project progress through direct lines of communication and reporting (See Figure 2.5-2). The Westinghouse Project Director will report to the Vice President and General Manager, Energy Systems Business Unit.

The Fort St. Vrain decommissioning project has been assigned a high priority within MK-Ferguson. The Operations Manager is responsible for MK-Ferguson's project scope, and reports to the Executive Vice President, MK-Ferguson.

2.5.4 Westinghouse Team Qualifications and Experience

The Westinghouse team has extensive and comprehensive experience performing all the activities necessary to successfully decommission Fort St. Vrain. Expertise in each of the disciplines essential to successful completion of the Fort St. Vrain project is evidenced in the matrix of projects and experience provided in Table 2.5-1. Westinghouse and MK-Ferguson have shared joint work experience on the following projects:

1. Shippingport Decommissioning Project
2. WEPCO (Point Beach) Steam Generator Replacement Project
3. WPPSS Design and Construction Projects
4. AEP (D. C. Cook) Steam Generator Repair Project
5. A1W/A4W Nuclear Reactor Prototype
6. Shippingport Plant Modification
7. Savannah River

This shared experience will promote a cohesive approach, productivity, close integration under Westinghouse project management, and consistency in the Fort St. Vrain project.

2.5.4.1 Site Release Experience

The Westinghouse team has successfully achieved the unrestricted release of the facilities listed in Table 2.5-2.

MK-Ferguson currently is the DOE contractor for the Uranium Mill Tailings Remedial Actions Project (UMTRAP). This effort, which began in 1983, encompasses 22 sites and approximately 700 vicinity properties in ten states. The scope of this project includes verifying the effectiveness of remedial actions. These remedial actions are documented in the vicinity property completion reports.

Westinghouse personnel were contributors to the document "Final Consolidated Implementation Plan for Site Release, Rev. 1". This plan was used to direct site release activities at the Shippingport Decommissioning Project. Westinghouse personnel have actively participated in final site characterization and final report preparation activities.

2.5.4.2 Radiological Protection Experience

The Westinghouse team has extensive experience in designing and implementing effective radiation protection programs for projects like Fort St. Vrain. The team has developed or played a major role in developing radiation protection and ALARA programs for routine and outage activities. Examples of facilities where plans have been successfully implemented include:

- Limerick Generating Station
- Peach Bottom Atomic Power Station
- Nine Mile Point Unit 1
- Waterford 3 Steam Electric Station
- Salem Generating Station
- Rancho Seco Nuclear Plant
- Pilgrim Nuclear Power Station
- E.I. Hatch Nuclear Plant
- Shoreham Nuclear Power Station

Westinghouse and MK-Ferguson are experienced in developing ALARA programs and evaluating methods of reducing occupational radiation exposure (ORE).

1. Westinghouse ALARA Programs:

   - Developed dose models for tracking exposure by task, identifying areas where improvement is needed, and developing cost effective solutions.

   - Sponsors the Radiation Exposure Management seminar, an international symposium for communicating and discussing ORE topics among plant health physicists and ALARA engineers from plants designed by Westinghouse and others.

   - Participates in Electric Power Research Institute (EPRI) cooperative programs, aimed at identifying and reducing radiation sources in nuclear plants.

   - Performed radiological assessments for various plant sites and licenses, including National Nuclear Corporation, Mitsubishi Heavy Industries and NIRA/SOPREN.

   - Provided onsite ALARA consultation and coordination during San Onofre and Millstone steam generator sleeving, Connecticut Yankee refueling, Krsko (Yugoslavia) steam

generator maintenance, and Point Beach steam generator replacement.

2. MK-Ferguson ALARA Programs:

- ALARA program results achieved at three operating nuclear plants (Point Beach, D.C. Cook, and Vermont Yankee) and the Shippingport decommissioning project. In the D.C. Cook project, over 70 percent of the initial 1900 person-rem estimate was saved. At Shippingport, the estimated 1000 person-rem was reduced to an actual expenditure of 160 man-rem.

- Construction management services for the construction, modification, decontamination and decommissioning of various sites, including Savannah River, Knolls Atomic Power Laboratory, INEL, UMTRAP, and the Weldon Spring remedial action project.

- Construction ALARA/health physics, chemical decontamination program management and radioactive waste management services for the recirculation system piping replacement project at the Vermont Yankee Nuclear Power Plant from 1984 to 1986.

- Full-scope construction support and construction management services for the decommissioning of the Shippingport station reactor.

2.5.4.3 Waste Handling and Packaging Experience

Westinghouse has experience in providing effective packaging and safe transportation of these packages. In 1989, Westinghouse subsidiaries made over 700 shipments of radioactive materials to disposal sites. These shipments were in accordance with 49 CFR, 10 CFR, and applicable federal, state, and burial site criteria.

The Westinghouse team has demonstrated its ability to handle, package, and transport transuranic (TRU) waste for many years at Hanford, Washington; Savannah River, South Carolina; West Valley, New York; Shippingport, Pennsylvania; Oak Ridge, Tennessee; Fernald, Ohio; Ottawa, Illinois, and Montclair, New Jersey, as well as at more than 60 other nuclear sites throughout the United States. This expertise precludes the problems associated with inadequate packaging or labeling, and ensures that transport equipment is in top condition and drivers are trained and dedicated to safe and

efficient hauling of radioactive waste. This expertise and techniques, combined with a complete array of in-house equipment and capabilities, will provide a comprehensive waste management program, of which packaging and transportation are integral parts. Table 2.5-3 highlights the experience the Westinghouse team has in handling, packaging and disposing of various types of wastes expected to be involved in the Fort St. Vrain project.

MK-Ferguson has been responsible for handling and packaging of radioactive materials/waste on various projects over the last 30 years. Two projects of special note are:

1. The Shippingport modification project in the mid-70's included removal of major components and interferences to modifying the unit to a light water breeder reactor. MK-Ferguson prepared detailed work procedures and satisfied requirements to ship all waste materials from Shippingport to Barnwell.

2. The INEL Chemical Processing Facility project included total decontamination and removal of existing systems and components used to process expended fuel preparatory to vitrification. All materials were catalogued, packaged and shipped for long term storage without incident.

Westinghouse has demonstrated the ability to handle, package, and transport greater-than-Class-C waste (GTCC), for customers such as Monsanto Corporation in Dayton, Ohio. Westinghouse also developed the procedures for handling the GTCC waste expected to be encountered during decommissioning of the mixed oxide facility at Nuclear Fuel Services in Erwin, Tennessee.

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	PROJECT MANAGEMENT	PROJECT CONTROLS	DESIGN ENGINEERING	REMOTE TOOLING	QUALITY ASSURANCE	QUALITY	
SHIPPINGPORT DECOMMISSIONING	MK-F Ⓦ	MK-F Ⓦ	MK-F	Ⓦ	Ⓦ	MK-F Ⓦ	MK-F Ⓦ
SAVANNAH RIVER PLANT	Ⓦ MK-F	Ⓦ MK-F	Ⓦ	Ⓦ	Ⓦ MK-F	Ⓦ MK-F	Ⓦ MK-F
WEST VALLEY FUEL REPROCESSING PLANT	Ⓦ	Ⓦ	Ⓦ	Ⓦ	Ⓦ	Ⓦ	Ⓦ
OLD DOMINION ELECTRIC FOSSIL PLANT			Ⓦ		Ⓦ	Ⓦ	
WISCONSIN ELECTRIC STEAM GENERATOR REPLACEMENT PROGRAM	Ⓦ MK-F	Ⓦ MK-F	Ⓦ	Ⓦ MK-F	Ⓦ MK-F	Ⓦ MK-F	Ⓦ MK-F
AEP STEAM GENERATOR REPLACEMENT	Ⓦ MK-F	Ⓦ MK-F	Ⓦ	Ⓦ MK-F	Ⓦ MK-F	Ⓦ MK-F	Ⓦ MK-F
SHIPPINGPORT PLANT MODIFIED PROGRAM	Ⓦ MK-F	Ⓦ MK-F	Ⓦ	Ⓦ	MK-F Ⓦ	MK-F Ⓦ	MK-F Ⓦ
HANFORD SITE	Ⓦ	Ⓦ	Ⓦ	Ⓦ	Ⓦ	Ⓦ	Ⓦ
A1W/A4W REACTOR PROGRAM	Ⓦ MK-F	Ⓦ MK-F	Ⓦ	Ⓦ	Ⓦ MK-F	Ⓦ MK-F	Ⓦ MK-F
INEL	Ⓦ MK-F	Ⓦ MK-F	Ⓦ		Ⓦ MK-F	Ⓦ MK-F	MK-F Ⓦ
FLORIDA POWER CORPORATION	MK-F	MK-F			MK-F	MK-F	MK-F

CONTRACT ADMINISTRATION	RADIOLOGICAL ENGINEERING	WASTE PACKAGING & DISPOSAL	WASTE TRANSPORTATION	RECORDS MANAGEMENT	PROJECT C/O	CRAFT LABOR MANAGEMENT	REACTOR VESSEL DISMANTLEMENT	SITE/FACILITY SERVICES	SITE/FACILITY MODIFICATIONS	PROCUREMENT MANAGEMENT	WORK PACKAGE DEVELOPMENT
MK-F	MK-F Ⓦ	MK-F	MK-F Ⓦ	MK-F Ⓦ	MK-F	MK-F	MK-F	MK-F	MK-F	MK-F	MK-F
Ⓦ MK-F	Ⓦ	Ⓦ	Ⓦ	Ⓦ MK-F	Ⓦ MK-F	MK-F Ⓦ		MK-F Ⓦ	MK-F Ⓦ	MK-F Ⓦ	MK-F Ⓦ
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Ⓦ	Ⓦ	Ⓦ	Ⓦ	Ⓦ	Ⓦ	Ⓦ	Ⓦ	Ⓦ	Ⓦ	Ⓦ	Ⓦ
Ⓦ MK-F	Ⓦ MK-F	Ⓦ	Ⓦ	Ⓦ MK-F	Ⓦ MK-F	Ⓦ MK-F	Ⓦ	Ⓦ MK-F	Ⓦ MK-F	Ⓦ MK-F	Ⓦ MK-F
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MK-F				MK-F	MK-F	MK-F		MK-F	MK-F	MK-F	MK-F

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TABLE 2.5-1
RELEVANT WESTINGHOUSE TEAM EXPERIENCE

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TABLE 2.5-2

FACILITIES APPROVED FOR UNRESTRICTED RELEASE

COMPANY	DESCRIPTION	REGULATORY AUTHORITY
Monsanto Corporation Dayton, Ohio	Source Fabrication Facility	US NRC
Watch Dial Facility Ohawa, Illinois	Radium Watch Dial Facility	State of Illinois
Exxon Nuclear Corporation Richland, Washington	Uranium Laser Enrichment Equipment	US DOE
Hittman Nuclear, Inc. Columbia, Maryland	Contaminated Equipment Handling and Repair Facility	State of Maryland
Smith, Kline and French Swedesboro, Pennsylvania	Radioisotopes Research Facility	US NRC
Shippingport Nuclear Plant Shippingport, PA	US Naval Reactors/US DOE Facility	US DOE
Numanco, Inc. Prairieville, LA	Source/Calibration Facility	State of Louisiana
Miles Pharmaceutical New Haven, CT	Isotopes/Process Facility	US NRC

TABLE 2.5-3

WASTE HANDLING AND PACKAGING EXPERIENCE

CLIENT	PROJECT
Upjohn Manufacturing Barceloneta, PR	Underground storage tank leakage assessment
Weber USA, Inc. Sanford, NC	Ground water quality assessment
Goodyear Tire & Rubber Danville, VA	Remedial investigation and feasibility study
First Union National Bank Charlotte, NC	Asbestos survey/removal
Gould, Inc. Cleveland, OH	Asbestos survey
Kenal Peninsula Borough Soldotna, AK	Air monitoring and sample analysis program
IT Corporation Oak Ridge, TN	Volume reduction
New York Power Authority	Radioactive waste reduction and disposal service
State of New Jersey Trenton, NJ	Volume reduction and waste disposal
Carolina Power & Light	Radioactive waste reduction and disposal
Virginia Power	Radioactive waste reduction and disposal
Department of Energy Idaho Chemical Processing Plant	Waste and hazardous material handling and treatment
Georgia Power Company radiological services	Health physics, waste and
Louisiana Power & Light radiological services	Health physics, waste and
Philadelphia Electric Co.	Waste and radiological services

TABLE 2.5-3 (Continued)

WASTE HANDLING AND PACKAGING EXPERIENCE

CLIENT	PROJECT
Long Island Lighting Co.	Waste and radiological services
Public Service Electric & Gas	Radiation protection training
Union Electric	Preoperational health physics appraisal
DOE-WIPP	Waste packaging and transportation

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PHASE I:

	MK-FERGUSON	WESTINGHOUSE
* Project Management	- Procurement - Safety	- Project Control - General Administration - QA Plan - Licensing/Permitting - Health, Safety & Environment
* Engineering	- Site Preparation Specification - Training Program	- Site Characterization - Decommissioning Plan - Project Manuals - Specifications - Asbestos & Liquid Waste - Testing & Training Program - Engineering Planning
* PCRV D/D Design/ Specifications/ Procedures	- Core Support Floor/ Barrel/Insulation - Lower Plenum	- Preparation/Disassembly - Shield Access - Dismantle Core - Dismantle/Decon/Cleanup - Options - Procedures for Selected Systems
* System D/D Design/ Specifications/ Procedures	- Disassembly Tools - Dismantling Spec. & Procedures	- Tools/Equipment - Site Cleanup
* Site Cleanup Specification/Procedures		- Demobilization - Backfill Option - Procedures
* Solid Waste Management Plan		

PHASE II:

	MK-FERGUSON	WESTINGHOUSE
* Project Management	- General Administration - Site Engineering - Project Closeout	- Project Control - QA - Licensing/Permitting - Health, Safety and Environment
* Common Facilities/ Services	- Site Preparation - Testing & Training - Procurement	- Liquid Waste Disposal - Decontamination - Radiological Surveys/Access

FIGURE 2.5-1
WESTINGHOUSE TEAM RESPONSIBILITIES

PHASE II: (CONTINUED)	MK-FERGUSON	WESTINGHOUSE
* PCRV Dismantlement/ Decontamination	- Initial Prep/Disassembly - Shielded Access - Core Support Floor/ Barrel/Insulation - Lower Plenum - Dismantle/Decon/Cleanup	
* System Dismantlement/ Decontamination	- Preparation/ Disassembly - Dismantling	- Preparation/Disassembly
* Site Cleanup		- Site Cleanup - Demobilization - Backfill Option
* Waste Preparation, Packaging, Shipping Disposal Disassembly	- Dismantling	

FIGURE 2.5-1(Continued)
WESTINGHOUSE TEAM RESPONSIBILITIES

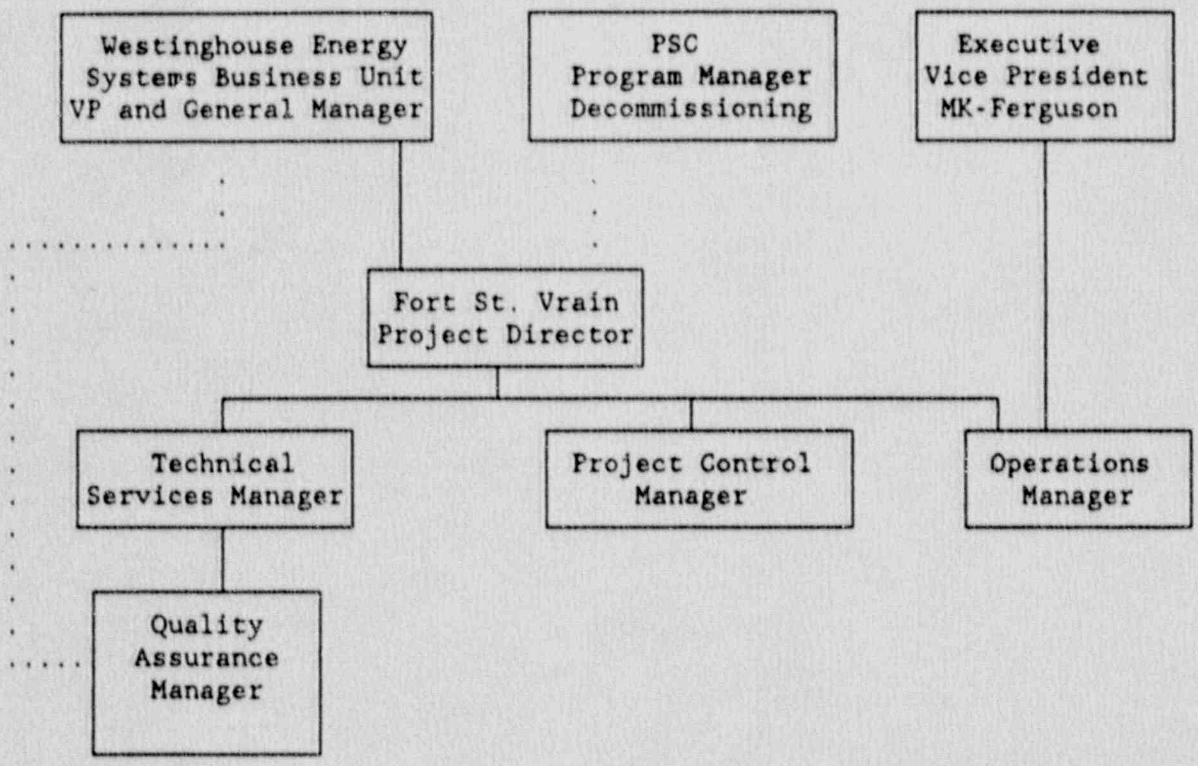

Figure 2.5-2
Westinghouse Team Organization Chart

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2.6 TRAINING PROGRAM

All personnel who may require access to the work areas or a radiologically controlled area associated with the Fort St. Vrain Decommissioning, whether PSC employees, contractor employees, or visitors, shall receive appropriate training commensurate with the potential hazards to which they may be exposed.

2.6.1 General Employee Training

General Employee Training (GET) will be provided to all personnel assigned to decommissioning on a regular basis. This training will include:

1. Site orientation/Access Control.
2. Introduction to Radiation Protection.
3. Fire protection.
4. Quality assurance.
5. Industrial safety.
6. Emergency response.

2.6.2 Radiation Worker Training

Basic radiation worker training shall be provided to persons who routinely work in radiologically controlled areas of the project. Basic radiation worker training covers a large range of topics including:

1. Fundamentals of radiation.
2. Biological effects of radiation.
3. External radiation exposure limits and control.
4. Internal radiation limits and controls.
5. Contamination limits and controls.
6. Management and control of radioactive waste, including waste minimization practices.
7. Response to emergencies.
8. Radiation Protection Program.

In addition to a classroom presentation of the topics identified above, participants in basic radiation worker training are required to participate in the following demonstrations:

1. The proper procedures for donning and removing a complete set of protective clothing (excluding respiratory protection equipment).

2. The ability to read and interpret self reading dosimeters.

3. Proper procedures for entering and exiting a contaminated area, including use of proper frisking techniques.

4. An understanding of the use of an Radiation Work Permit (RWP) by working within the requirements of a given RWP.

Personnel completing basic radiation worker training are required to pass a written examination on the material presented. Completion of this training qualifies an individual for unescorted access to radiologically controlled areas of the project.

2.6.3 Specific Job Training

Specific job training will be provided to selected workers based upon their job assignments and their need to know. Training programs shall assure the following:

1. Personnel responsible for performing activities are instructed as to the purpose, scope, and implementation of applicable controlling procedures.

2. Personnel performing activities are trained as appropriate, in principles and techniques of the activity being performed.

3. The scope, objectives, and methods of implementing the training programs are documented.

Examples of this training are as follows:

1. Respirator training.
   Personnel whose work assignments require them to use respiratory protection devices receive training in the devices that they are required to use. The training program follows the requirements of 10 CFR 20.103 and Regulatory Guide 8.15, "Acceptable Programs for Respiratory Protection" (Ref. 3). Training consists of a classroom session and a simulated work session; in addition, fit testing and medical evaluations are required in order to use respiratory protection devices.
2. Asbestos worker training.
3. Mock-up training.
4. Training on use of special tools or equipment.
5. Work package briefings.

6. Fire watch.
7. Radioactive material transportation training.
8. Health physics technician training.
   Training and qualification of health physics, technicians and supervisors will be conducted in accordance with ANS 3.1-1981 (Ref. 4).
9. Fire brigade training.

2.6.4 Non-Radiation Worker Indoctrination

All non-radiation workers who require access to a radiologically controlled area will receive an appropriate indoctrination prior to entering the area. This indoctrination will include as a minimum:

1. The requirement that non-radiation workers remain with their escort at all times and follow the directions of the escort.

2. A description of the radiological conditions and required controls of the area to be entered.

3. The purpose and proper use of dosimeters, including how to read a self-reading dosimeter and the appropriate exposure limits.

4. Potential emergency situations and proper actions to take in such events.

2.6.5 Training Records

Records of training will be maintained which will include trainees name, date of training, type of training, test results, authorization for protective equipment use, and instructors name. A list of qualified instructors will be maintained.

Training records will be organized in several ways, to allow either a listing of an individuals qualifications or listings of personnel due for retraining. The interval between training and retraining will be identified, as appropriate, in training procedures.

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2.7 REFERENCES FOR SECTION 2

1. USAEC Regulatory Guide 1.86 "Termination of Operating Licenses for Nuclear Reactors", June 1974.

2. "Evaporation Atlas for the 48 Contiguous United States", NOAA Technical Report NWS-33, Department of Commerce, 1982.

3. US NRC Regulatory Guide 8.15 "Acceptable Programs for Respiratory Protection," October 1976.

4. "Selection, Qualification and Training of Personnel for Nuclear Power Plants," ANS 3.1-1981.

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SECTION 3
PROTECTION OF OCCUPATIONAL AND PUBLIC HEALTH AND SAFETY

3.1 FACILITY RADIOLOGICAL STATUS

3.1.1 Facility Operating History

Construction of the Fort St. Vrain Nuclear Generating Station was authorized by the NRC by issuance to Public Service Company of Colorado a provisional construction permit on September 17, 1968. Construction was complete in December 1973. Fuel was loaded and nuclear criticality achieved on January 31, 1974. After a prolonged period of startup testing, low-power operation and plant modifications, the plant was committed for commercial operation July 1, 1979. Full power operation was achieved on November 16, 1981.

In August 1989, the plant was shutdown due to control rod drive problems. Due to these problems, as well as additional mechanical and financial concerns, the PSC Board of Directors decided not to restart the plant. This announcement was made August 29, 1989. PSC has now commenced defueling and has begun preliminary plant closure activities.

During the operational history of the plant there have been no spills or release of radioactive effluents resulting in significant residual radioactive contamination either onsite or offsite. However, there have been a few routine plant operations that may have resulted in residual radioactive contamination in areas which are inaccessible.

Specifically, the Fuel Storage Wells (FSWs) and Equipment Storage Wells (ESWs) on the refueling floor were used to store spent fuel and highly radioactive components. Over the years of transferring various components and spent fuel, it is anticipated that high levels (e.g. > 5,000,000 dpm/100 cm^2) of loose surface contamination will have accumulated on horizontal surfaces. The lower portions of these wells are inaccessible at present (See Figure 2.2-13). At various times throughout plant history, the Hot Service Facility (HSF) has also had levels of loose surface contamination measuring greater than 5,000,000 dpm/100 cm^2. Periodic decontamination of the HSF was typically performed using water, and as a result, crud traps may have been created in inaccessible areas. To date, no crud traps have been identified in accessible areas containing drain piping from the HSF (See Figure 2.2-15).

3.1.2 Radiation Sources

3.1.2.1 Description of Instrumentation and Survey Techniques

In August 1990, radiation and contamination surveys were performed in the Reactor and Turbine Buildings. These surveys focused on identifying of the major contributors to radiation levels above background and areas containing both fixed and loose surface contamination.

The radiation surveys were performed using the instruments listed below and were performed to detect gamma radiation only. Radiation levels were reported in units of mRem/hr. Radiation levels are measured either as general area (approximately waist high), contact (typically measured with the probe within one inch of the radiation source), or at a distance from the contact reading (approximately 18 inches from the source of radiation).

Instrument	Scale	Range/Switch Settings
Eberline RO-2	mRem/hr	0-5/0-50/0-500/0-5000
Ludlum 19	microR/hr	0-25/0-50/0-250/0-500/0-5000

Fixed contamination surveys were performed using Eberline RM-14/15 friskers which measure beta-gamma contamination in counts per minute (cpm) using a scale of 0 - 500 cpm with switch settings of x1, x10, x100, and x1000 (x1000 available on the RM-15 only). Conversion from cpm to disintegrations per minute (dpm) uses a conservative counting efficiency of ten percent. Survey results are reported in units of dpm/probe area, which is approximately 15 square centimeters.

The counting of wipes (or smears) for loose surface contamination was performed using either a Tennelec LB 5100 or a Harshaw TASC-12-A-6 which analyzed beta activity only. Although the minimum detectable activity (MDA) will vary slightly on a daily basis, the typical MDA for these instruments is approximately ten dpm. Results are reported in units of dpm/100 cm^2. (100 cm^2 is the area over which the wipe/smear is taken, approximately four square inches).

Radiological surveys in the past have shown that alpha contamination (both fixed and loose surface) is not present above natural background levels at Fort St. Vrain. Spot checks for alpha contamination are performed on a routine basis to confirm this.

Generally, the results of these surveys demonstrated that greater than 95% of the plant areas have radiation levels corresponding to

natural background (in the 0.004 to 0.032 mRem/hr range). In the results summarized in Table 3.1-1 at the end of this section, only those areas with radiation levels above these background levels are noted.

Additionally, fixed contamination levels are generally less than 1000 dpm/15 cm^2 and loose surface contamination levels of less than 1000 dpm/100 cm^2. Most survey results are less than 100 dpm/100 cm^2. In some locations, tritium may be present as fixed contamination. Due to the low energy beta activity emitted by tritium (Eavg = 0.005 MeV), normal survey methods will not detect the tritium and therefore actual tritium levels are not measured. Fixed contamination is typically imbedded within the first few centimeters of concrete surfaces.

The contribution to area radiation levels from facilities, rooms and structures where various components are undergoing routine plant maintenance activities were not included in the survey results due to the temporary, transient nature of such activities.

Figures 3.1-1 to 3.1-19 provide specific results of these area radiation surveys. Table 3.1-1 provides a summary of the survey results with a description of the major contributors to the radiation levels. Reactor and Turbine Building elevations are shown in Figure 3.1-20. Where results are not listed, contamination and/or radiation levels are not greater than background levels. Systems which are potentially contaminated are identified in Table 3.1-1 by system number for each elevation on which they are located.

3.1.2.2 Turbine Building Survey Results

General area radiation levels throughout the Turbine Building are primarily due to natural background. Contamination levels (both fixed and loose) are less than 1000 dpm/100 cm^2 in all locations and generally less than 100 dpm/100 cm^2. Piping from the potentially internally contaminated Systems 11 and 73 extends from Level 7 (El. 4829') to the roof of the Reactor Building.

3.1.2.3 Radiation Sources Outside the Reactor and Turbine Buildings

Radioactive materials are stored on a temporary basis inside Sea-Vans and cargo trailers. The locations of these trailers are indicated on Figure 3.1-21. Varying amounts of radioactive materials may be stored in these trailers, but external radiation levels are typically less than 0.2 mRem/hr.

The only permanently contaminated area outside the Reactor and Turbine Buildings is the Compactor Building directly east of the main cooling tower (see Figure 3.1-1 and 2.2-1). General area radiation levels vary from 0.2 to 0.5 mRem/hr primarily due to residual contamination inside a radioactive waste compactor. Loose surface contamination levels are generally less than 100 dpm/100 cm^2. The compactor contains loose surface contamination of 50,000 dpm/100 cm^2 and fixed contamination levels of 50,000 dpm/100 cm^2. There are two concrete bunkers in the Compactor Building which have loose surface contamination levels of 5,000 dpm/100 cm^2 and fixed contamination levels in the first few centimeters of the concrete averaging approximately 20,000 dpm/100 cm^2. The presence of tritium is also suspected in the fixed contamination of the bunkers. This building is also used for staging of radioactive wastes (including liquids) and materials.

Piping associated with the Radioactive Liquid Waste System (System 62) also runs underground from the exit point from the Reactor Building to the main cooling towers. Sample results of oil collected in an associated oil separator have occasionally shown trace amounts of tritium, Co-60, Cs-137 and Cs-134.

Routine surveys do not indicate any radiation or contamination levels above background in the Radiochemistry Laboratory located in the Technical Support Building (See Figure 2.2-1), although small amounts of radioactivity may later be found in drain piping from this facility to the Radioactive Liquid Waste System (System 62).

3.1.3 Current Environmental Radiological Status

3.1.3.1 Beta-Gamma Radiation in Surrounding Environs

The environmental radiological status of the site and surrounding areas has been monitored during the entire pre-operational, operational, and post-operational phases of the plant through the Radiological Environmental Monitoring Program (REMP). This program includes surveillances in surrounding areas to gather environmental data in the following areas: external gamma activity levels, air sampling data, water sampling data, milk data, aquatic pathways, and food products. Sample locations are located near the site boundaries and in outlying areas. Details of the results of these surveillances can be found in Reference 1 and in past REMP reports, which are provided annually to the NRC.

During the spring and summer of 1990, additional data were taken to further characterize the site. Soil samples were taken inside and

outside the protected area, gamma radiation surveys were performed inside the protected area, and downwind air samples were taken with respect to the predominant wind direction (from the NE).

Environmental radiation surveillance data from all past REMP reports and the recent characterization data indicate that the predominant source terms found above natural background levels are due to Chernobyl and past nuclear weapons test fallout. External radiation sources to area residents are due to naturally-occurring background radiation and atmospheric fallout.

The recent characterization data included the exposure rate from gamma-ray emitting radionuclides and were measured using thermoluminescent dosimeters (TLD). The TLD stations were constructed at 72 different locations inside and outside the controlled area boundary. Each station contained packets with two chips of CaF_2(Dy), which are identical to those used in the REMP. The measurement period for the TLDs was 92 days. The mean of the two chips in each station was used to determine the mean exposure rate. The overall mean exposure rate from the TLD packages was 0.32 mRem/day. This value is not statistically different from the mean value found in the 1989 REMP report (Ref. 1) of 0.38 mRem/day for the Fort St. Vrain facility area. Reference 1 indicated that since the inception of power production by the reactor, there has been no detectable increase in the external exposure rate due to planned or unplanned reactor releases.

The concentrations of gross beta activity due to the combination of naturally occurring radionuclides and fission product radionuclides was determined from air samples at two locations downwind from the predominant wind direction. A particulate filter for gross beta analysis and an activated charcoal cartridge for I-131 or noble gas radionuclide analyses were in the sample line. Tritium in atmospheric water vapor is collected passively by silica gel at each of these locations. Sampling methodology was identical to that utilized in the REMP. Fort St. Vrain operational technical specifications no longer require measurement of gross alpha activity. Gross beta activity measured in air particulates was principally due to naturally occurring radionuclides or from soil resuspension. The mean weekly activity air concentrations measured at the northern and southern monitors were 16 femtoCuries(E-15)/m^3. These concentrations are comparable to those found in the REMP program. Past REMP data has shown that there has never been a significant difference observed between facility and reference sites (Ref. 1). It is concluded, therefore, that based on the current radiological data and past REMP data, the reactor air effluents of

particulate fission products or activation products are not a source of dose commitment for the Fort St. Vrain environs population.

3.1.3.2 Soil Samples

Soil samples were taken at 124 locations inside and outside the controlled area. Samples were taken at each location from a depth of ten centimeters and an area of 95 square centimeters. Two samples were taken at each location to produce a sample size sufficient to fill a one quart volume. Samples were dried, ground to a constant density, and sealed in the quart container. After a three week period, each container was counted using Ge(Li) gamma-ray spectroscopy to determine the activity concentration of important fission products, activation products and naturally occurring radionuclides.

Deep core samples (taken at approximately 12 percent of the soil sample locations) were taken to approximately 150 centimeters in depth. The core samples were collected in polyethylene tubes, which were frozen and sectioned off to obtain samples at various depths. The deep core samples were analyzed using the same techniques as the soil samples.

Results of the soil samples indicate the presence of statistically significant Cs-137 concentrations. These concentrations are due to world-wide fallout remaining from the United States, USSR and Chinese nuclear weapons tests, and the Chernobyl accident. This is supported by the fact that the Cs-137 concentrations are the same in the entire front range of Colorado and other reactor-generated fission products or activation products were not present in the samples.

3.1.3.3 Results of REMP Surveillances

Tritium is the only radionuclide that was detected in concentrations above background in any effluent pathways that could be attributed to reactor operation. Since tritium is released as tritiated water, the dilution by the surrounding hydrosphere is significant. Elevated levels of tritiated water (Ref. 1) were detected in downstream surface water samples on occasion, but the yearly mean values of downstream surface water was not statistically greater than upstream concentrations. Tritium concentrations measured in milk were all less than the lower limit of detection (LLD). However, slight increases in the downstream tritium levels, which were discussed in the 1986 REMP report, showed that the radiation dose commitment that can be calculated as a result of the increases

was found to be negligible as compared to natural background radiation dose rates.

The REMP program has, over the years, been shown to be of adequate scope and sensitivity to detect any accidental releases from Fort St. Vrain operation. It is concluded that the dose commitments calculated for the closest inhabitants or other parts of the nearby ecosystems due to reactor operations are negligible. In addition to the REMP data, the most recent characterization data both inside and outside the controlled area boundary supports this conclusion. The negligible release of radioactivity from Fort St. Vrain is due to its unique gas cooled design.

3.1.4 Radionuclide Inventory

3.1.4.1 Activated Components within the PCRV

An activation analysis (Ref. 2) was performed for the PCRV and associated internal components and is provided in Appendix II. The analysis was performed to estimate the isotopic composition, magnitude and extent of residual radioactivity which could be present in the PCRV after the end of operations. The actual operating history of the plant was used in the analysis by considering the total effective full power days (EFPD) generated by the plant until its shutdown in August 1989. The analysis consisted of three sections: (1) neutron flux estimates in the PCRV; (2) activation analysis of the PCRV and internal components; and (3) calculation of gamma dose rates (in air) inside the PCRV due to non-removable (fixed) components.

3.1.4.1.1 Computer Codes

The activation analysis required the use of several computer codes and various input data libraries. The ANISN code (Ref. 3) was used to determine the neutron flux throughout the reactor core and outward through the reflectors, helium flow paths, insulation, PCRV liner and PCRV concrete. The activation of selected components within the PCRV was then determined using the REBATE computer code (Ref. 4). Finally, gamma doses (in air) within the PCRV were calculated using the REBATE, ANISN and other data manipulation codes.

3.1.4.1.2 Material Compositions

Material compositions of components were determined from a variety of sources. In most cases, material compositions were identified

from component drawings which referenced standard material specifications. Assumptions for the number densities of trace elements, such as europium (Eu), cobalt (Co), and niobium (Nb), were based on design manuals, previous analytical investigations and recent regulatory guidance (Ref. 5). In general, the reactor internals are made of carbon steel, graphite or concrete. Few major components are made from stainless steel or Inconel. Details of the actual compositions and trace element assumptions are found in Reference 2, which is provided in Appendix II.

3.1.4.1.3 Computational Models

The analysis was computed using three one-dimensional models: (1) Radial - core center line outward through the PCRV side (see Figure 3.1-22), (2) Axial Up - core center line upward through the PCRV top head and (3) Axial Down - core center line downward through the core support floor. Below the CSF, activation was assumed to be insignificant with the exception of the activation of the top of the steam generator modules due to neutron streaming effects (Ref. 6). Descriptions of each of these models are provided in the following paragraphs.

3.1.4.1.4 Radial Model

The "Radial" model consists of the following components:

1. Side removable reflectors
2. Large permanent side reflectors
3. Boronated side spacer blocks
4. Core barrel
5. Kaowool insulation and insulation cover plates
6. PCRV liner and cooling tubes
7. PCRV concrete and rebar
8. Reflector keys and carbon steel metal shell

The removable (hexagonal) graphite side reflector elements are located just outside of the active core (See Figure 3.1-23). These elements will be removed during defueling. A typical block is approximately 31 inches in height and 14 inches across the flats. These reflectors were modeled in the neutron flux calculations, but not in the activation calculations.

Outside the removable side reflectors are the large permanent side reflector blocks. These blocks are irregular in shape (See Figure 3.1-23) and have an average volume of 3.358E+05 cc each.

Between the large permanent side reflectors and the core barrel are the boronated side spacer blocks (Figure 3.1-23). These graphite blocks contain boronated stainless steel pins which provided neutron shielding during power operations. The number of pins vary with respect to the blocks position relative to the active core region.

The core barrel (Figure 3.1-23) is located just beyond the boronated spacer blocks and serves as the lateral restraint of the fuel and reflectors. The barrel is constructed of carbon steel, in three sections which vary in thickness from 2.25 inches to 2.75 inches and is approximately 29 feet in height. The core barrel was modeled in two sections because the upper 12 feet is constructed of a slightly different material than the bottom two sections.

Continuing outward from the core barrel, Class A Kaowool insulation and cover plates (Figure 3.1-24) cover the inside of the PCRV liner. The insulation is a ceramic fiber material and the cover plates are constructed of carbon steel.

The PCRV liner (Figure 3.1-24) is a 3/4-inch carbon steel plate vessel in the form of a right circular cylinder, 75 feet in height with an inside diameter of 31 feet. Carbon steel cooling tubes, welded to the outer (concrete) side of the liner, provided cooling to the concrete during power operations. The liner and cooling tubes were modeled homogeneously for the activation analysis.

The PCRV serves as containment of the nuclear steam supply system (NSSS). The concrete walls vary in thickness from 9 feet to 15-1/2 feet, and the vessel is approximately 106 feet high. The PCRV was modeled as a homogeneous mixture of concrete and rebar.

Two final components modeled were the carbon steel side reflector block keys (Figure 3.1-23) which connect the core barrel to the large side reflectors and the carbon steel metal shell for the top most large side reflectors (half length reflectors).

3.1.4.1.5 <u>Axial Up Model</u>

The "Axial Up" model included the following components:

1. Metal clad reflector blocks (MCRBs)
2. Region constraint devices (RCDs)
3. Lower orifice valve assembly
4. Kaowool insulation and insulation cover plates
5. PCRV liner and cooling tubes
6. PCRV top head concrete and rebar

The MCRBs are located on the top most level of the core area (See Figure 3.1-23) and provided structural stability and neutron shielding during power operations. All blocks are hexagonal in shape, approximately 15 inches in height and 14 inches across the flats. The 37 central column MCRBs (Figure 3.1-25) are constructed primarily of stainless steel. The remaining 270 MCRBs, with and without coolant holes (Figure 3.1-26), are constructed of carbon steel.

The RCDs (Figure 3.1-27) provided restraint of fuel regions during power operations. The RCDs are located on top of the MCRBs, keying fuel columns between regions together. The triangular main body of the device is made of carbon steel, approximately 5 inches thick. The "legs" of the RCD are approximately 7 inches in length and are composed of Inconel.

The orifice valve assembly (Figure 3.1-28) is located just above the central column MCRB. The lower portion of this assembly, primarily composed of carbon steel, was modeled as part of the axial up model.

The final three components (Kaowool/cover plates, PCRV liner/cooling tubes and PCRV concrete/rebar) were modeled as previously discussed in the radial model.

3.1.4.1.6 <u>Axial Down Model</u>

The "Axial Down" model included six components:

1. Removable bottom reflectors
2. Core support blocks and core support posts
3. Silica block insulation
4. Kaowool insulation and insulation cover plates
5. CSF liner and cooling tubes
6. CSF concrete and rebar

Directly beneath the active core are removable hexagonal bottom reflectors (Figure 3.1-29). These include graphite reflectors, graphite reflectors containing boronated Hastelloy-X cans and graphite transition reflectors which channel coolant from the bottom reflectors to the core support blocks. The core support blocks and core support posts (Figure 3.1-29) are permanent components which lie directly below the removable reflectors and act as support for the fuel and reflectors. Three layers of Class C silica insulation (blocks) are located above the cover plate/Kaowool which are just above the CSF liner (See Figure 3.1-30). The CSF liner is a

3/4-inch carbon steel liner encasing the five foot thick concrete/rebar core support floor (See Figure 3.1-29).

3.1.4.1.7 Activation Analysis Results

The results of the activation analysis are summarized in Table 3.1-2. Detailed results can be found in Appendix II. The nuclides of importance as well as the total estimated radionuclide inventory for activated components inside the PCRV are listed in the table.

The dominant nuclides for metallic components are Fe-55, Co-60, Ni-63 and Mn-54. Traces of Nb-94 and Fe-59 are also present in some metallic components. The dominant gamma emitter in the stainless steel components was determined to be Co-60, although Nb-94 is also present. Due to the high concentrations of Co-60 in the boronated spacers blocks, these components are the primary dose contributors inside the PCRV.

The activity in graphite components is dominated by tritium and Fe-55, which were generated due to impurities in the graphite. Due to the large volume of graphite and the high curie content of tritium and Fe-55, these components are the largest contributors to the overall radionuclide inventory. No credit was taken for the migration of tritium out of the graphite.

The Kaowool insulation and silica blocks were determined to have fairly low activities. The carbon steel cover plate contains almost all the activity in the Kaowool/cover plate assemblies. The silica block activity is dominated by Fe-55.

The PCRV concrete/rebar mixture contains many activation products due to the presence of trace elements. In the short term, Co-60 is the dominant gamma emitter, while Eu-152 and Eu-154 are the dominant long term gamma emitters. The nuclide contributing most to the total activity is Fe-55. Other nuclides present in lower activities were: Cs-134, Ca-45, Ag-110m, tritium, C-14, Fe-59, Ni-59, Ni-63, Nb-94, Mn-54, and Ca-41.

Specific details of the calculated isotopic breakdown for each activated component can be found in Appendix C of Appendix II.

As indicated in Table 3.1-2, the majority of the activity in the concrete is contained in the first 1.5 feet in all directions. Table 3.1-3 indicates the estimated required amount of concrete which must be removed to achieve the recommended release limit for unrestricted use (5 microR/hr above background). Table 3.1-3 lists

dose rate estimates for each direction; therefore, the total dose inside the center of the PCRV (in air) is the sum of the dose rate for all three directions. Table 3.1-3 also indicates the estimated dose rate contribution (in air) for various stages of component removal for an individual located in the center of the PCRV.

3.1.4.2 Plateout Analysis for PCRV Internal Components

3.1.4.2.1 Plateout Analysis Bases and Computer Codes

A plateout distribution analysis of radioactive nuclides produced in the reactor core was performed for the PCRV and internal components (Ref. 7). The purpose of this analysis was to estimate the plateout concentrations and distributions in the primary coolant circuit. Analyses were conservatively performed from the beginning of cycle (BOC) 1 to the end of cycle (EOC) 5. The axial and radial core power distributions through fuel cycle 5 were calculated and used with flux distribution data as input to fission product release codes. Full-core fuel and graphite temperature distributions, fuel failure and release of key fission gases and metals were then calculated. Based on the full-core analysis for key fission gases and metals, the total plateout and helium purification system inventories of radioactive nuclides were estimated.

Plateout distributions were calculated using the PADLOC (Ref. 8) computer code. The PADLOC code performs a mass transfer calculation using mass transfer correlations and sorption isotherms to determine the partitioning of condensable radionuclides between the flowing coolant and the fixed surface in a recirculation loop. The plateout model in PADLOC is limited to one-dimensional cylindrical geometry, such that all components of the primary circuit must be modeled as an equivalent series of coupled sections of parallel banks of cylindrical tubes. Reference sorption isotherms were used to describe the sorptive capacity of the primary circuit materials for the radionuclides of concern.

3.1.4.2.2 Plateout Analysis Methodology

Typically, the two dominant sources of fission products released from the core are heavy metal contamination (heavy metal outside the coated fuel particles) and fuel particles whose coatings fail in service. In addition, the volatile metals (Cs and Sr) can, at sufficiently high temperatures and over long periods of time, diffuse through the silicon carbide (SiC) coatings and be released from the intact fuel particles.

Calculations were performed for the following key nuclides: Sr-90, I-129, I-131, Cs-137, Cs-134 and Te-127m. The source terms for fission product plateout analysis include both a direct release contribution and, where applicable, a precursor contribution. In the case of the cesium isotopes, there is a direct release of both Cs-137 and Cs-134 metal from the core. Cs-137 plateout also results from the release and subsequent decay of its precursor contributor, Xe-137. Cs-134 has no gaseous precursor. Similarly for Sr-90, there is a direct Sr-90 metal release as well as the contribution from it Kr-90 precursor. Only direct release contributions are considered fro I-129, I-131 and Te-127m.

3.1.4.2.3 Plateout Analysis Results

It is anticipated that any internal PCRV component that has come in contact with primary coolant will require decontamination or will be removed for disposal as radioactive waste. This includes not only the core graphite and structural components (which are also activated), but also the steam generator modules, helium circulators and Kaowool insulation. The preliminary results of the plateout analysis are shown in Tables 3.1-4 and 3.1-5. Table 3.1-4 lists the plateout concentration (Ci/cm^2) on primary circuit components for the key nuclides, Cs-137 and Sr-90. Table 3.1-5 identifies the integrated plateout (Ci) of primary circuit components for the following nuclides: Cs-134, Cs-137, I-131, I-129, Sr-90 and Te-127m. Additional information on the analysis results, analytical models and comparisons with measured data are located in Reference 7.

Additional plateout analyses will be performed to predict primary system inventories based on the actual end of life burnup. The accuracy of the predicted fuel performance and gas release will be assessed by comparison to measured R/B (Release to Birth Rate) data. The accuracy of the predicted fission metal release data will be assessed by comparison to measured plateout probe data. Predicted aforementioned assessments to provide best estimates of total plateout inventories. Plateout distributions and concentrations will then be calculated for the primary circuit. This study is scheduled for completion in January 1991.

3.1.4.3 Contaminated Systems, Structures and Components

In August 1990, comprehensive radiation and contamination surveys were performed in the Reactor and Turbine Buildings to identify the major contributors to radiation levels above background. Due to on-going maintenance, defueling, and component removal activities in

progress at the time of the survey, it should be noted that radiation and contamination levels may vary due to the movement of various radioactive components. Additionally, certain PCRV internal components may be removed from the PCRV prior to commencement of decommissioning activities which may change radiation and contamination levels elsewhere in the plant.

When compiling the radiation survey results, the contributions from various pieces of portable equipment such as ventilation units, vacuum cleaners, decontamination equipment, etc., were neglected due to the transient nature of their use.

An engineering analysis of the total curie inventory at Fort St. Vrain was completed in June 1989 and the results of this analysis have been summarized in Table 3.1-6. This analysis is based upon past survey results, activation analysis, plateout analysis and general estimation of contamination levels occurring in the various systems. The survey results and estimation of contamination levels were then applied over the estimated surface area of the associated system. This analysis accounts for all expected radioactivity at Fort St. Vrain with the exception of fuel.

Section 3.1.2 contains a detailed summary of the radiation survey results. These surveys were performed to identify general radiation and contamination levels in frequently accessed areas of the facility. More detailed surveys of individual areas will be required when determining specific work plans during actual decommissioning.

3.1.5 Initial Site Characterization Plans

The initial site radiological characterization will be performed to determine the radiological status of Fort St. Vrain balance of plant systems, auxiliary systems, buildings and site within approximately 1000 feet of the Fort St. Vrain facility. Radiological measurements for direct radiation, residual contamination (fixed and removable) will be conducted and recorded. Samples will be taken from strategically selected locations, analyzed and recorded. Results from current Fort St. Vrain radiological data will be used as part of the initial characterization, where appropriate.

The results of the initial site characterization will assist in the determination of final survey plans, frequency of surveys and instrumentation to be used. It will also be used as a general performance indicator to assess the effectiveness of the overall site decontamination. The data will be utilized for radioactive

waste management, assessing potential hazards during the decontamination and decommissioning work, for determining safety controls, and accurately scheduling the decommissioning activities.

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TABLE 3.1-1
RADIOLOGICAL SURVEY SUMMARY

Reactor Building:

Level	Elevation	Internally Radioactive Systems	Source of Radiation/ Contamination	Radiation Levels (mr/hr)	Contamination Levels Loose (DPM/100cm^2)	Contamination Levels Fixed (DPM/15 cm^2)
Level 13	4916'-8"	46, 47				
Level 12	4906'-8"	46, 47				
Level 11	4881'-0"	11, 12, 13, 14, 15, 16, 21, 23, 46, 47, 72, 93	Shine through FSW's and ESW's	Gen. Area - 0.044		
Level 10	4864'-0"	11, 13, 14, 16, 21, 23, 46, 47, 72 93	New Fuel Loading Port	Gen. Area - 0.8 Contact - 6.0	30,000	5,000 - 10,000
			Hot Service Facility	(See results from Level 9 below)		
			Purge Vacuum Pumps	Gen. Area - 0.032		
Level 9	4849'-0"	11, 14, 16, 21, 23, 46, 47, 61, 62, 63, 72, 93	Regeneration System	Gen. Area - 0.15		
			Hot Service Facility	Gen. Area - 0.5	100,000	10,000 - 50,000
Level 8	4839'-0"	11, 14, 16, 23, 46, 47, 61, 62, 63, 72, 93	Access to Hot Service Facility	Gen. Area - 0.5	50,000	
			Hot Service Facility Sump	Gen. Area - 50 Contact - 200	100,000	10,000 - 50,000
Level 7	4829'-0"	11, 14, 16, 46, 61, 62, 63, 72, 93	Irradiated Thermocouples	Gen. Area - 2.8 Contact - 4.0		
Level 6	4816'-0"	11, 46, 61, 62, 63, 72, 93	Gas/Liquid Waste System Piping	Gen. Area - 0.02 Contact - 1.2		

TABLE 3.1-1(Continued)
RADIOLOGICAL SURVEY SUMMARY

Reactor Building:

Level	Elevation	Internally Radioactive Systems	Source of Radiation/ Contamination	Radiation Levels (mr/hr)	Contamination Levels Loose (DPM/100cm²) /100cm²	Contamination Levels Fixed (DPM/15 cm²)
Level 5	4791'-0"	11, 46, 61, 62, 63, 72, 93	Gas/Liquid Waste System Piping	Contact - 0.25		5,000 - 10,000
Level 4	4781'-0"	46, 47, 61, 62, 63, 72 93	Decontamination System	Gen. Area - 0.5 Contact - 3.0	600	500 - 1,000
Level 3	4771'-0"	46, 47, 61, 62, 63, 72, 93	Decontamination Laundry	Gen. Area - 0.4 Contact - 2.2	1,400	100 - 500
			Floor of Vault Containing T-6101			500 - 1,000
Level 2	4756'-0"	46, 47, 61, 62, 63, 72, 93				
Level 1	4740'-6"	21, 46, 47, 61, 62, 63, 72, 93	Gas Waste Compressor Drains (3)			100 - 500
			Liquid Waste Sump		5,600	30,000
Level 1	Below Floor Level	72	Reactor Building Sump			100 - 500

TABLE 3.1-2

ACTIVATION ANALYSIS RESULTS
(Total Curies Three Years After Shutdown)

Fixed Components:	H-3	C-14	Ca-41	Ca-45	Mn-54	Fe-55	Fe-59	Co-60	Ni-59	Ni-63	Nb-94	Ag-110	Eu-152	Eu-154	Others	Total Curies
1. Core Barrel	-	-	-	-	0.11	7.28	<0.01	1.03	-	-	<0.01	-	-	-	0.01	8.43
2. CSF Liner	-	-	-	-	<0.01	139.98	<0.01	2.27	<0.01	0.04	<0.01	-	-	-	<0.01	142.29
3. PCRV Liner	-	-	-	-	0.08	110.34	<0.01	4.34	<0.01	0.03	<0.01	-	-	-	<0.01	114.78
4. CSF/Kaowool Insulation and Cover Plates	-	<0.01	<0.01	-	<0.01	87.20	<0.01	2.24	<0.01	0.08	-	-	-	-	<0.01	89.52
5. CSF Silica Blocks	-	<0.01	<0.01	-	<0.01	246.54	<0.01	6.33	<0.01	0.22	-	-	-	-	<0.01	253.09
6. PCRV Kaowool Insulation and Cover Plates	-	<0.01	<0.01	-	0.01	5.57	<0.01	0.44	-	-	-	-	-	-	0.01	6.03
7. Metal Shell-Large Side Reflector	-	-	-	-	<0.01	0.01	<0.01	<0.01	-	-	-	-	-	-	<0.01	0.01
8. Large Side Reflector and Permanent Hexagonal Blocks	82557.70	-	20.11	77.44	0.30	441114.00	<0.01	3446.24	-	-	-	-	-		.21	527216.00
9. Core Support Blocks	47.19	-	<0.01	0.01	<0.01	69.15	-	0.54	-	-	-	-	-	-	<0.01	116.89
10. Reflector Keys	-	-	-	-	<0.01	0.01	<0.01	<0.01	-	-	-	-	-	-	<0.01	0.01
11. Boronated Spacer Blocks	11531.50	1.02	0.81	3.12	<0.01	47208.60	<0.01	7097.13	2.81	392.45	-	-	-		0.26	66237.70
TOTAL																594,184.75

Removable Components:	H-3	C-14	Ca-41	Ca-45	Mn-54	Fe-55	Fe-59	Co-60	Ni-59	Ni-63	Nb-94	Ag-110	Eu-152	Eu-154	Others	Total Curies
1. Metal Clad Block-CR	-	-	-	-	0.06	18451.70	<0.01	4342.78	2.08	290.39	0.18	-	-	-	0.01	23087.20
2. Metal Clad Block-NCR	-	-	-	-	0.52	169668.20	<0.01	2786.29	-	-	<0.01	-	-	-	<0.01	172454.64
3. Region Constraint Device	-	-	-	<0.01	0.07	71.85	<0.01	48.93	0.01	1.27	0.01	-	-	-	<0.01	122.13
4. Orifice Valve	-	-	-	-	0.17	299.25	<0.01	115.56	-	-	-	-	-	-	<0.01	414.98
5. Reflector Block with Hastelloy Cans	1.38	-	-	<0.01	0.07	301.45	<0.01	3407.48	0.67	88.35	<0.01	-	-	-	<0.01	3799.60
TOTAL																199,878.15

TABLE 3.1-2 (Continued)

Component/Isotope	H-3	C-14	Ca-41	Ca-45	Mn-54	Fe-55	Fe-59	Co-60	Ni-59	Ni-63	Nb-94	Ag-110	Eu-152	Eu-154	Others	Total
Concrete Radial:																
1st Six Inches	0.26	<0.01	<0.01	0.02	<0.01	7.93	<0.01	0.31	<0.01	<0.01	<0.01	<0.01	0.31	0.03	0.03	8.89
2nd Six Inches	0.09	<0.01	<0.01	<0.01	<0.01	2.81	<0.01	0.10	<0.01	<0.01	<0.01	<0.01	0.11	<0.01	0.02	3.13
3rd Six Inches	0.01	<0.01	<0.01	<0.01	<0.01	0.33	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.01	0.37
4th Six Inches	<0.01	<0.01	<0.01	<0.01	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.04
5th Six Inches	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
6th Six Inches	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
7th Six Inches	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
8th Six Inches	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
TOTAL																12.44
Concrete - Top Head:																
1st Six Inches	2.84	<0.01	0.04	0.18	0.01	87.79	<0.01	3.37	<0.01	<0.01	<0.01	0.01	3.45	0.35	0.28	98.32
2nd Six Inches	0.73	<0.01	0.01	0.05	<0.01	22.95	<0.01	0.79	<0.01	<0.01	<0.01	<0.01	0.90	0.08	0.04	25.55
3rd Six Inches	0.07	<0.01	<0.01	<0.01	<0.01	2.26	<0.01	0.08	0.01	<0.01	<0.01	<0.01	0.09	0.01	0.01	2.52
4th Six Inches	0.01	<0.01	<0.01	<0.01	<0.01	0.24	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	0.27
5th Six Inches	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.04
6th Six Inches	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
7th Six Inches	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
8th Six Inches	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
TOTAL																126.71
Concrete - CSF:																
1st Six Inches	0.16	<0.01	<0.01	0.01	<0.01	5.12	<0.01	0.17	<0.01	<0.01	<0.01	<0.01	0.20	0.02	0.01	5.69
2nd Six Inches	0.01	<0.01	<0.01	<0.01	<0.01	0.34	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.01	0.38
3rd Six Inches	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.03
4th Six Inches	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
5th Six Inches	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
6th Six Inches	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
7th Six Inches	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
8th Six Inches	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
9th Six Inches	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
10th Six Inches	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
TOTAL																6.10

TABLE 3.1-3

PCRV DOSE RATES IN AIR
AT 5 YEARS AFTER SHUTDOWN

	Gamma Dose Rate Rem/Hr
Radial	
All components (from large side reflector to PCRV concrete)	9.7E + 01
Large side reflectors removed (from spacers to PCRV concrete)	2.3E + 02
From core barrel to PCRV concrete	2.1E - 02
PCRV liner and concrete only	8.8E - 03
PCRV concrete only	4.5E - 03
22" PCRV concrete removed	6.3E - 06
24" PCRV concrete removed	3.4E - 06
Axial Up	
All components (from Kaowool insulation to PCRV concrete)	1.7E - 01
PCRV liner and concrete only	4.4E - 01
PCRV concrete Only	1.7E - 01
32" PCRV concrete removed	7.6E - 06
34" PCRV concrete removed	4.4E - 06
36" PCRV concrete removed	2.6E - 06
Axial Down	
All Components (from core support blocks to core support floor)	6.1 - 02
PCRV liner and concrete only	2.5E - 01
PCRV concrete only	1.8E - 02
20" PCRV concrete removed	5.3E - 06
22" PCRV concrete removed	2.7E - 06

TABLE 3.1-4

ESTIMATED PLATEOUT CONCENTRATION ON
MAJOR PRIMARY CIRCUIT COMPONENTS
AT EOC5

	Plateout Concentration			
	Sr-90		Cs-137	
Component	dpm/ 100 cm^2	Ci/cm^2	dpm/ 100 cm^2	Ci/cm^2
Lower Reflectors	1.11E07	5.0E-08	2.22E08	1.0E-06
Steam Generator ** (Reheater Section)	2.22E07	1.0E-07	3.33E08	1.5E-06
Circulator	4.44E07	2.0E-08	5.55E07	2.5E-07
Circulator Outlet	3.33E05	1.5E-09	9.99E05	4.5E-09
Core Barrel Annulus	2.22E06	1.0E-08	7.77E06	3.5E-08
Upper Reflectors	2.00E07	9.0E-08	4.44E07	2.0E-07

* Highest estimated concentration on the component
** Steam generator component with the highest estimated plateout concentration.

TABLE 3.1-5

INTEGRATED PLATEOUT IN EACH PRIMARY CIRCUIT COMPONENT AT EOCS

BRANCH NAME	Cs-134** (Curies)	Cs-137** (Curies)	I-131* (Curies)	I-129* (Curies)	Sr-90* (Curies)	Te-127m* (Curies)
Active Core	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Lower Reflector	1.510E+01	1.326E+01	6.077E-03	1.037E-08	5.820E-01	3.196E+01
Core Support Blocks	3.668E-01	3.224E-01	2.923E-04	4.987E-10	1.028E-02	5.664E-01
Core Exit Plenum	8.166E-02	7.195E-02	2.028E-04	3.461E-10	1.937E-03	1.000E-01
Steam Generator Inlet	1.617E-03	1.443E-03	9.125E-03	1.557E-08	1.7703-02	8.049E-01
Steam Generator Reheater	1.029E+01	8.771E-01	6.272E-01	1.066E-06	4.527E-01	1.923E+01
Superheater	2.699E+00	2.305E+00	1.478E+00	2.516E-06	1.544E-01	6.909E+00
Economizer	7.513E+00	6.339E+00	2.788E+01	4.341E-05	2.244E-02	9.067E-01
Evaporator	7.398E+00	6.879E+00	1.120E+03	4.868E-04	8.131E-03	1.696E-01
Steam Gen. Outlet Plenum	2.277E-02	2.272E-02	1.164E+01	2.531E-05	6.615E-04	4.924E-04
Circulators	1.458E-01	1.388E-01	4.432E+00	7.501E-06	8.754E-03	3.305E-03
Circulator Outlet Plenum	5.385E-03	6.882E-03	6.929E+00	2.5073-05	1.274E-03	1.161E-04
Core Barrel/Liner Annulus	1.196E-01	1.886E-01	4.172E+01	8.176E-05	5.435E-02	2.579E-03
Core Inlet Plenum	1.4103-02	3.302E-02	1.943E+01	7.128E-05	1.315E-02	3.041E-04
Upper Reflectors	8.109E-01	2.448E+00	2.702E-01	6.322E-07	1.069E+00	1.752E-02
Side Reflectors	1.053E-03	5.767E-03	1.761E-01	5.441E-07	1.838E-03	2.210E-05
Purification System	1.106E-03	2.902E-03	2.853E+00	3.542E-04	1.293E-03	2.404E-05
TOTAL (EOCS)	3.530E+01	3.290E+01	1.237E+03	1.100E-03	2.400E+00	6.067E+01
TOTAL (3 YEARS DECAY)	1.290E+01	3.071E+01	-	1.1003-03	2.234E+00	5.739E-02

*Based upon the source rate calculated from the xenon data using the square root of half-life dependence.
**Plateout distribution based upon sorption isotherms for unoxidized alloy steel surfaces.

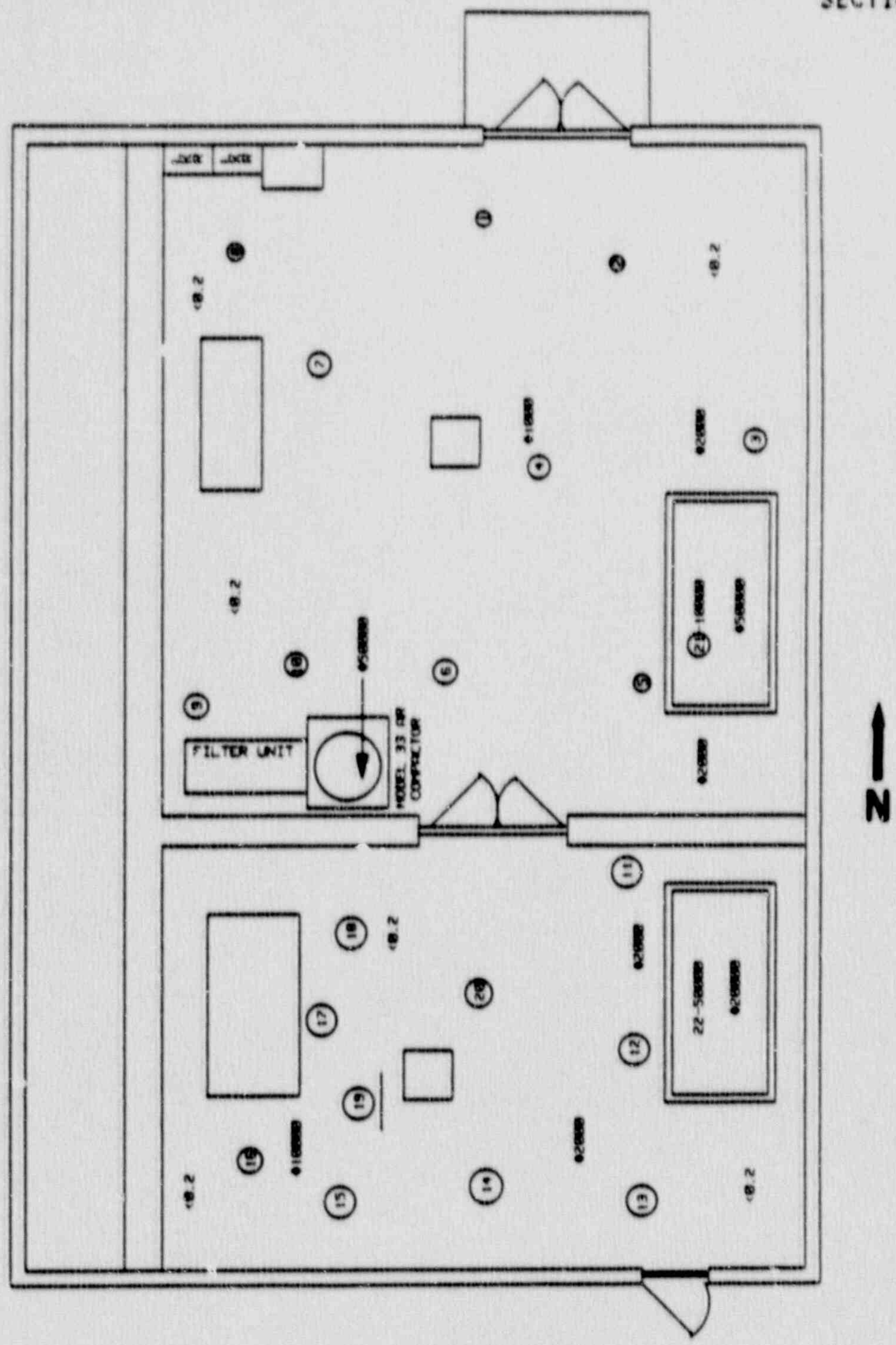
TABLE 3.1-6

ESTIMATED CURIE TOTAL AT FSV
(Three Years After Shutdown)

NOTE: The systems listed below are those systems which are known to be contaminated, on-going maintenance, defueling and component removal may transfer contamination to other systems and/or locations.

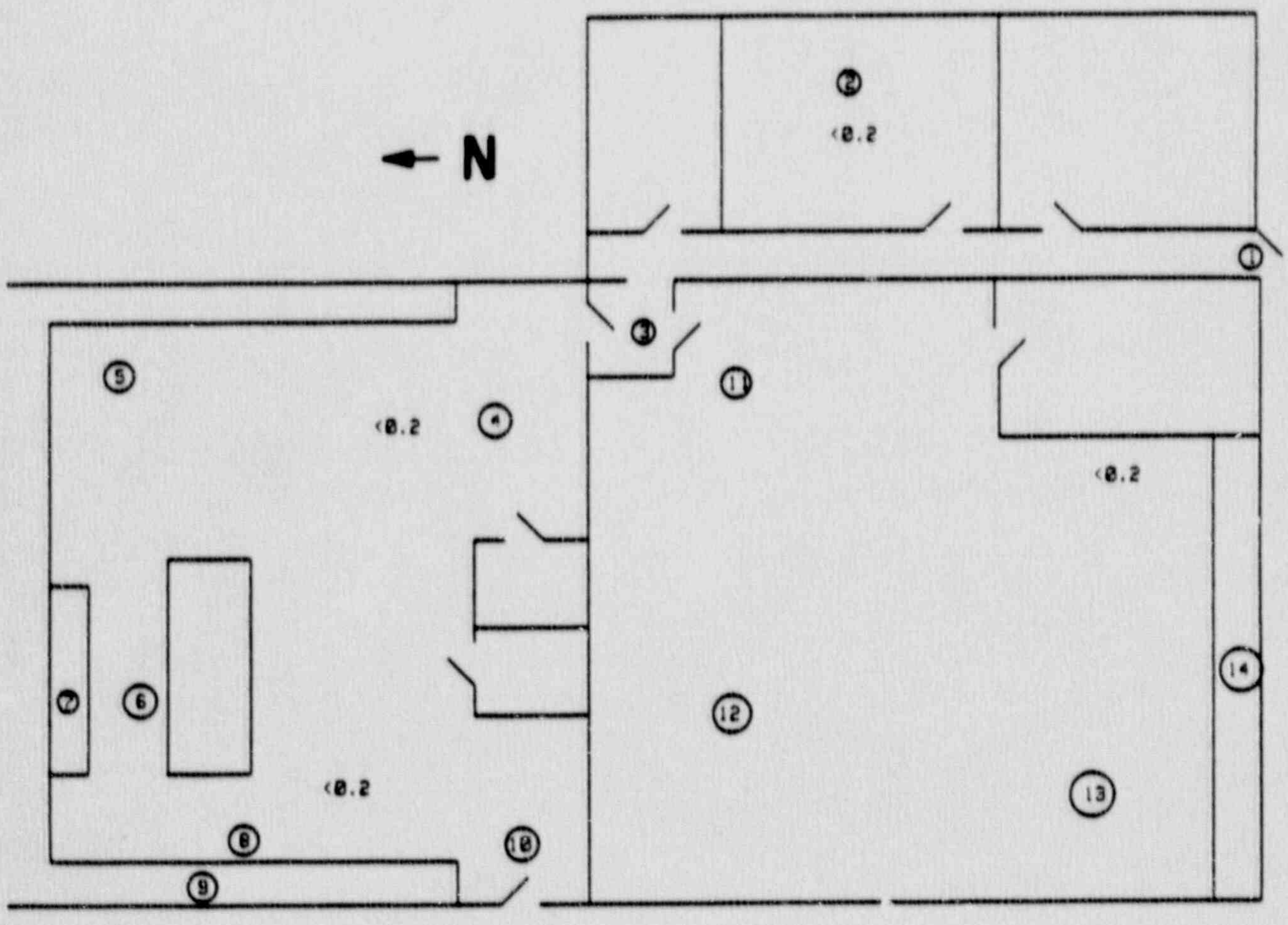
		Total Curies	
System No.	System	From Activation	From Loose Contamination
11	PCRV and Internal Components	7.94 E+05	2.54 E+02
12	Controls Rods and Drives	2.93 E+04	N/A
13	Fuel Handling Equipment	N/A	1.32 E-02
14	Fuel Storage Facility	N/A	3.08 E-02
16	Auxiliary Equipment	N/A	1.33 E-02
17	Reactor Removable Reflector	1.37 E+06	N/A
21	Primary Coolant	N/A	9.66 E+01
22	Secondary Coolant	N/A	9.80 E+03
23	Helium Purification	N/A	4.27 E+00
61	Decontamination Systems	N/A	1.57 E-05
62	Radioactive Liquid Waste	N/A	6.00 E-05
63	Radioactive Gas Waste	N/A	1.20 E-04

* Includes an estimate of loose surface contamination due to activated corrosion products.



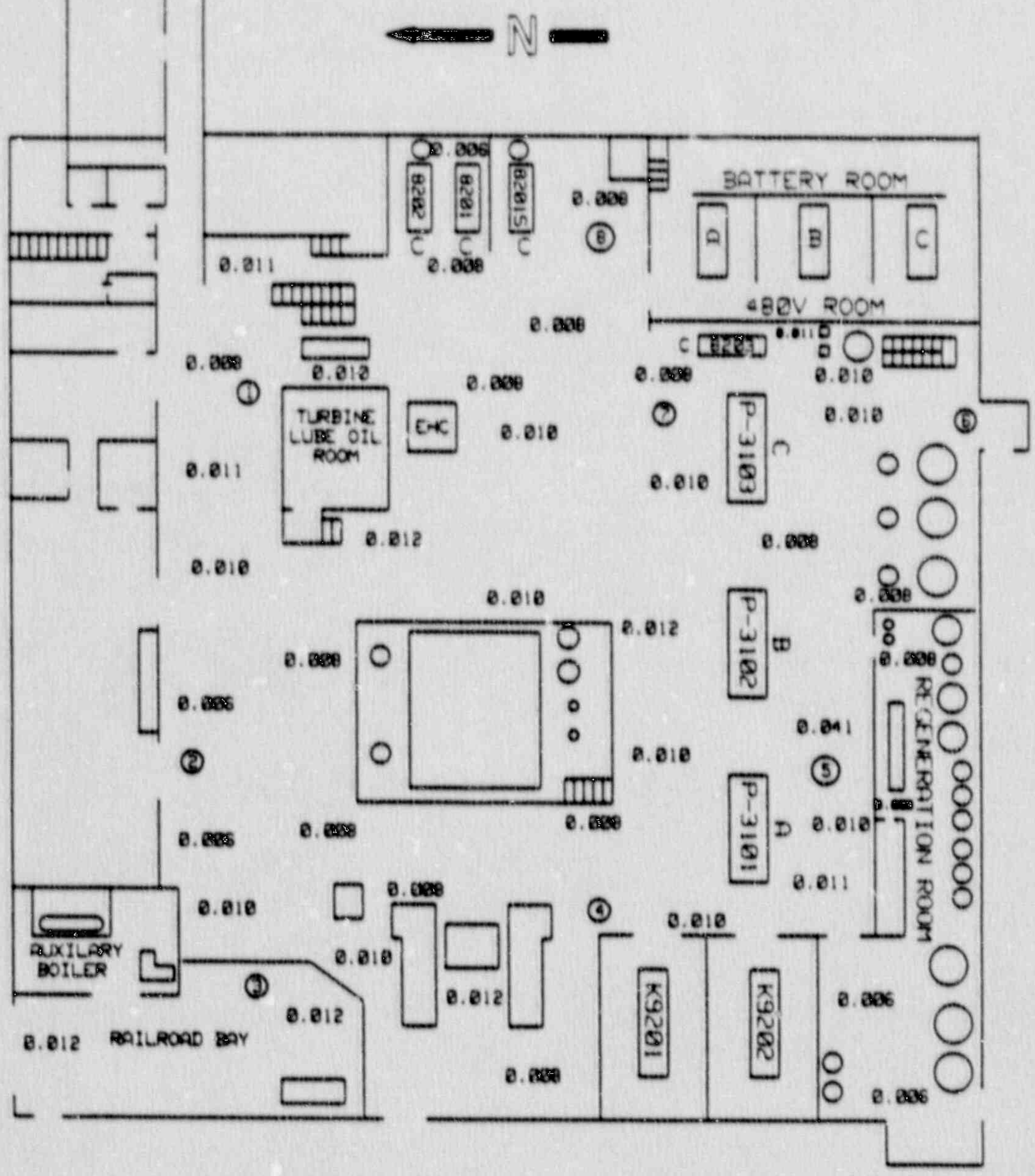
LEGEND: All Radiation levels in mrem/hr
* Denotes contact radiation reading
( ) denotes radiation level an 18 inches
Circled numbers indicate loose surface contamination survey point (all values <100 DPM/100 cm^2 unless a value is adjacent to the circle)

Figure 3.1-1 Compactor Building Radiation Survey



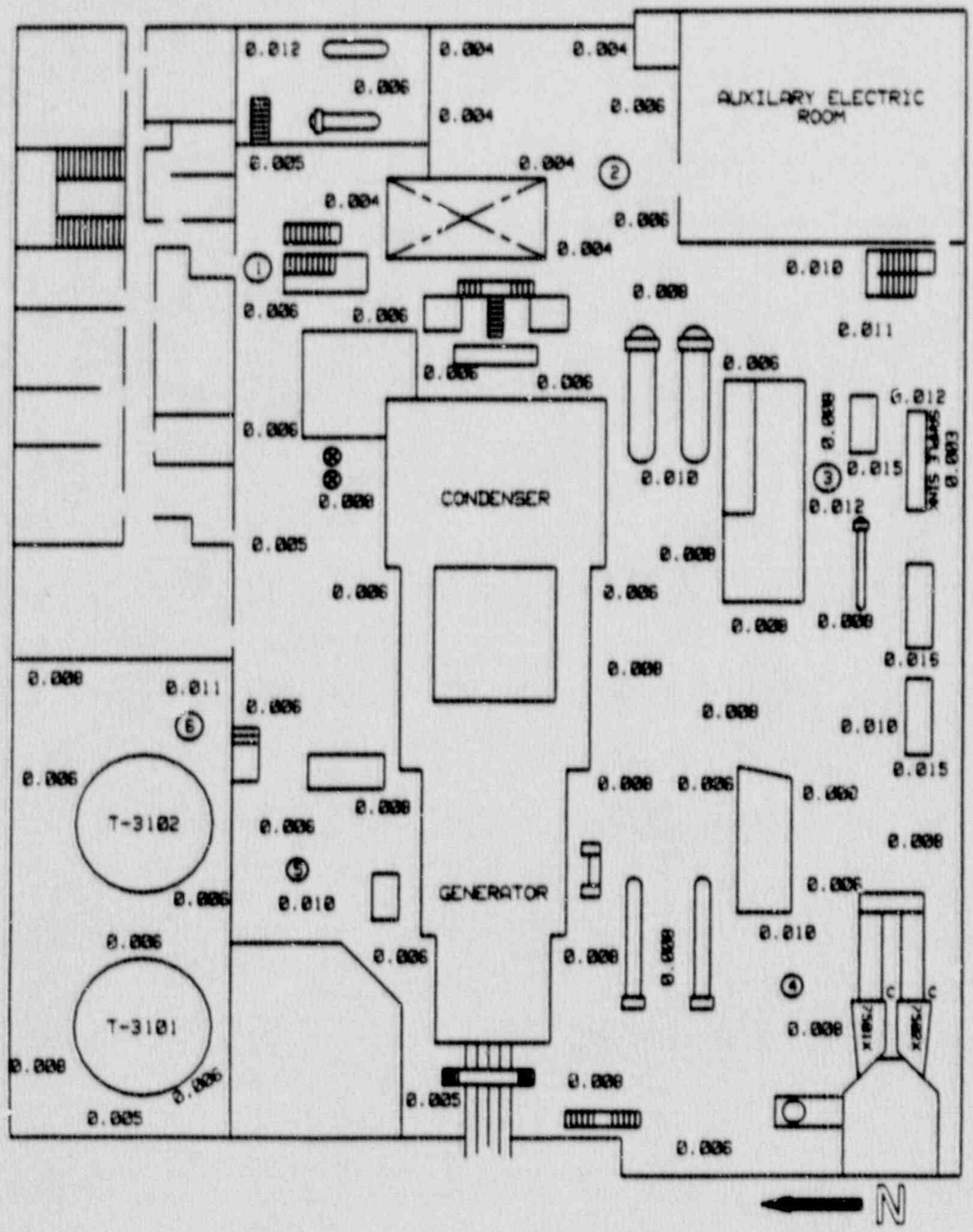
LEGEND: All Radiation levels in mrem/hr
* Denotes contact radiation reading
( ) denotes radiation level an 18 inches
Circled numbers indicate loose surface contamination survey point (all values <100 DPM/100 cm² unless a value is adjacent to the circle)

Figure 3.1-2 Radiochemistry Laboratory Radiation Survey



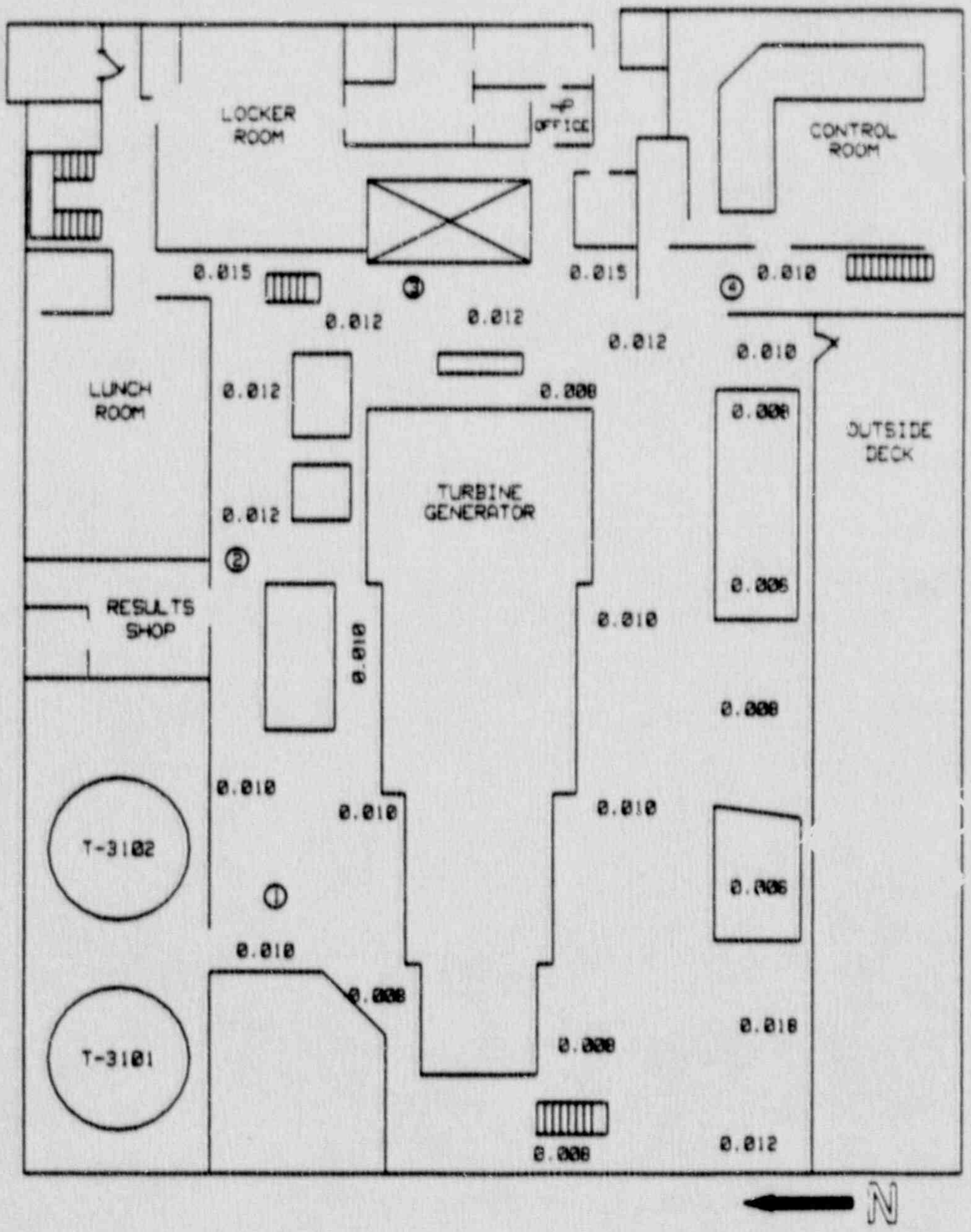
LEGEND: All Radiation levels in mrem/hr
* Denotes contact radiation reading
( ) denotes radiation level an 18 inches
Circled numbers indicate loose surface contamination survey point (all values <100 DPM/100 cm^2 unless a value is adjacent to the circle)

Figure 3.1-3 Turbine Building Radiation Survey - Level 5 (Elev. 4791')



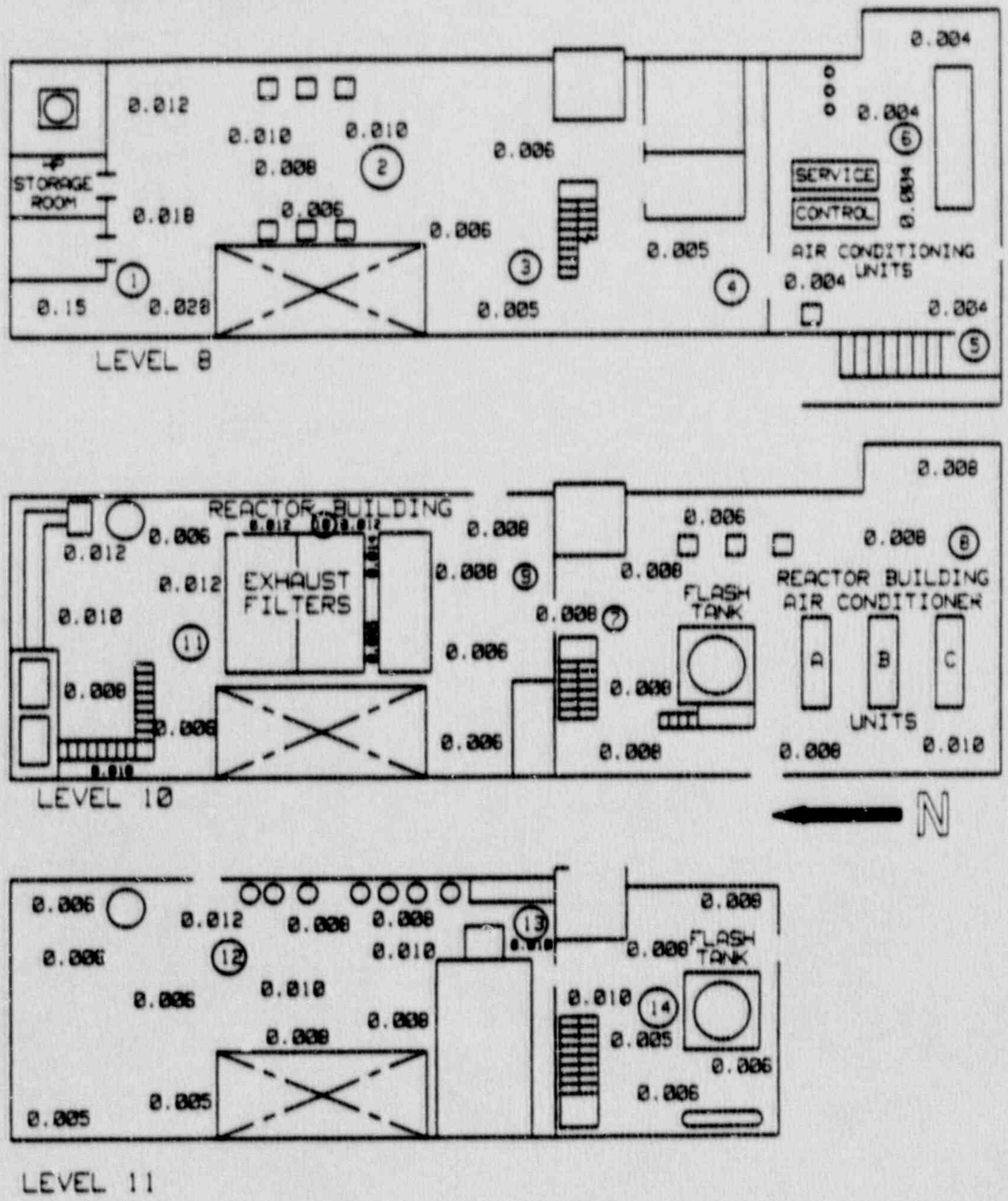
LEGEND: All Radiation levels in mrem/hr
* Denotes contact radiation reading
( ) denotes radiation level an 18 inches
Circled numbers indicate loose surface contamination survey point (all values <100 DPM/100 cm^2 unless a value is adjacent to the circle)

Figure 3.1-4 Turbine Building Radiation Survey - Level 6 (Elev. 4811')



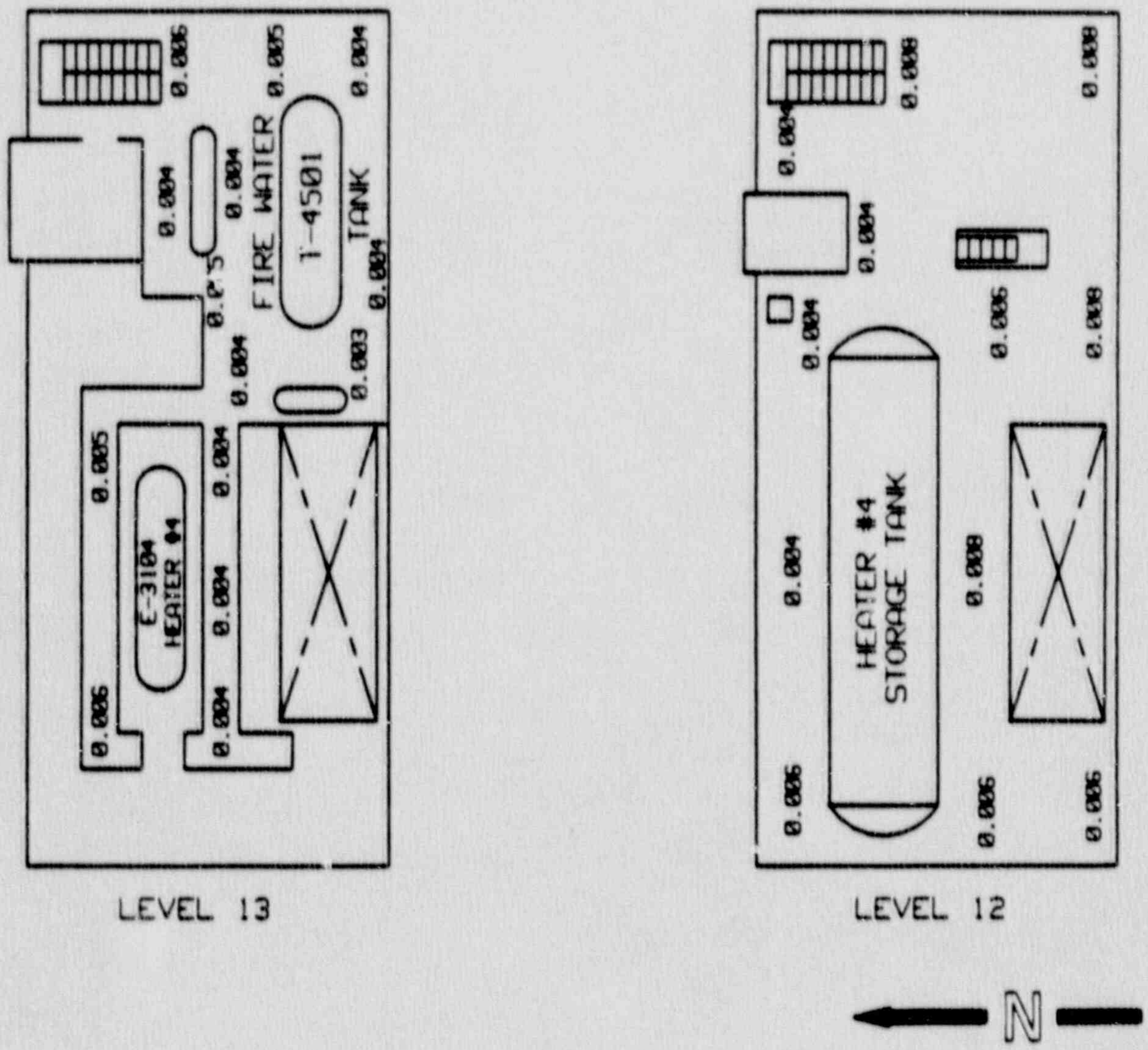
LEGEND: All Radiation levels in mrem/hr
* Denotes contact radiation reading
( ) denotes radiation level an 18 inches
Circled numbers indicate loose surface contamination survey point (all values <100 DPM/100 cm^2 unless a value is adjacent to the circle)

Figure 3.1-5 Turbine Building Radiation Survey - Level 7 (Elev. 4829')



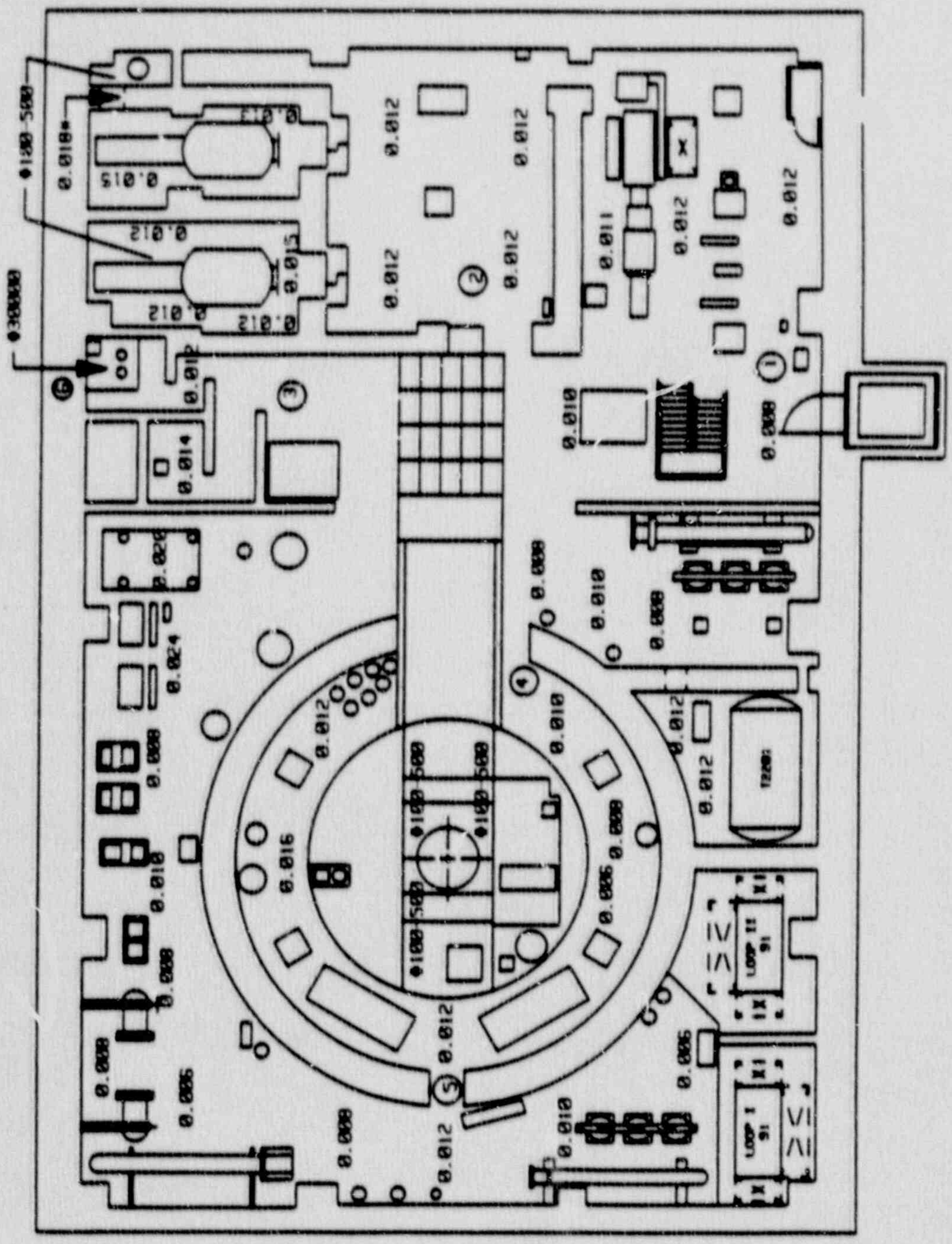
LEGEND: All Radiation levels in mrem/hr
* Denotes contact radiation reading
( ) denotes radiation level an 18 inches
Circled numbers indicate loose surface contamination survey point (all values <100 DPM/100 cm^2 unless a value is adjacent to the circle)

Figure 3.1-6 Turbine Building Radiation Survey - Levels 8, 10 & 11 (Elev. 4846', 4864', 4884')



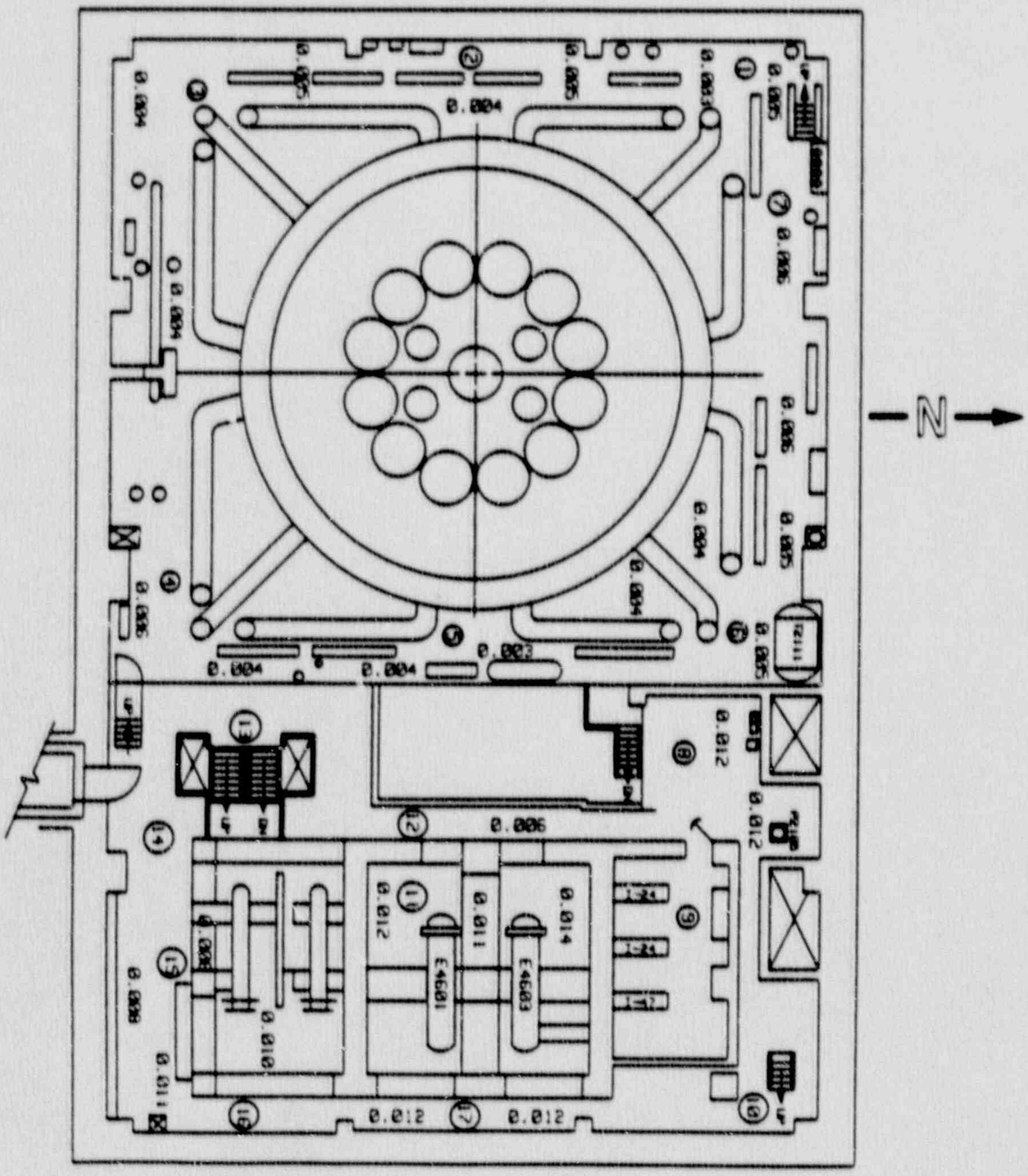
LEGEND: All Radiation levels in mrem/hr
* Denotes contact radiation reading
( ) denotes radiation level an 18 inches
Circled numbers indicate loose surface contamination survey point (all values <100 DPM/100 cm^2 unless a value is adjacent to the circle)

Figure 3.1-7 Turbine Building Radiation Survey - Level 12 & 13 (Elev. 4904', 4921')



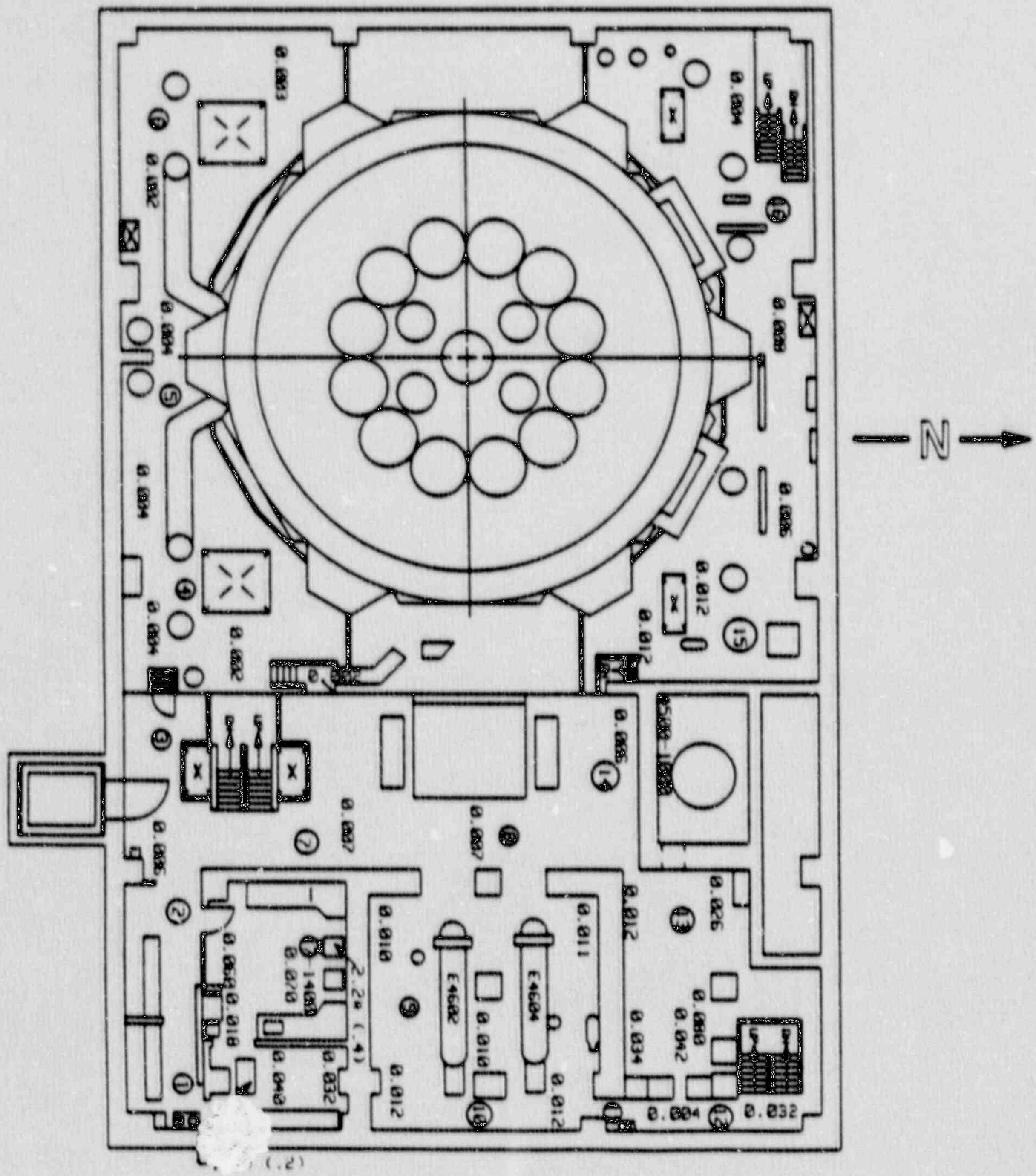
LEGEND: All Radiation levels in mrem/hr
* Denotes contact radiation reading
( ) denotes radiation level an 18 inches
Circled numbers indicate loose surface contamination survey point (all values <100 DPM/100 cm^2 unless a value is adjacent to the circle)

Figure 3.1-8 Reactor Building Radiation Survey - Level 1 (Elev. 4740')



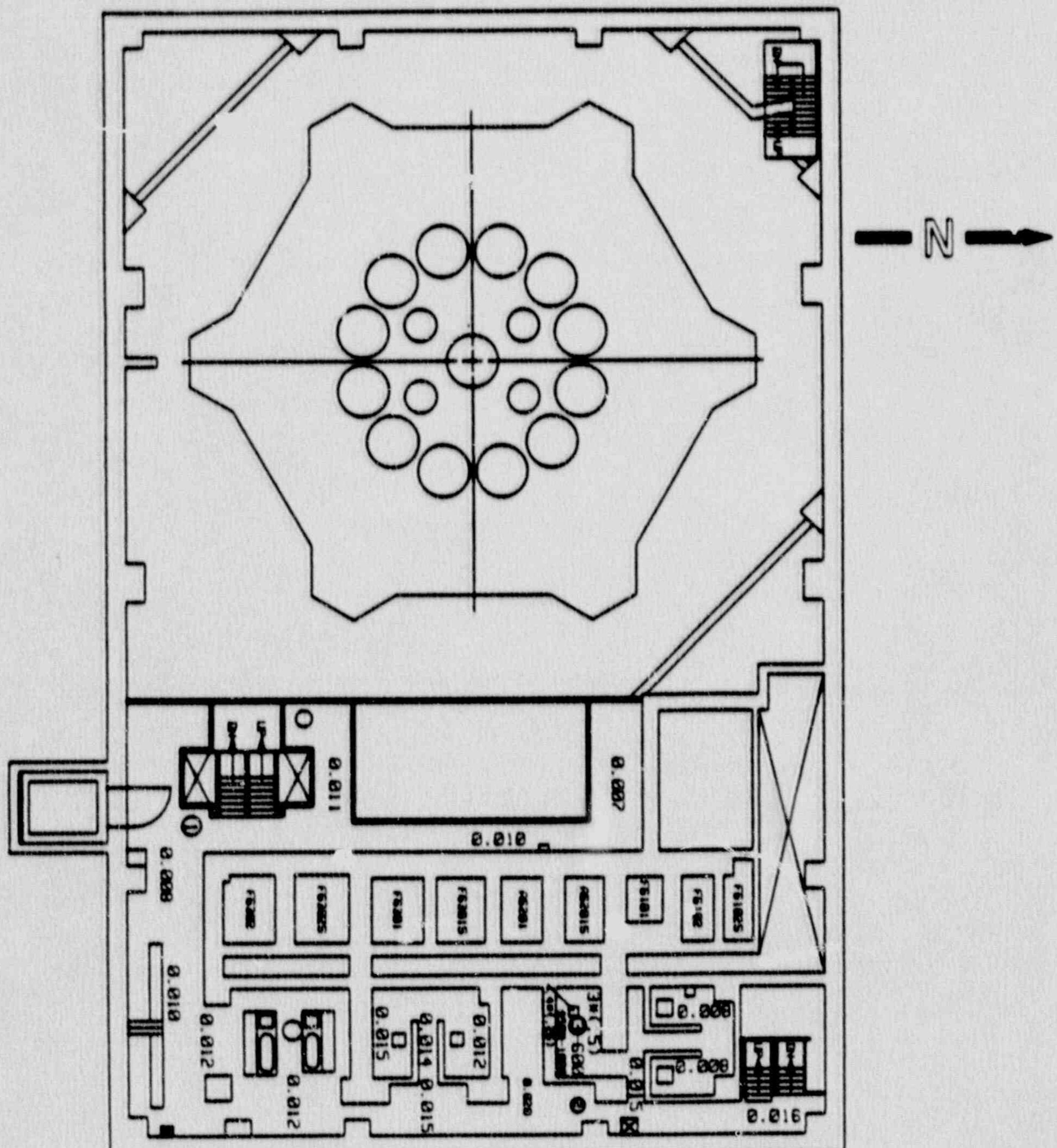
LEGEND: All Radiation levels in mrem/hr
* Denotes contact radiation reading
( ) denotes radiation level an 18 inches
Circled numbers indicate loose surface contamination survey point (all values <100 DPM/100 cm^2 unless a value is adjacent to the circle)

Figure 3.1-9 Reactor Building Radiation Survey - Level 2 (Elev. 4756')



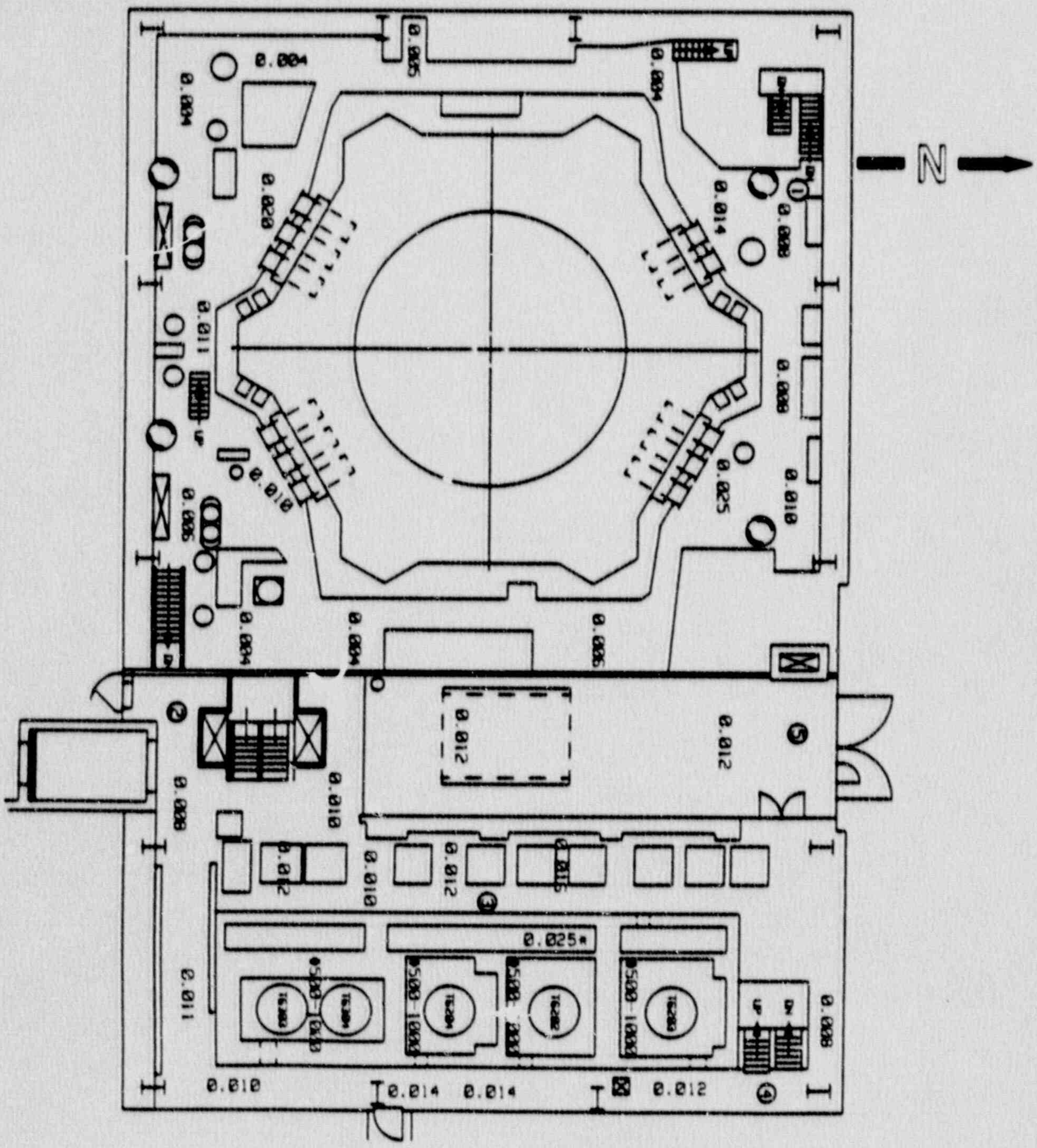
LEGEND: All Radiation levels in mrem/hr
* Denotes contact radiation reading
( ) denotes radiation level an 18 inches
Circled numbers indicate loose surface contamination survey point (all values <100 DPM/100 cm^2 unless a value is adjacent to the circle)

Figure 3.1-10 Reactor Building Radiation Survey - Level 3 (Elev. 4771')



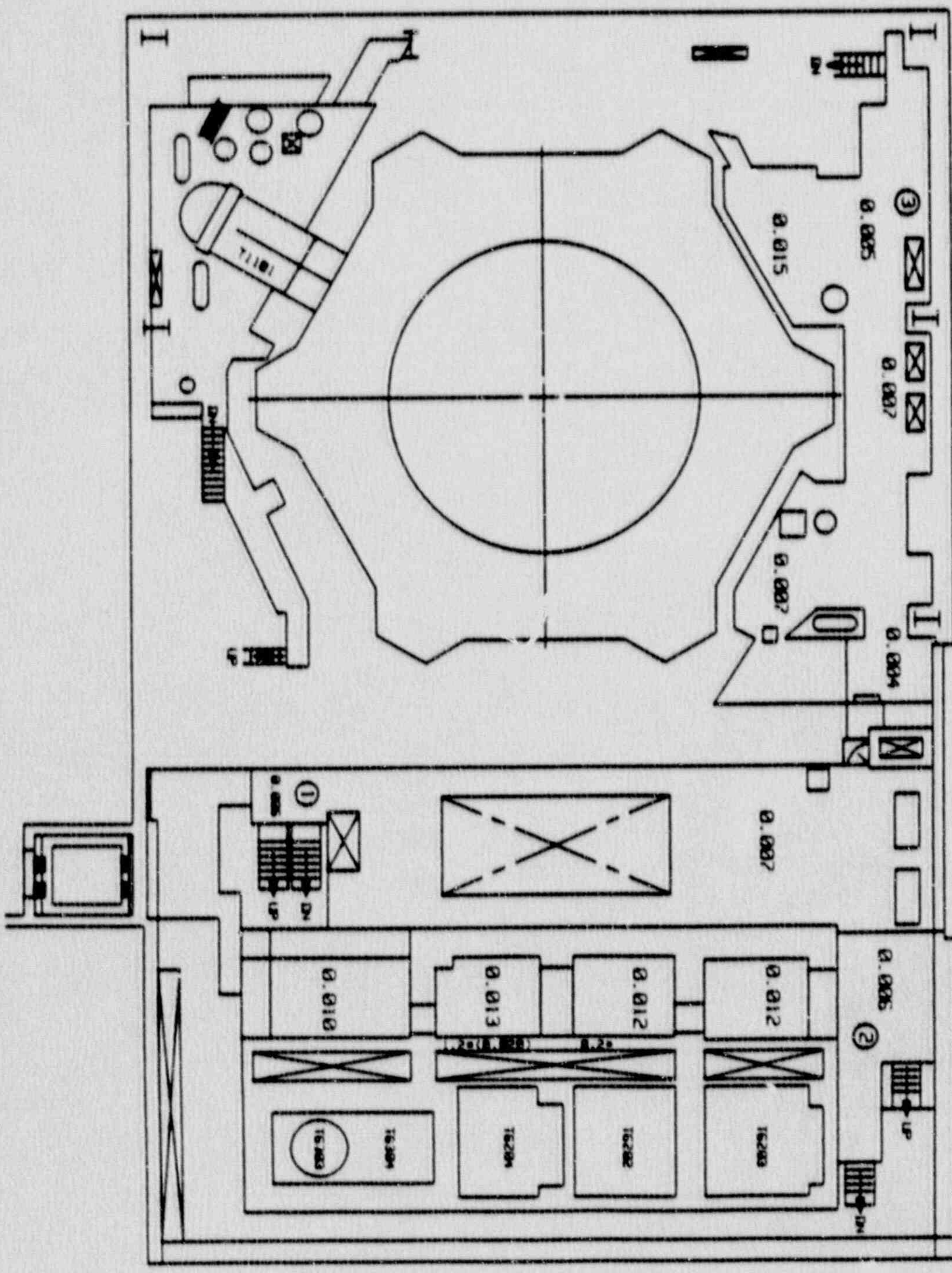
LEGEND: All Radiation levels in mrem/hr
* Denotes contact radiation reading
( ) denotes radiation level an 18 inches
Circled numbers indicate loose surface contamination survey point (all values <100 DPM/100 cm^2 unless a value is adjacent to the circle)

Figure 3.1-11 Reactor Building Radiation Survey - Level 4 (Elev. 4781')



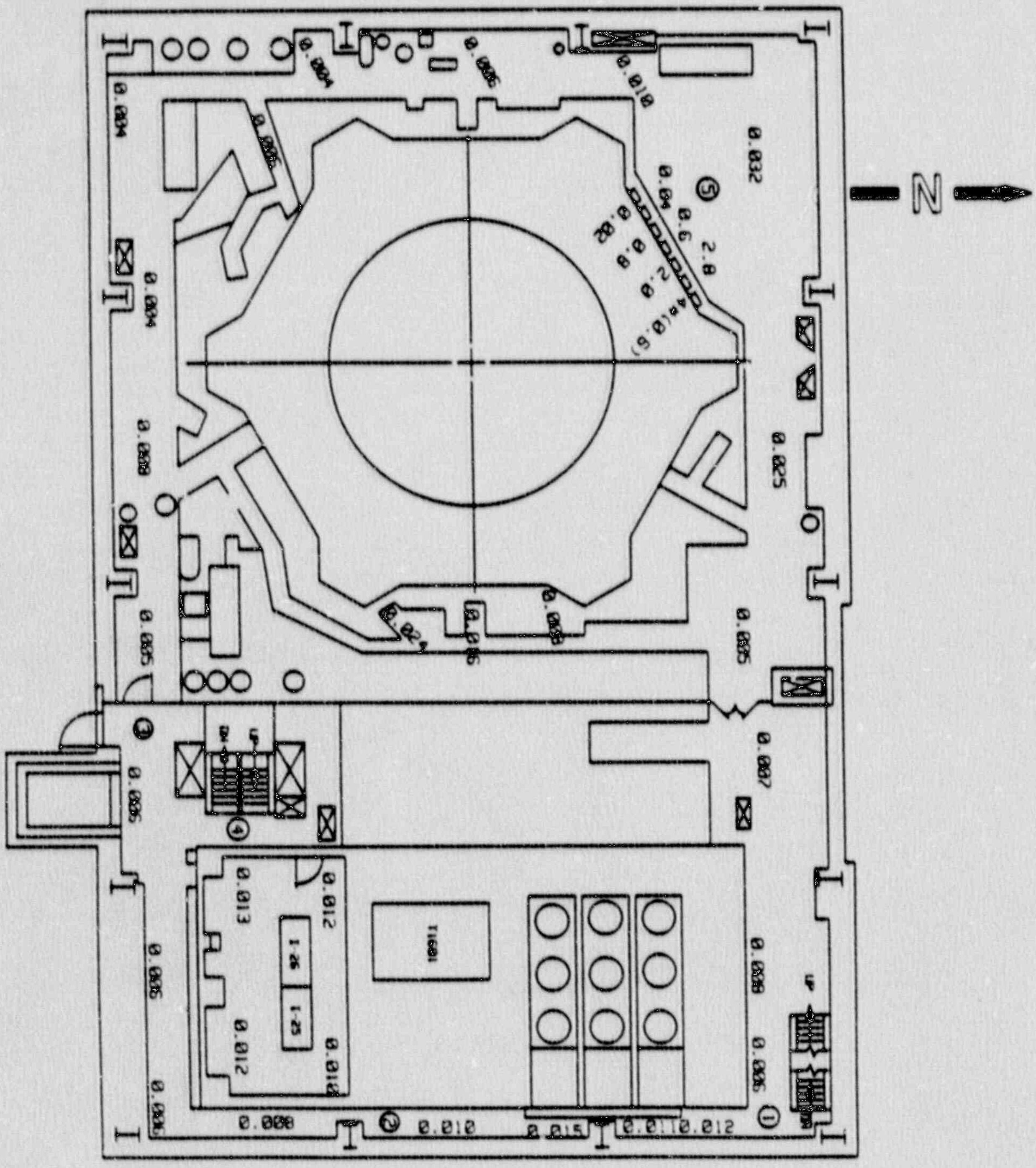
LEGEND: All Radiation levels in mrem/hr
* Denotes contact radiation reading
( ) denotes radiation level an 18 inches
Circled numbers indicate loose surface contamination survey point (all values <100 DPM/100 cm^2 unless a value is adjacent to the circle)

Figure 3.1-12 Reactor Building Radiation Survey - Level 5 (Elev. 4791')



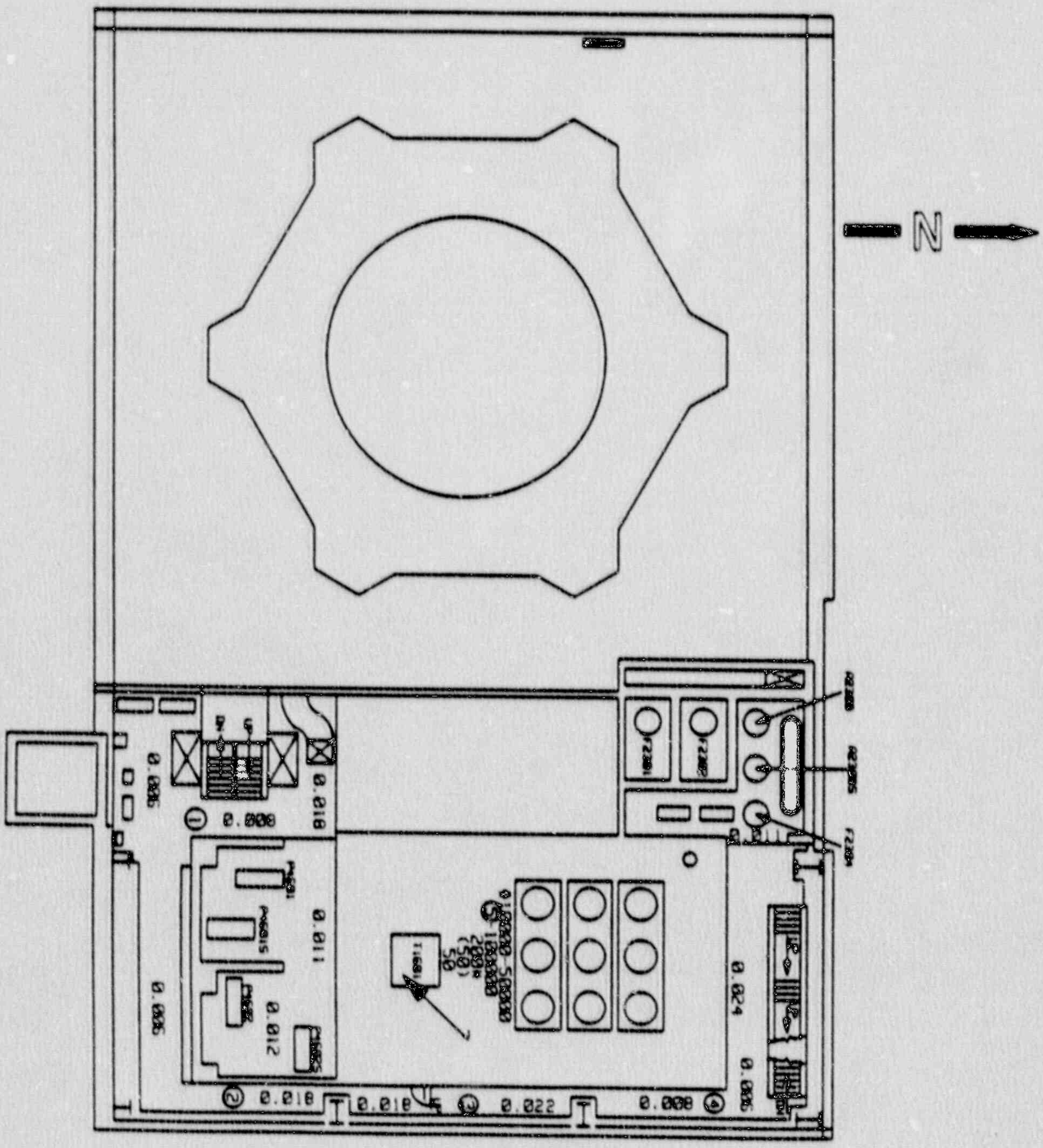
LEGEND: All Radiation levels in mrem/hr
* Denotes contact radiation reading
( ) denotes radiation level an 18 inches
Circled numbers indicate loose surface contamination survey point (all values <100 DPM/100 cm^2 unless a value is adjacent to the circle)

Figure 3.1-13 Reactor Building Radiation Survey - Level 6 (Elev. 4816')



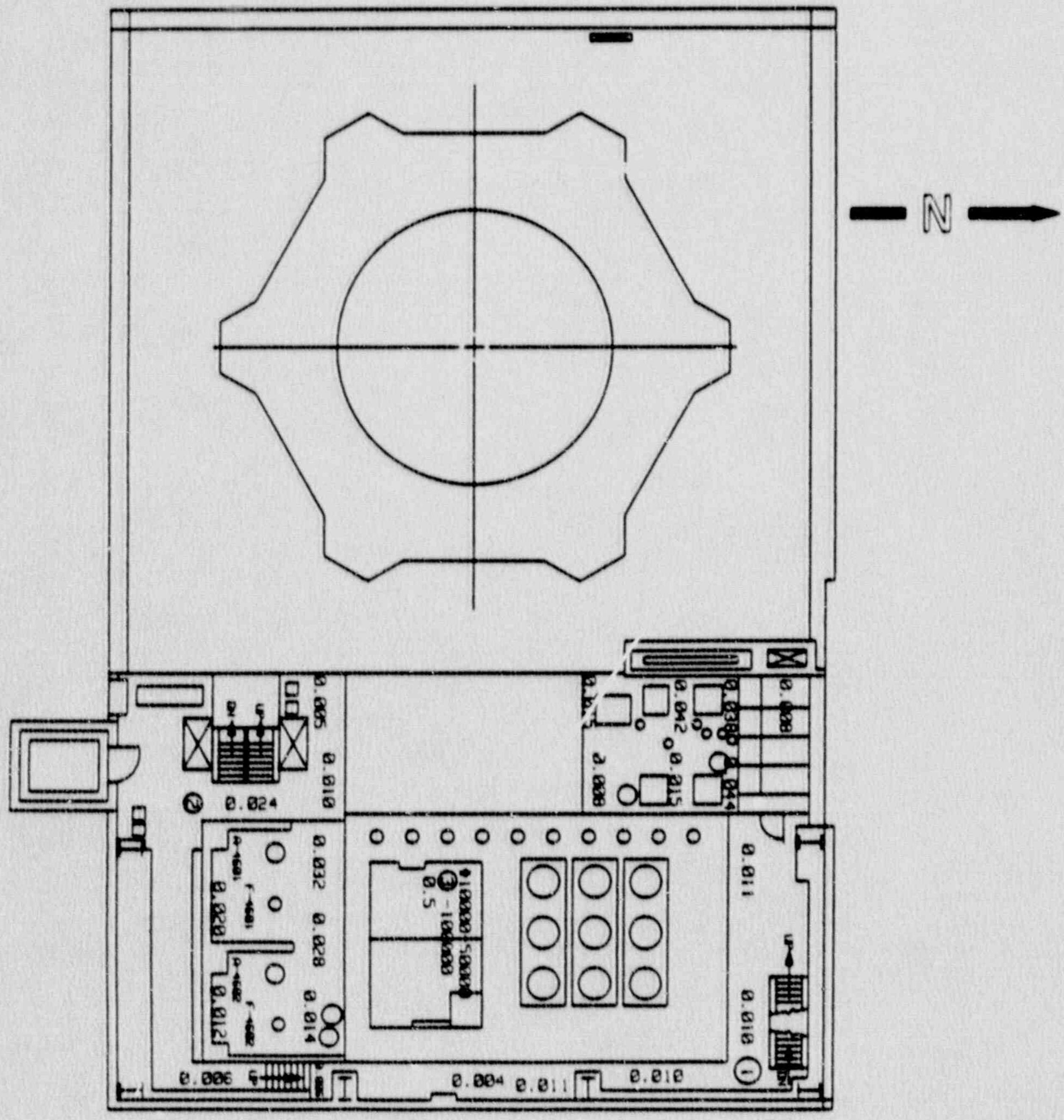
LEGEND: All Radiation levels in mrem/hr
* Denotes contact radiation reading
( ) denotes radiation level an 18 inches
Circled numbers indicate loose surface contamination survey point (all values <100 DPM/100 cm^2 unless a value is adjacent to the circle)

Figure 3.1-14 Reactor Building Radiation Survey - Level 7 (Elev. 4829')



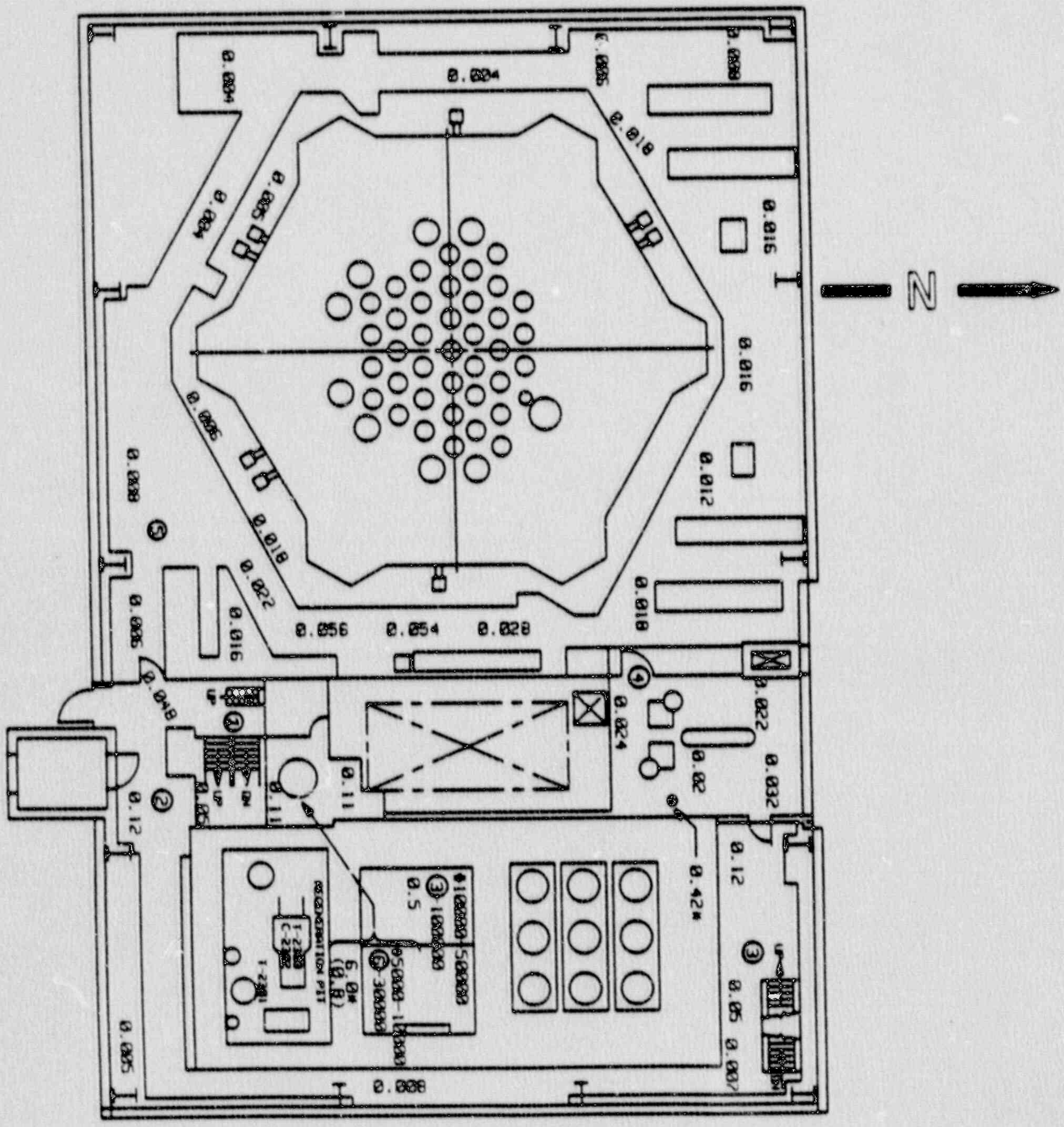
LEGEND: All Radiation levels in mrem/hr
* Denotes contact radiation reading
( ) denotes radiation level an 18 inches
Circled numbers indicate loose surface contamination survey point (all values <100 DPM/100 cm^2 unless a value is adjacent to the circle)

Figure 3.1-15 Reactor Building Radiation Survey - Level 8 (Elev. 4859')



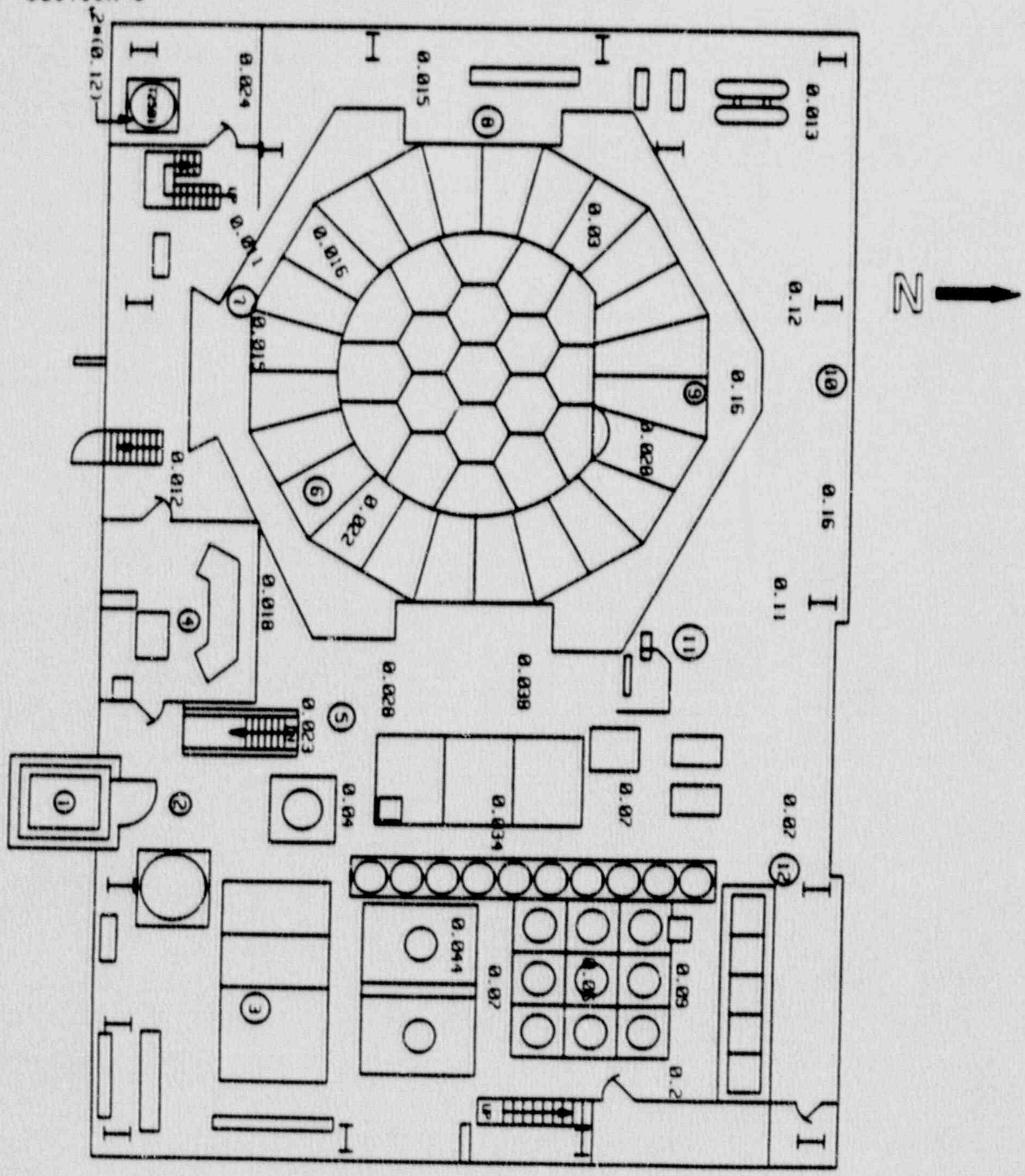
LEGEND: All Rad on levels in mrem/hr
* Deno.. contact radiation reading
( ) denotes radiation level an 18 inches
Circled numbers indicate loose surface contamination survey point (all values <100 DPM/100 cm^2 unless a value is adjacent to the circle)

Figure 3.1-16 Reactor Building Radiation Survey - Level 9 (Elev. 4849')



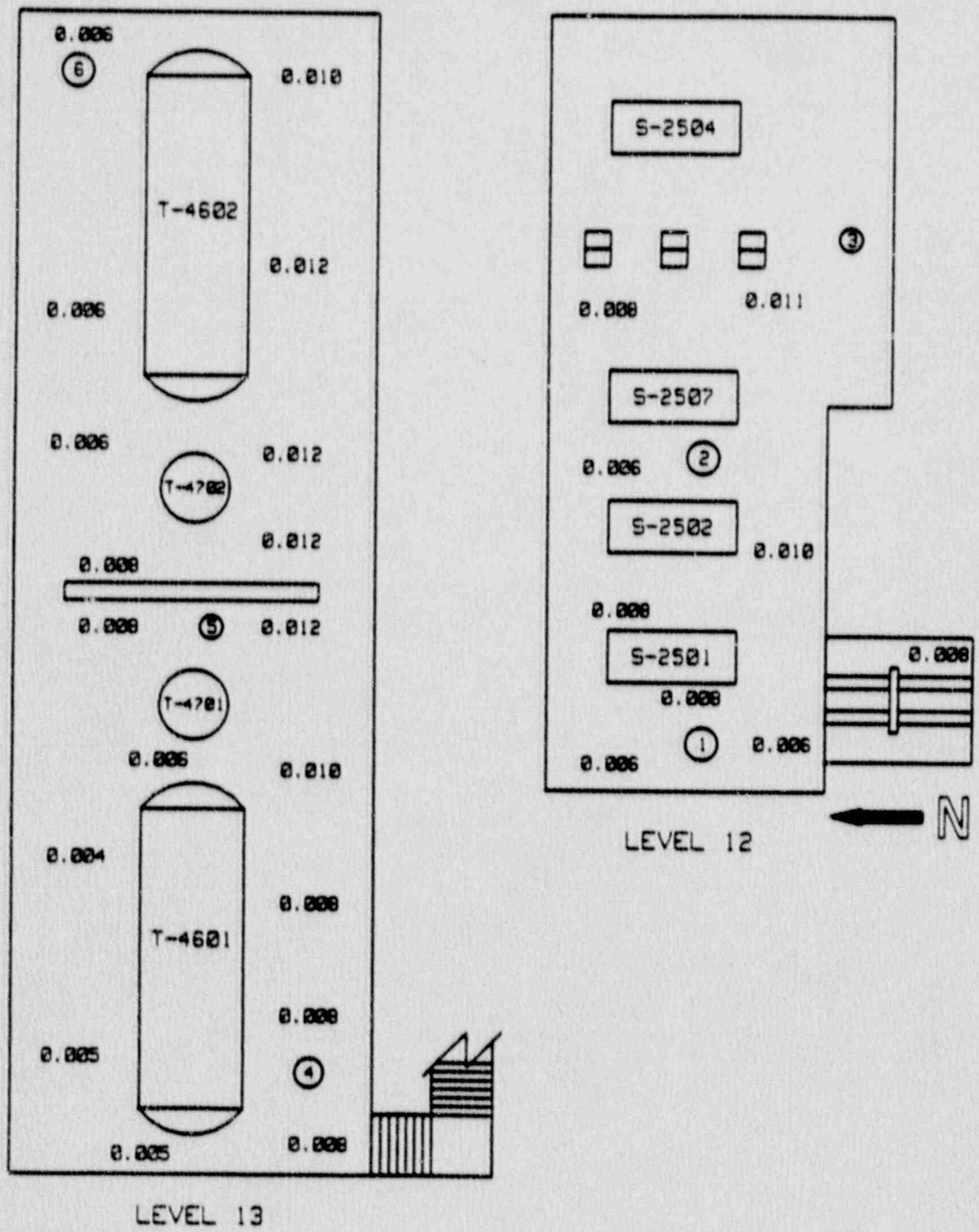
LEGEND: All Radiation levels in mrem/hr
* Denotes contact radiation reading
( ) denotes radiation level an 18 nches
Circled numbers indicate loose surface contamination survey point (all values <100 DPM/100 cm^2 unless a value is adjacent to the circle)

Figure 3.1-17 Reactor Building Radiation Survey - Level 10 (Elev. 4864')



LEGEND: All Radiation levels in mrem/hr
* Denotes contact radiation reading
( ) denotes radiation level an 18 inches
Circled numbers indicate loose surface contamination survey point (all values <100 DPM/100 cm^2 unless a value is adjacent to the circle)

Figure 3.1-18 Reactor Building Radiation Survey - Level 11 (Elev. 4881') Refueling Floor



LEGEND: All Radiation levels in mrem/hr
* Denotes contact radiation reading
( ) denotes radiation level an 18 inches
Circled numbers indicate loose surface contamination survey point (all values <100 DPM/100 cm^2 unless a value is adjacent to the circle)

Figure 3.1-19 Reactor Building Radiation Survey - Levels 10 & 11 (Elev. 4864' & 4881')

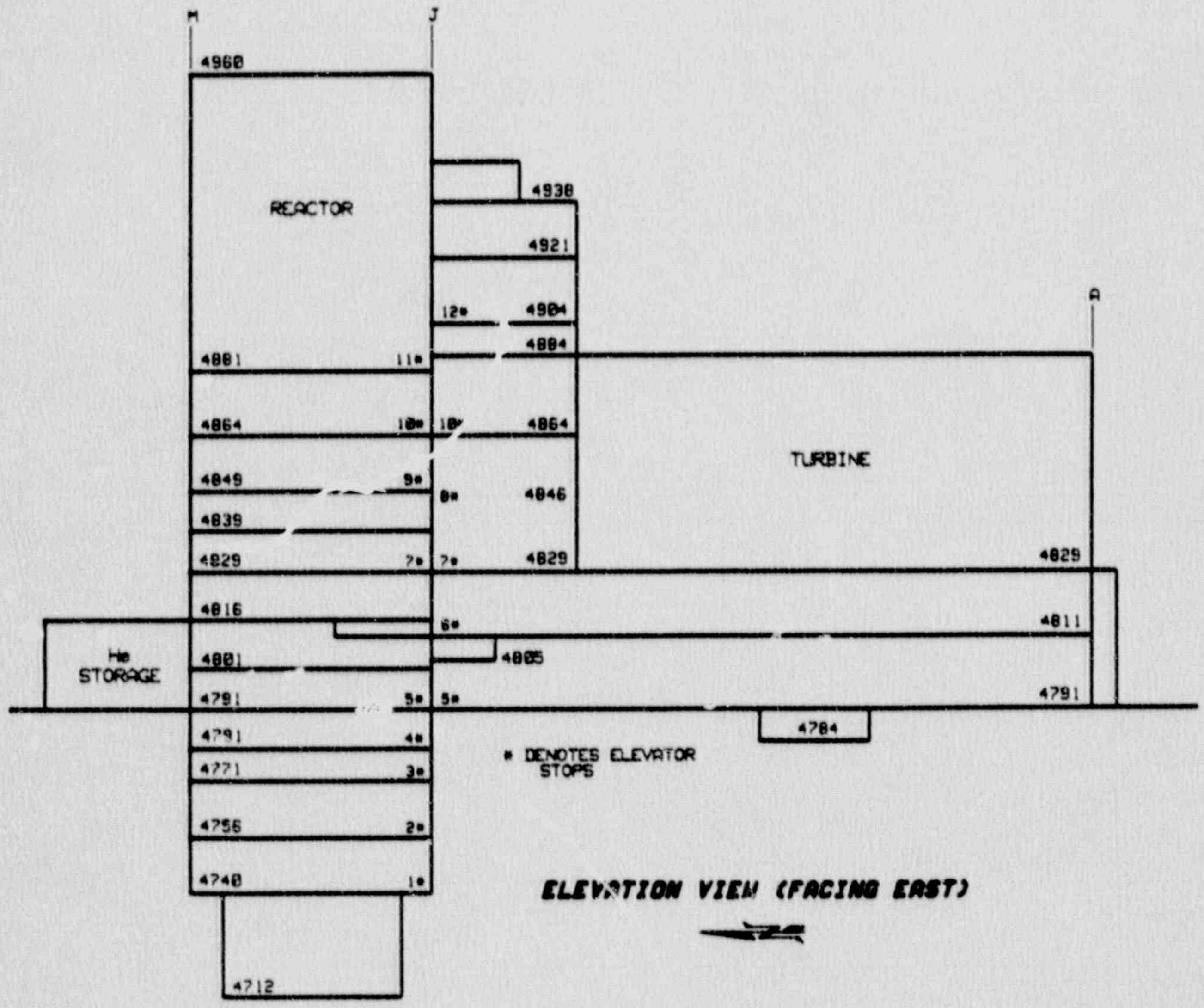


Figure 3.1-20 Turbine and Reactor Building Elevations

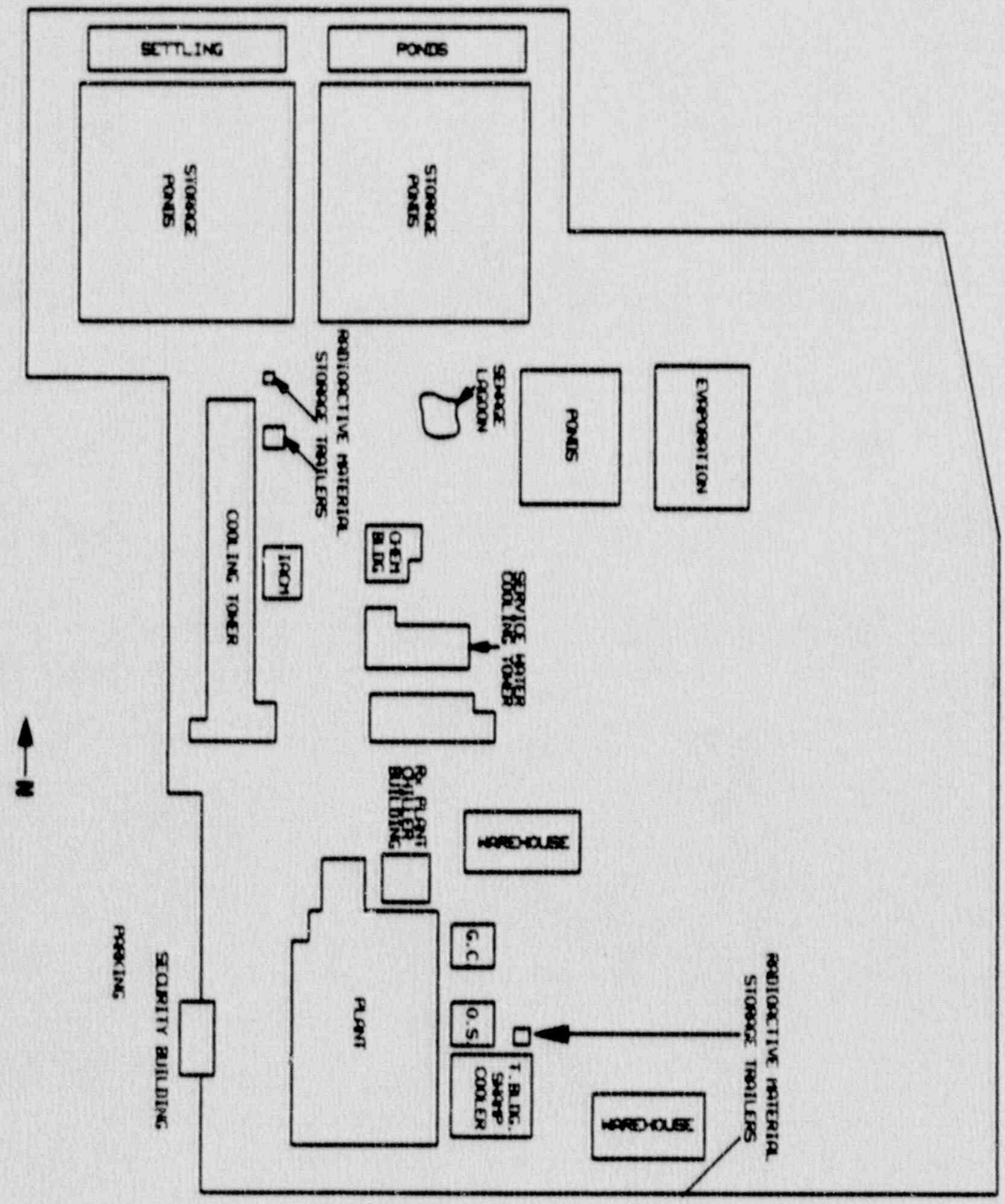


Figure 3.1-21 Location of Sit(Trailers

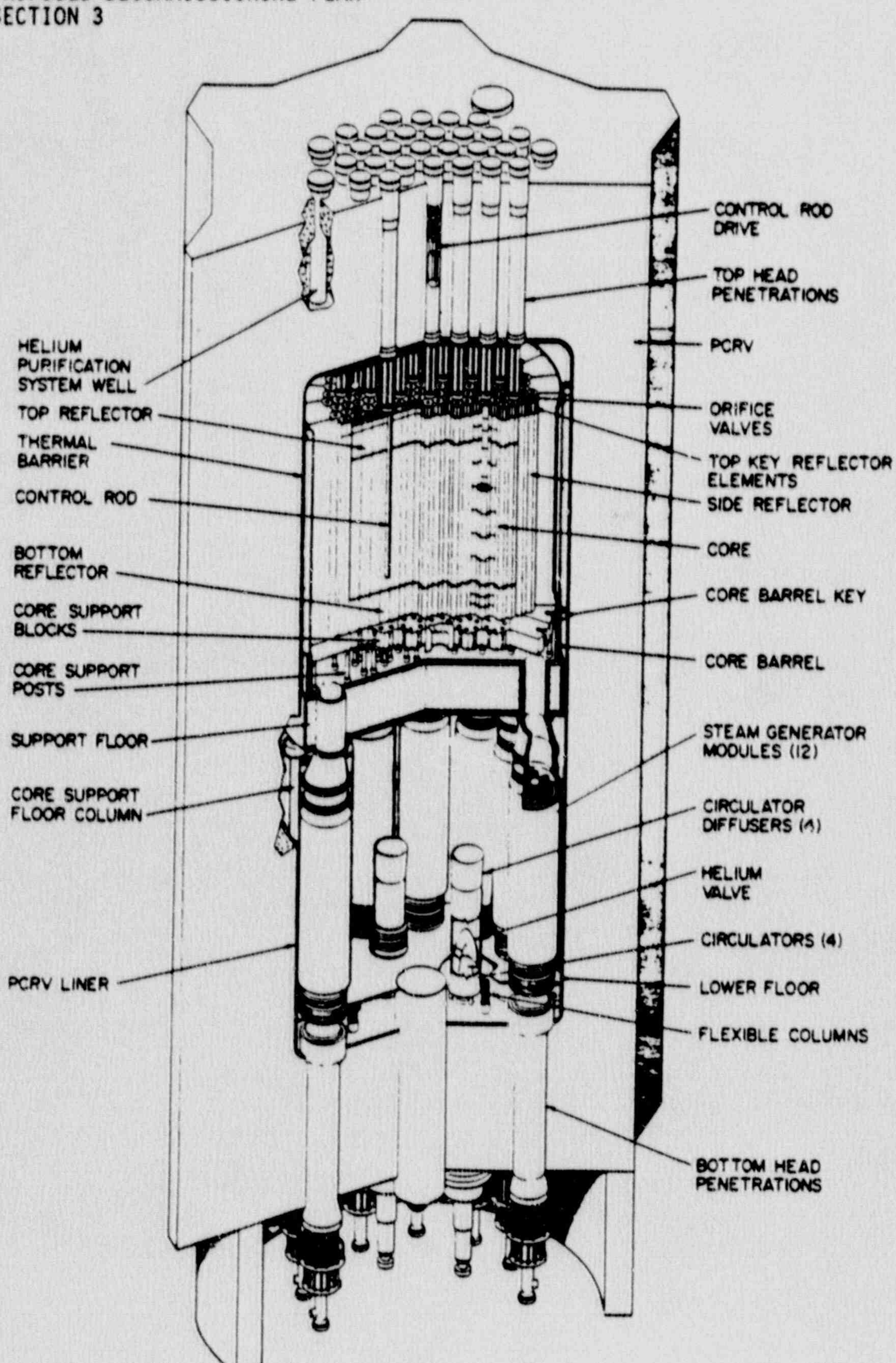


Figure 3.1-22 PCRV and Internal Components

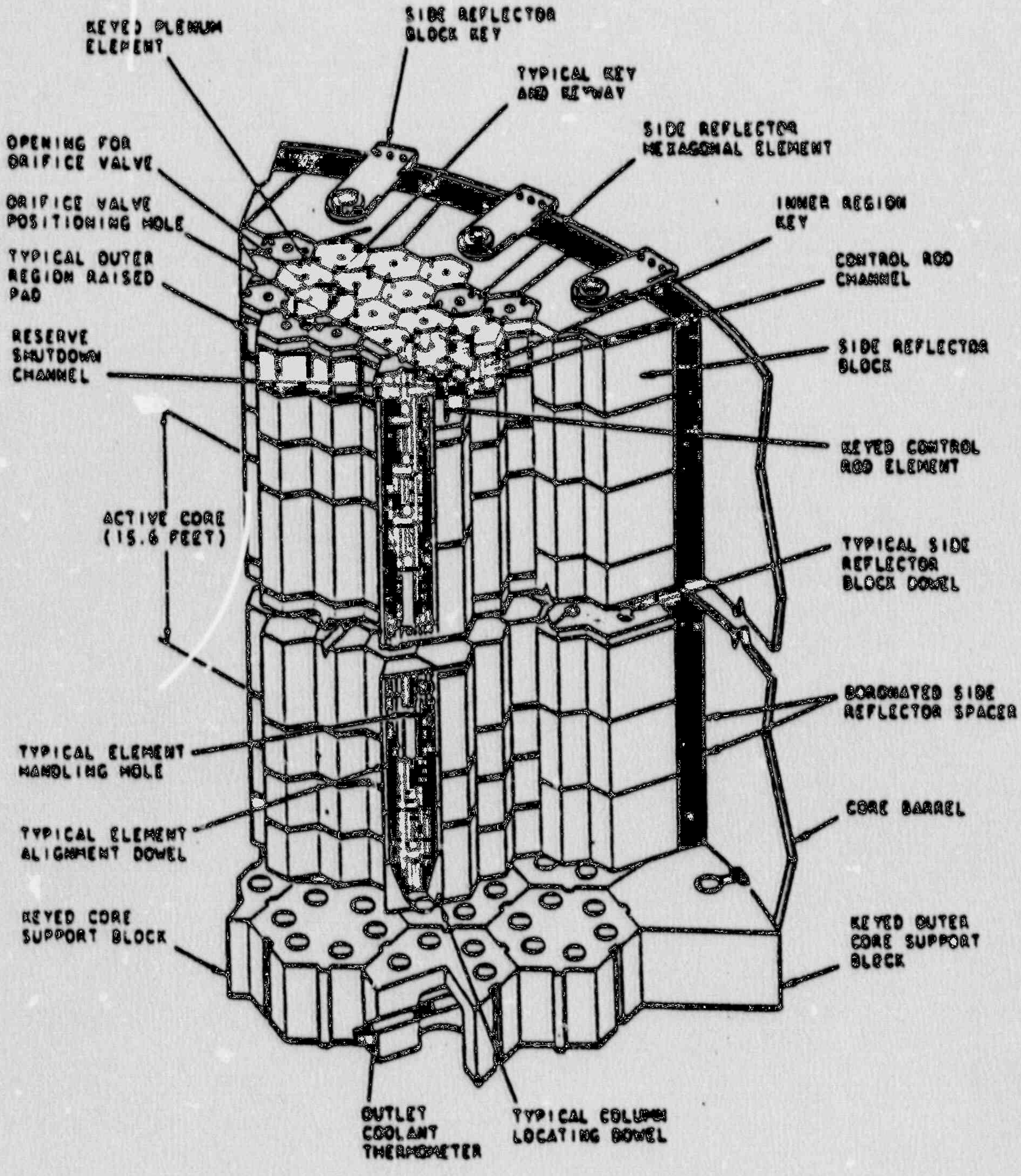
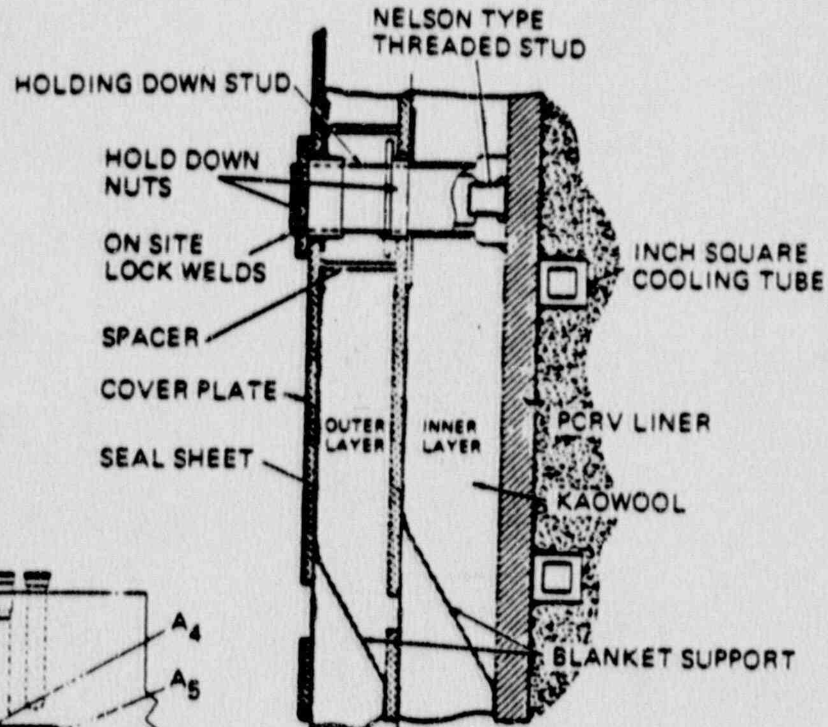
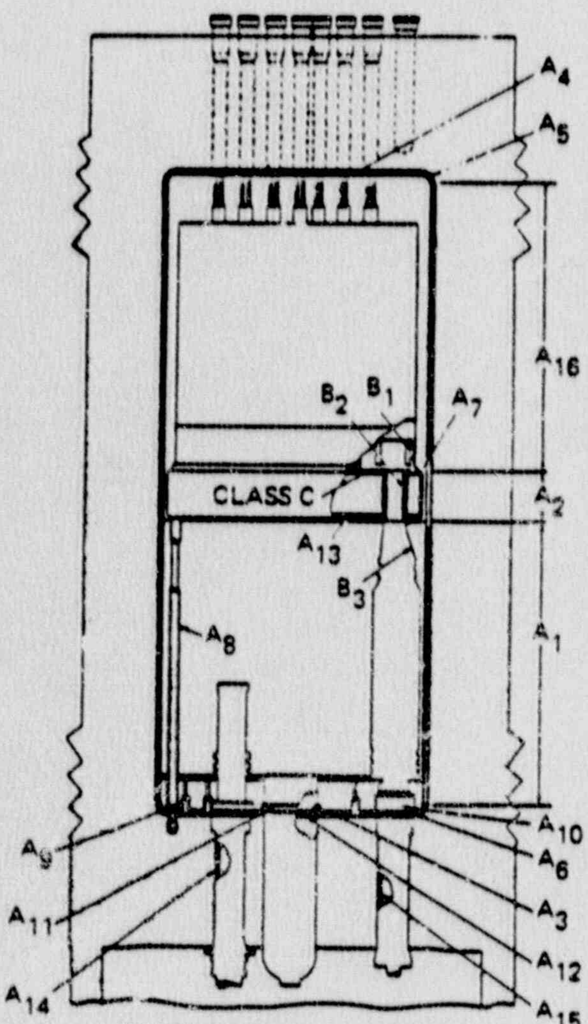


Figure 3.1-23 Core Arrangement



TYPICAL SECTION THRU INSULATION
IN AREA A_1



CROSS SECTION REACTOR
SHOWING LOCATION OF
THERMAL BARRIER AREAS

AREA	OVERALL THICKNESS TO TOP OF COVER PLATE	INSULATION MATERIAL THICKNESS AS INSTALLED	
		INNER	OUTER
CLASS A			
A_1	4-9/16 IN.	2-1/4 IN.	1-3/4 IN
A_2	3-13/16 IN.	2-1/4 IN.	1 IN
A_3	3-9/32 IN.	3 IN.	NONE
A_4	4-9/16 IN	2-1/4 IN.	1-3/4 IN
$A_{5\&6}$	≥ 4-9/16 IN.	≥ 2-1/4 IN	≥ 1-3/4 IN
A_7	3-3/16 IN.	1-3/4 IN.	1 IN
$A_{8\&9}$	1-5/32 IN	1 IN	NONE
A_{10}	2-9/32 IN	2 IN	NONE
A_{11}	3-5/32 IN	3 IN	NONE
A_{12}	3-9/32 IN.	3 IN	NONE
A_{13}	4-9/16 IN.	2-1/4 IN	1-3/4 IN.
A_{14}	1-5/32 IN	1 IN.	NONE
A_{15}	2 IN	METALLIC	INSULATION
A_{16}	3-13/16 IN	2-1/4 IN	1 IN
CLASS B			
B_1	3-1/2 IN	3-1/4 IN	NONE
B_2	3 IN	1-1/8 IN	1-1/8 IN
B_3	2-1/4 IN	1-3/4 IN	NONE
CLASS C			
C	12 IN	2-3/4 IN	9 IN

Figure 3.1-24 Class A Insulation and PCRV Liner

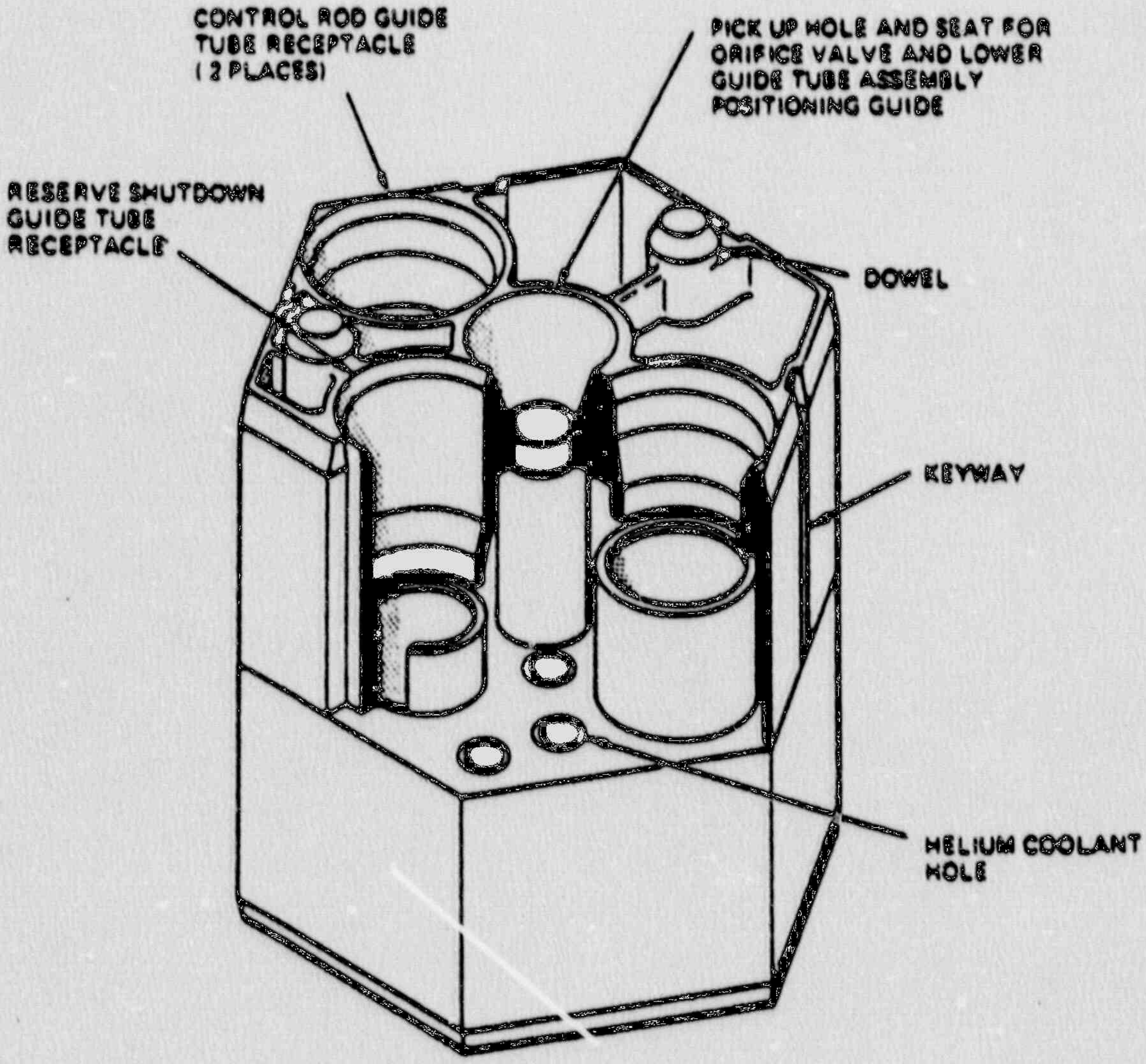


Figure 3.1-25 Central Column Metal Clad Reflector

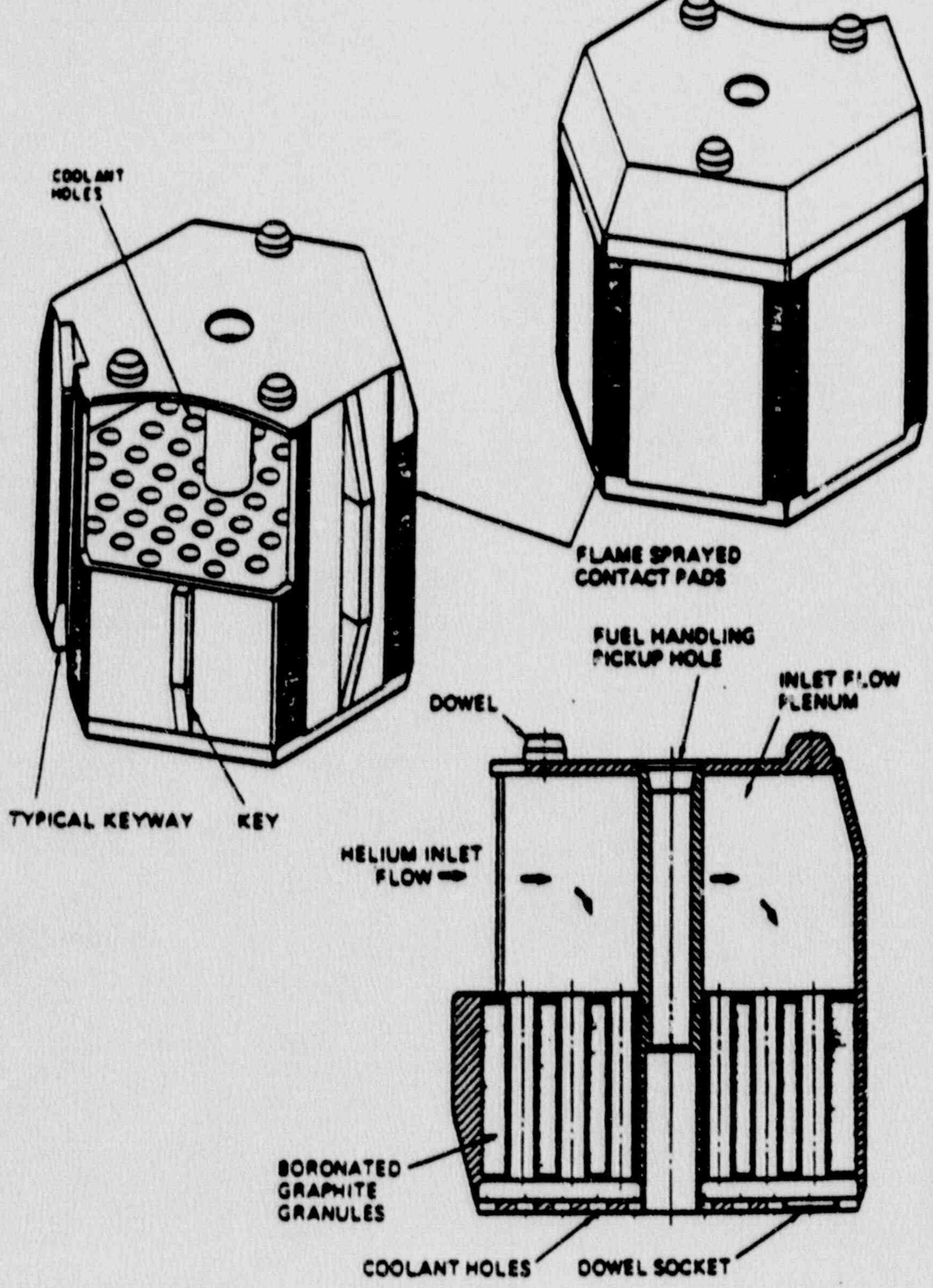


Figure 3.1-26 Side Column Metal Clad Reflector

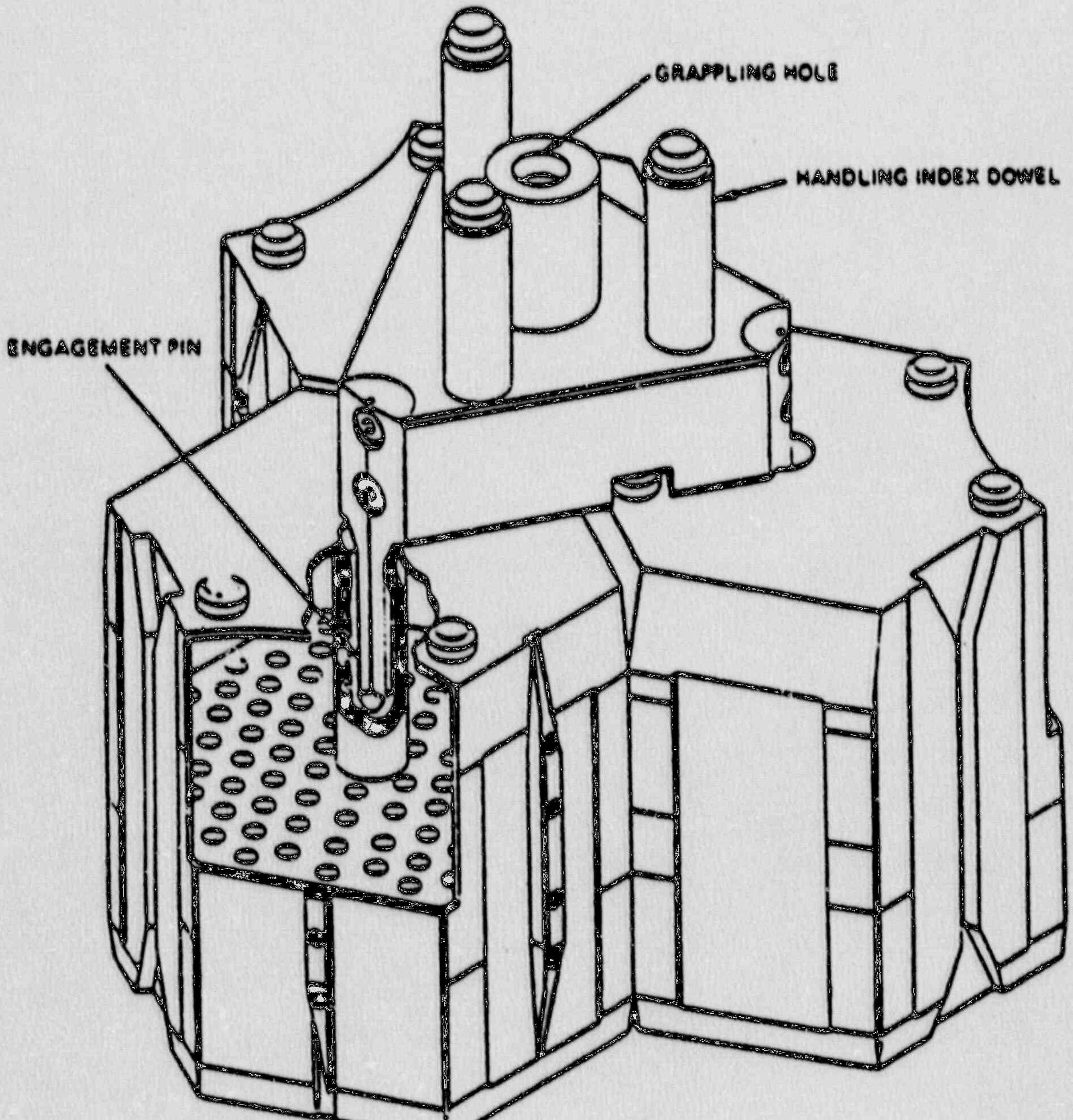


Figure 3.1-27 Region Constraint Devices (RCDs)

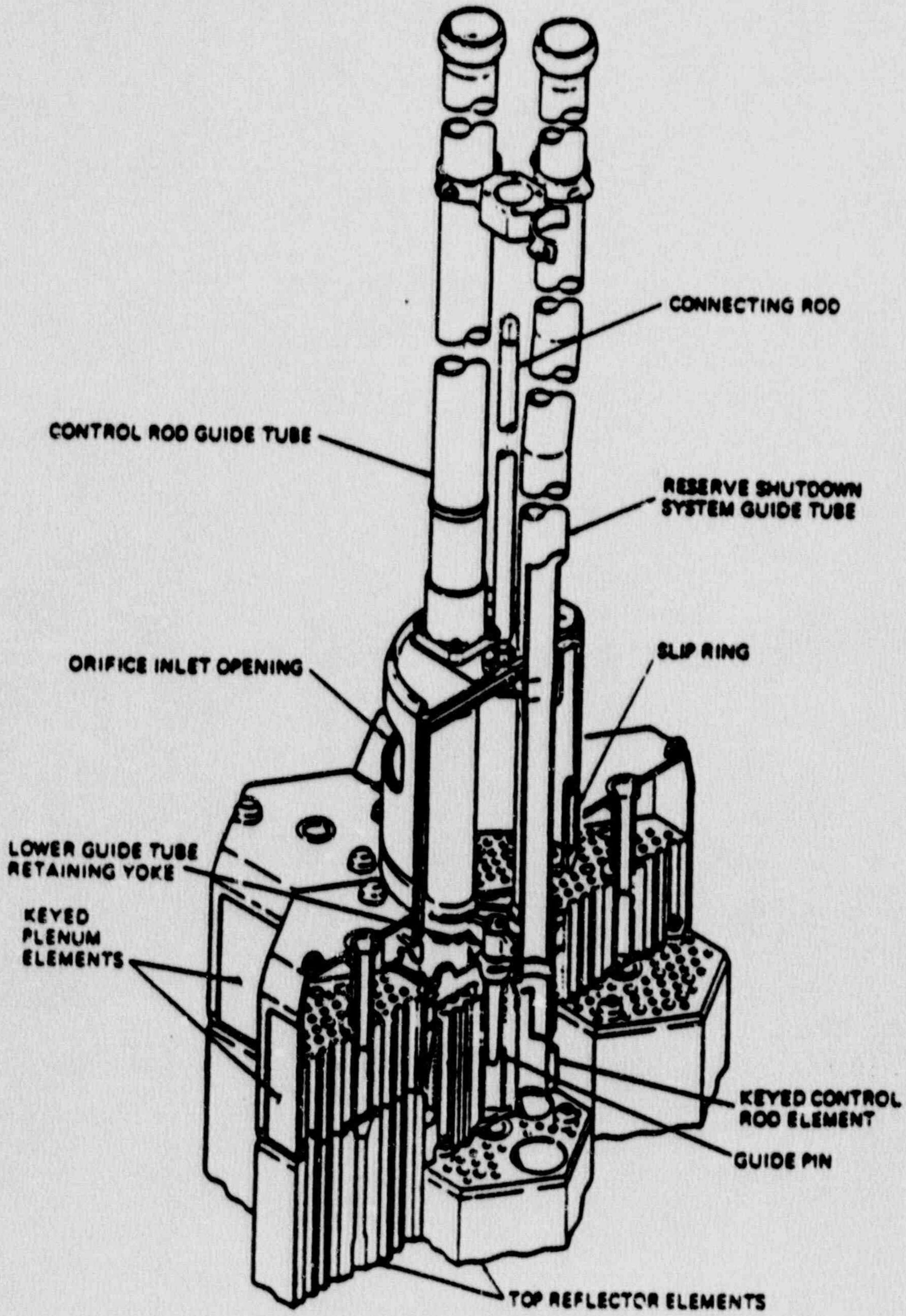


Figure 3.1-28 Lower Orifice Valve Assembly

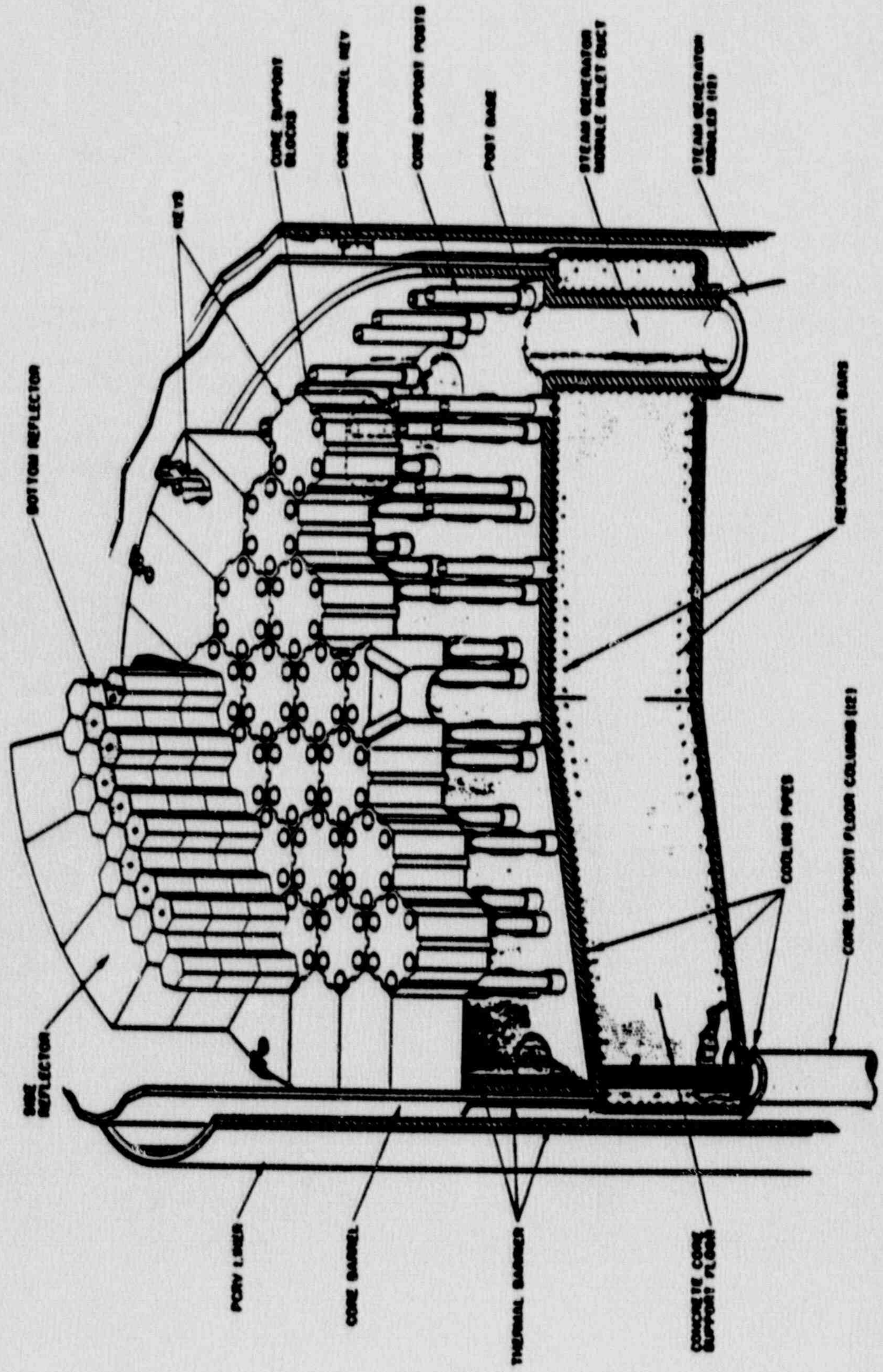
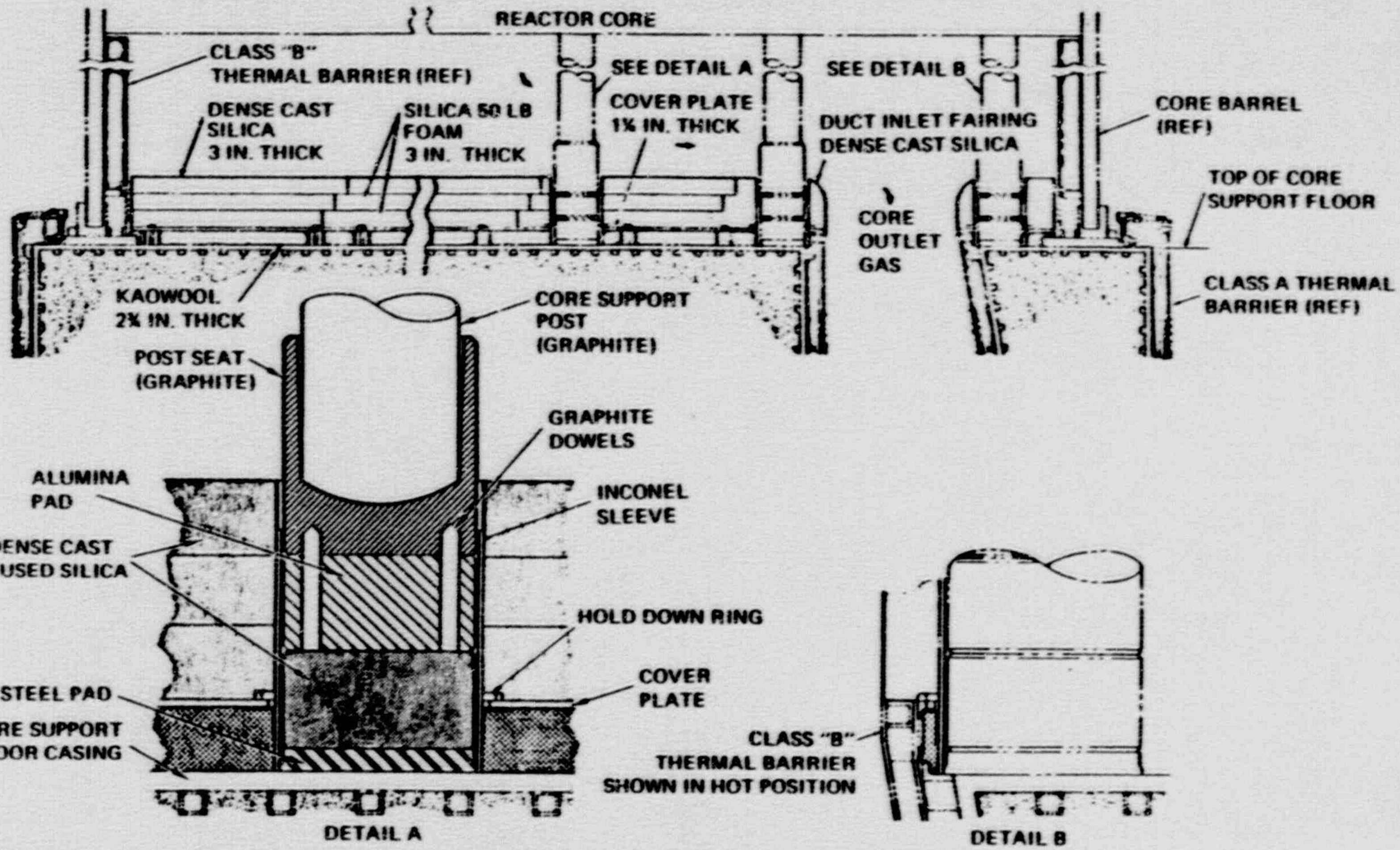


Figure 3.1-29 Core Support Arrangement



CLASS "C" THERMAL BARRIER ARRANGEMENT

Figure 3.1-30 Class C Insulation

3.2 RADIATION PROTECTION PROGRAM

3.2.1 Introduction

The primary objective of the Fort St. Vrain radiation protection program is to protect workers, visitors and the general public from unwarranted exposure to radiation or to radioactive materials during the decommissioning of Fort St. Vrain. In order to meet this objective, efforts will be made to reduce and maintain personnel exposures and radioactive effluents to levels that are ALARA.

To accomplish this objective, project management will be responsible for the following activities:

1. Ensure that each supervisor implements their responsibility to integrate appropriate radiation protection controls into all work activities.
2. Maintain a comprehensive radiation protection program by providing sufficient staff, facilities and equipment.
3. Ensure the indoctrination and training of all radiation workers in procedures and practices applicable to their work, to assure that each individual understands and accepts the responsibility to follow all procedures, maintains individual radiation exposures ALARA, and minimizes the generation of radwaste during work activities.
4. Implement a program for minimizing the generation of radioactive wastes (radwaste).

The radiation protection organization will be responsible for the following activities:

1. Perform a thorough radiological hazards evaluation of work involving personnel radiation exposure or the handling of radioactive materials.
2. Develop any procedures which may be necessary to implement the requirements of this document.
3. Provide appropriate surveillances to verify a radiologically safe working environment.
4. Control the movement and storage of radioactive materials which are used or produced during decommissioning activities.
5. Health physics and other project supervisory personnel will thoroughly evaluate undesired occurrences related to radiation protection and will formulate methods to preclude their recurrence.

3.2.1.1 Responsibilities

Responsibility for implementation of the project radiation protection and ALARA programs reside with the PSC Program Manager for Decommissioning and the Westinghouse team Project Director.

A PSC Radiation Protection Manager will be designated, will report to the Facility Support Manager, and will be responsible for the control and maintenance of the radiation protection program. A Westinghouse team Radiation Protection Manager will also be designated. This individual will administratively report to the Technical Services Manager, but will implement the radiation protection program as directed by the PSC Radiation Protection Manager. Responsibilities of these individuals will include:

1. Coordination of all revisions to the radiation protection program.
2. Coordination of a two year review of the manual to ensure its continued applicability and accuracy.

3.2.1.2 Management Oversight

Measures will be implemented to provide oversight to ensure that the radiation protection program functions effectively. These measures are designed to assure radiation protection goals are met and the policies outlined in this manual are properly implemented. Management oversight operates at several levels from first line supervisors through the Program Manager/Project Director via several mechanisms, including the following:

1. Personnel management practices to assure that individual personnel are qualified for their assigned responsibilities and their job performance is monitored.
2. Active management involvement in review and approval of radiation protection program performance goals and results.
3. A formal program to identify, report, evaluate and provide corrective actions to problems and deficiencies.
4. Emphasis on management tours and review of operations and practices.
5. Comprehensive QA and audit systems.
6. Tracking of program improvement action items and commitments to ensure that they are completed in a timely fashion and with proper documentation.
7. Establishment, monitoring and reporting of performance indicators for radiation protection.

3.2.1.3 Review and Approval of Performance Goals and Results

Management review of radiation protection performance is provided by management involvement in the Decommissioning Safety Review Committee. This committee will review program status, dose projections, performance indicators and proposed goals. Further definition of this committee, membership and responsibilities is contained in Section 2.4.9.

3.2.2 Exposure Control

3.2.2.1 Personnel Exposure

1. External Whole Body Monitoring

External radiation monitoring will be accomplished through the use of personal dosimetry, including thermoluminescent dosimeters (TLDs) and self-reading pocket dosimeters (SRDs). The official record of accumulative external dose received by individuals will be obtained from the TLDs. The SRDs will be used as a back-up to the TLD and provide a means for tracking exposure between TLD processing periods.

Dose information from sources other than the TLD may replace or supplement TLD results as described in radiation protection procedures. Such action may be necessary if the TLD result is unavailable due to loss or damage, or if the TLD result is suspect. In these cases, the action taken and the justification for such actions will be documented as required by radiation protection procedures.

2. Special Monitoring

Extremity monitoring devices will be issued whenever workers meet the criteria specified in 10 CFR 20.202. Specific criteria to determine the need for extremity monitoring and for determining the extremity dose will be identified in radiation protection procedures. Extremity monitoring will be accomplished using TLDs or equivalent.

Monitoring of the skin dose is normally accomplished with the whole body TLD. Instructions will be provided in radiation protection procedures and on Radiation Work Permits (RWPs) as to requirements and the proper method for wearing the TLD to properly measure skin doses. Guidance will also be given in procedures and specified on RWPs for the use of protective clothing to reduce skin exposure.

Where it is suspected that the whole body TLD does not provide a proper measure of the skin dose, calculations or additional TLDs worn at the area of localized exposure will be used to determine the dose. The dose due to skin contamination will be calculated using industry accepted computational models.

Whole body badging with multiple dosimeters will be required when work is performed in a non-uniform radiation field and the portion of the body which will receive the highest exposure is not easily determined. RWP instructions and job briefings will be used to communicate the requirements to the workers.

3. Internal Exposures

Internal radiation exposure control is accomplished by establishing exposure limits and administrative exposure controls, by monitoring workers for internal radioactivity, by identifying and controlling sources or potential sources of airborne radioactivity, and by the use of engineered controls. Identifying and controlling sources is discussed in the Section 3.2.2.3, and the use of engineered controls is discussed in Section 3.2.3 (ALARA) and 3.2.5 (Respiratory Protection).

The bioassay program performs as a quality control check on the success of the radiation protection and respiratory protection programs in preventing internal radioactive contamination of workers. Bioassay examinations will include whole body counting (in vivo) and radiobioassay of excreta (in vitro), when necessary. The bioassay program will also be used as an aid in determining the extent of an individual's exposure to airborne concentrations of radioactive material.

Radiation protection procedures for bioassay include the development of detailed criteria for the performance of bioassay, as well as methods for data analysis and interpretation. The methods and techniques prescribed by these procedures follow the guidance found in NRC Regulatory Guides 8.9, 8.20 and 8.26.

3.a Whole Body Counting

Whole body counting is the measurement of the radiation from the body using an external detector. It is used to determine the identity and quantity of gamma emitting isotopes in the body at any given time. All decommissioning project workers who are issued TLD dosimetry will receive a baseline count, an annual count, and periodic counts based on exposure to airborne contamination.

Evaluations after suspected intakes will be performed as required by radiation protection procedures.

3.b Indirect Bioassay

To aid in determining intakes, indirect bioassay (in vitro) measurements may be made. By measuring the quantity of radioactivity in urine or fecal samples at specific times, an individuals intake and internal dose can be estimated. This method of bioassay is typically used when the intake cannot be determined by whole body counting or when additional information on an intake is required. In vitro measurements will be made when specified by radiation protection procedures.

3.2.2.2 Dosimetry Program

The dosimetry program involves both the monitoring and regulation of radiation exposure. Personnel monitoring devices will be required for all personnel meeting the conditions specified in 10 CFR 20.202. Administrative dose control limits will be used to ensure that individuals do not exceed the exposure limits specified in 10 CFR 20.101 and 10 CFR 20.103. The administrative limits will also used as a management tool to ensure that individual and collective doses are maintained ALARA. Administrative dose control levels will be established in such a manner that increasing levels of exposure require increasing levels of management approval.

3.2.2.3 Radiological Surveys

Radiological surveys are performed to meet the requirements of 10 CFR 20.201 and the following objectives:

1. Continuously assess the radiological environment at the project site.
2. Effectively specify controls to ensure personnel are made aware of radiological hazards.

Radiological surveys will be conducted to identify and measure external radiation, airborne radioactivity and surface contamination. Evaluations will be made for the various types of radiation (gamma, beta and alpha) that may be encountered at Fort St. Vrain.

Radiation protection procedures will specify the types of instrumentation and the methods to be employed when performing surveys and taking samples. Instrumentation will be available for

the detection and quantification of hot particle sources and the measurement of alpha, beta and gamma radiation. Sampling equipment will be available which allows the sampling of the air breathed by workers. Counting equipment will be available to measure alpha, beta and gamma emitting radionuclides.

The results of surveys will be documented on survey forms which will be made available to the workers who will be entering a radiological controlled areas. The survey form will contain, as applicable, a sketch or map of the area, contact and general area dose rates, contamination levels, identification of specific hazards such as hot spots, and the location of radiological boundaries.

A supervisory review will be performed on all surveys to ensure that the surveys are appropriate and that all information is properly recorded. The supervisor reviewing the survey will ensure that the results are consistent with those anticipated and determine the reason for any variance.

Survey frequencies will be based on the hazard that may be encountered, the potential for changing radiological conditions, and the frequency of occupation. Surveys will be performed to provide positive verification that radioactive materials are being adequately controlled and are not spreading to uncontrolled areas. Survey frequencies will be specified in radiation protection procedures.

3.2.2.4 Contamination Control

Contamination control is required in order to minimize the number and volume of contaminated areas, tools, and components within the project, and to minimize the potential for creating mixed wastes. Major elements of this program include area surveillances, containment, identification and control of hot particles, decontamination of areas, tools and equipment, reuse of contaminated tools within radiologically controlled areas, leak detection and repair, and the use of performance indicators in trending data to measure program effectiveness.

Guidance will also be given in procedures and specified on RWPs on the use of protective clothing to prevent personnel skin contamination.

3.2.2.5 Area Controls

Areas containing radiological hazards will be posted and designated in such a manner that personnel are made aware of the presence and extent of radiological hazards in the area. Areas will be posted based on the evaluation of survey results and the requirements of 10CFR 20.203.

1. Access to Radiologically Controlled Areas

Access (control points) will be specifically identified and controlled in a manner that will preclude inadvertent entry of unauthorized personnel. The use of RWPs will provide administrative control for access. Manned control points or escorted access may be instituted based on the nature of the work to be performed and the radiological hazards. The access control point will also ensure that personnel entering the radiologically controlled area meet the requirements of the governing RWP. Equipment at the access control point may include:

1. Personnel contamination monitors.
2. GM friskers.
3. Protective clothing.
4. Respiratory protection equipment.

2. Radiation Work Permits

A Radiation Work Permit (RWP) will be used to inform the radiation worker of the radiological hazards, provide instructions and administratively control personnel entering or working in areas that have or potentially could have radiological hazards present, which if not controlled properly, could present a potential hazard to personnel working in the area. Work techniques will be specified in such a manner that the exposure for all personnel (individually and collectively) will be maintained ALARA. Radiation work practices will be considered when procedures are developed for work which will take place in a radiologically controlled area.

Procedures will specify that the RWP identify personnel involved in the job and describe the job to be performed, protective clothing and equipment, monitoring requirements, and any special instructions or cautions pertinent to radiation hazards in the area.

The RWP will list the radiological hazards present in the work area, including area dose rates and the presence and intensity of hot spots, loose surface contamination, and other hazards as

appropriate. Radiation, contamination, and airborne surveys will be performed as required to define and document the radiological conditions for each job.

RWPs will be approved by an increasing level of radiation protection supervision based on anticipated hazards in the work area and the collective dose commitment (person-Rem) for the job. RWPs for jobs with low dose commitments and relatively low radiological hazards will be approved at the health physics supervisor level, while RWPs with a high dose commitment or significant radiological hazard are approved at the Facility Support Manager or Project Manager level.

3. Central Issuing Facility

A centralized location will be manned by radiation protection personnel to enable them to assist individuals in obtaining RWPs and personnel protection equipment.

3.2.3 Decommissioning ALARA Plan

The decommissioning project staff is committed to conducting all activities associated with the decommissioning of Fort St. Vrain site in a manner that will not compromise the health and safety of employees or the general public. During the decommissioning of Fort St. Vrain, radiation exposures of both occupationally exposed personnel and the general public will be maintained at levels which are as low as reasonably achievable (ALARA) and which are in compliance with 10 CFR 20.

3.2.3.1 ALARA Program Elements

Several program elements have been developed to provide a mechanism for the introduction of ALARA concepts into project activities on a daily basis. Specific elements include:

1. Engineered Controls
2. Radiation Work Permits
3. Task ALARA Budgets
4. Job Briefings
5. Implementing Procedures
6. ALARA Suggestion Program
7. Cost Benefit Analysis
8. Training and Use of Mockups
9. ALARA Performance Indicators
10. Management Involvement
11. ALARA Committee

Descriptions of the ALARA program elements are provided in the following paragraphs.

1. Engineered Controls

Engineered controls is a term which describes the general class of devices used to reduce exposure by reducing time spent in radiation areas or by limiting the exposure of personnel to radioactive material. Examples of engineered controls include, but are not limited to, such items as temporary shielding, specialty tools, contamination control containments, ventilation systems, decontamination, and remote surveillance systems.

2. Radiation Work Permits (RWP)

In addition to the normal controls specified by the RWP, RWPs will also be used as a source for obtaining exposure information. RWPs will be written in a manner which will allow tracking collective and individual exposures, and person-hours spent in RWP areas. This will also allow exposures and person-hours to be tracked by job, area of the project, and craft or job category. In addition, the RWP will be used to determine the amount of time spent working in respirators and protective clothing.

The knowledge gained by analyzing the various parameters will be used by the radiation protection staff to identify areas requiring increased attention or opportunities for dose savings. The information will be trended to assist in identifying problems or to demonstrate the adequacy of ALARA measures which have been implemented.

3. Task ALARA Budgets

Each major decommissioning task will be assigned a person-Rem or ALARA budget. Each budget will be established based on the anticipated person-hours, area dose rates and dose saving methods employed. The established budgets are not an estimate of the person-Rem commitment, but represent a goal that will require planning and proper execution of the task to attain.

The radiation protection organization, in conjunction with work supervisors and planning engineers, will determine ALARA budgets for major tasks. An action plan will be prepared for achieving these goals. Progress in meeting the budgets will be reviewed by the ALARA and Decommissioning Safety Review committees.

4. Job Briefings

Prior to starting any job or day's work, the man in charge shall call the entire crew together for a conference or "job briefing". The job briefing shall include an outline of:

1. The work to be done.
2. Each crew member's part in the job.
3. The hazards known or anticipated during the work.
4. The methods to be applied in protecting against such hazards.

The man in charge shall ask for and encourage questions, comments and suggestions during the briefing, and the briefing shall continue until each crew member understands the items covered so there can be no possibility of misunderstanding. If during the course of the work, changes in the plan become necessary, the crew members who are affected by the change must be called together and the change properly explained.

5. Implementing Procedures

The various facets of the ALARA program will be effected by implementing procedures. These procedures will describe the process of ALARA budgeting and approval, describe the methods used for dose tracking and trending, describe planning and use of engineered controls, and describe integration of ALARA planning into job planning and project modifications.

The radiation protection organization will review all decommissioning project work procedures that could affect personnel exposure, contamination control, or radwaste generation. This review takes place prior to final approval and identifies ALARA concerns, exposure reduction techniques, and ALARA hold points.

6. ALARA Suggestion Program

An ALARA suggestion program will be developed to ensure all employees have the opportunity to participate in identifying potential ALARA concerns or recommendations to the projects exposure reduction effort. All suggestions will receive review and response by the radiation protection staff to maintain open communications on ALARA issues.

7. Cost Benefit Analysis

Justification of radiation exposure reduction efforts may require comparison of costs and other impacts with expected benefits of the action to determine what level of protection is "reasonably achievable". Budget limitations may require that dose reduction actions be prioritized. For these reasons, rational methods such as cost benefit or value impact analysis will be used to aid in decisions regarding dose reduction actions.

8. Training and the Use of Mockups

Basic radiation worker training will acquaint all personnel assigned to work on the decommissioning project with the ALARA program. This training will define the ALARA concept, identify ALARA responsibilities and present examples of ALARA practices.

Radiation protection personnel training will be provided to personnel in the radiation protection organization to enable the staff to provide assistance to other groups in the design and identification of ALARA measures to reduce exposure.

Mock-up training will be given to individuals for complicated or high exposure jobs. This will ensure problems with the work plan or exposure reduction techniques are identified and solved prior to actual performance of the job.

9. ALARA Performance Indicators (APIs)

APIs are used to monitor and trend a variety of factors or indicators which give a good overall view of the ALARA program. APIs identify those areas where the ALARA program is performing effectively, as well as problem areas. APIs will be identified and implemented by radiation protection procedures. Examples of typical APIs include:

1. Respirator usage compared to the number of entries into controlled areas.
2. Rate of personnel contaminations.
3. Collective and individual exposures.
4. Number of positive bioassay results.

10. Management Oversight

Frequent visibility of and oversight by management personnel at the radiation work areas will promote an awareness of and concern for

the necessity of strict adherence to radiation protection procedures.

11. ALARA Committee

The ALARA committee will provide functional support to the radiation protection program and is responsible for development of ALARA task budgets, reviewing proposed engineering controls, reviewing ALARA suggestions, reviewing work packages, trending performance indicators, reviewing radiological occurrences and appropriate industry events, and supporting training activities.

3.2.3.2 Individual Responsibilities

ALARA is also the individual's responsibility. Individual worker responsibilities include the following:

1. Responsible for maintaining their individual exposure ALARA.
2. Responsible for assisting coworkers and others in maintaining their radiation exposure ALARA.
3. Compliance with radiation protection program requirements.
4. Limiting the release of radioactive materials to ALARA levels.
5. Reporting any unusual or deteriorating radiological conditions to the radiation protection staff.

3.2.3.3 Management Responsibilities

Project management will provide guidance and direct the implementation of ALARA policy as described in this section. Project management will establish priorities and allocate resources to ensure a coordinated and effective approach to the minimization of individual and collective doses, and minimize the release of radioactive material while maintaining a high level of project safety.

3.2.4 Surveillance Program

A project radiological surveillance program will be established to efficiently assess the radiological environment at the project site and effectively specify controls so that personnel are made aware of radiological hazards. The major elements of the surveillance program are radiological surveys, area access controls and RWPs (see Section 3.2.2.5 for discussion of RWPs).

3.2.5 Respiratory Protection Program

3.2.5.1 Introduction

The existing NRC-approved Fort St. Vrain Respiratory Protection Program will continue to be used during the decommissioning project.

3.2.5.2 Program Description

The PSC and Westinghouse team Radiation Protection Managers are designated to be responsible for directing all aspects of the respiratory protection program.

It is the intent of project management to minimize personnel exposure to air contaminated with radioactive dusts, mists, fumes, gases, or vapors. The primary means to achieve this goal will be to prevent or mitigate the hazardous condition at the source. Every reasonable effort will be made to achieve this objective by the use of engineered controls, including process modification, containment and ventilation techniques. Respirators may be prescribed at the discretion of supervision while controls are being instituted or evaluated or where effective controls are impractical.

Major elements of the respiratory protection program include:

1. Procedures
2. Training
3. Medical screening
4. Fit testing
5. Respiratory protection equipment maintenance records
6. Issue records
7. Compliance with air quality standards for supplied breathing air
8. Bioassay program
9. Quality Assurance

3.2.6 Radioactive Materials Control

Radioactive materials will be controlled through the use of inventory and accountability procedures. The radiation protection organization will be responsible for surveillance, posting and access control to all radioactive materials areas , as well as inventory and accountability of radioactive calibration and reference standards. Control of radioactive materials other than calibration and reference standards is described in Section 3.3.

3.2.7 Radiation Protection Facilities and Equipment

3.2.7.1 Introduction

Project management will provide facilities, equipment and instrumentation adequate to permit the staff to function efficiently. The facilities and the types and quantities of equipment to be provided will be adequate to meet the needs of the project.

3.2.7.2 Facilities

The following facilities will be required by the radiation protection organization:

1. Sample counting facilities.
2. Whole body count room.
3. Dosimetry issue and reading area.
4. Instrument issue, storage and calibration areas.
5. Decontamination facilities.
6. Access control areas.
7. Protective equipment cleaning, storage and issue areas.

3.2.7.3 Equipment

The following equipment will be required by the radiation protection organization:

1. Whole body counters.
2. Sample counting equipment.
3. Personal monitoring equipment.
4. Portable survey instruments.
5. Dosimetry and dosimetry processing equipment.
6. Personal protective equipment.
7. consumables such as smears and decontamination supplies.

3.2.8 Assessment and Reporting

3.2.8.1 Identification and Correction of Problems

A system will be established for identifying and reporting radiation protection problems and for instituting corrective actions. The system will include provisions for: identification, reporting, investigation, evaluation, identification of root cause, and implementing corrective actions. Problems and resolutions will be documented. Supervisory involvement in resolution and corrective

actions will be required as appropriate. Procedures will be developed which implement these provisions.

Examples of potential radiological problems include but are not limited to the following:

1. Violations of radiation protection procedures or regulations.
2. Failure of personnel to follow RWP requirements, posted instructions, or instructions of radiation protection personnel.
3. Uncontrolled spills or releases of radioactive materials in controlled areas.
4. Lost or off-scale dosimeters.
5. Damage to personnel protective devices or to radiation protection equipment and instruments.
6. Personnel skin contaminations and potential or actual internal deposition of radioactive materials.

3.2.8.2 Program Reviews

A comprehensive system of planned and periodic reviews will be implemented to verify compliance with all aspects of the radiation protection program. Reviews will be performed in the following areas:

1. Access Control to Radiation Areas
2. Radiation Surveys
3. Airborne Radioactivity Monitoring
4. Contamination Control
5. Respiratory Protection
6. Radiation Protection Training
7. Personnel Monitoring
8. Bioassay Program
9. Review of ALARA Program Implementation and Effectiveness

At least once every two calendar years, a technical review of the radiation protection program will be conducted by technically qualified personnel who are independent of the project radiation protection program. This review will encompass the elements delineated above.

3.2.8.3 Performance Indicators

Based upon nuclear industry practice and the recommendations in NRC and INPO guidance documents, several parameters have been selected

to aid in monitoring radiation protection performance goals. Goals for performance indicators will be recommended by the project staff and approved by the ALARA committee. Key overall indicators will include:

1. Annual collective dose.
2. Percent of project radiologically controlled area entries in respirators.
3. Rate of personnel clothing and skin contamination events.
4. Percent of jobs for which the measured collective dose varies from the pre-job estimate more than 25%.
5. Number of radiological incident reports.

3.3 RADIOACTIVE WASTE MANAGEMENT

This section addresses the technologies, equipment, and procedures to be implemented for the management of radioactive waste during the Fort St. Vrain (FSV) decommissioning project. These technical approaches are based upon experience and address facets of planning, decontamination, packaging, storage, transportation, volume reduction or beneficial reuse, and final disposition of the waste materials, while minimizing secondary wastes.

In developing the Radioactive Waste Management Program, many elements were considered, including the following:

1. End use of the facility.
2. Location and availability of disposal facilities.
3. Potential for off-site release during D/D operations.
4. Preventing contamination of uncontaminated areas.
5. Use of existing buildings to support the waste packaging operations.
6. Methods of approach related to waste type, waste class, and impact on safety.
7. Cost effectiveness.
8. Logical approach to the D/D operations.
9. Ensuring that the occupational exposures are maintained as low as reasonably achievable (ALARA).
10. Minimizing the impact on the health and safety of the general public.
11. Maintaining flexibility for waste management to allow for unexpected wastes and changes in available technology.

This section contains a description of the following activities associated with the radioactive waste management program:

1. Spent fuel disposal (3.3.1)
2. Radioactive waste processing (3.3.2)
3. Radioactive waste disposal (3.3.3)
4. Disposal of non-radioactive wastes (3.3.4)

3.3.1 Spent Fuel Disposal

Although not related to proposed decommissioning plans, the following information is provided on the ultimate disposition of the Fort St. Vrain spent fuel. The preferred plan for disposal of all Fort St. Vrain spent fuel is to ship the spent fuel to a DOE Facility in Idaho.

The original Three Party Agreement (Ref. 9) between PSC, General Atomic (GA) and the Atomic Energy Commission (AEC) provided storage for eight segments of Fort St. Vrain spent fuel at the Idaho National Engineering Laboratory (INEL) facility. To date, PSC has shipped three segments of spent fuel to INEL as a result of three previous refuelings. In 1988, the agreement was modified (Ref. 10) to clarify the intent of the agreement and to assure the storage of five remaining spent fuel segments (approximately 1242 fuel elements) at DOE Idaho, pending reprocessing or transfer to the federal high level waste repository (HLWR). Under terms of the existing Three Party Agreement, PSC is responsible for the interim storage of one segment of fuel (approximately 240 fuel elements) until the HLWR is available, now estimated to be available to receive Fort St. Vrain spent fuel in approximately 2020. The commitment to receive the ninth segment of spent fuel will be formalized in a contract with DOE.

The shipping schedule for the Fort St. Vrain spent fuel is planned to commence early 1991 and be completed in late 1991. Based on DOE verbal commitments, the shipping schedule will include the acceptance of the ninth and final segment of Fort St. Vrain spent fuel.

Due to the uncertain schedule for shipping of spent fuel to Idaho or other DOE facilities, PSC is pursuing an alternate plan to license, construct and operate an Independent Spent Fuel Storage Installation (ISFSI) in accordance with 10 CFR 72. To support this alternate plan, a 10 CFR 72 License Application was submitted in Reference 11.

The ISFSI facility will be located immediately adjacent to the current site. The actual location will be outside the plant's existing Protected Area, approximately 1500 feet northeast of the Reactor Building. The ISFSI, using the Modular Vault Dry Store (MVDS) System, is designed to store up to 1482 fuel elements, up to 37 MCRB's and up to 6 neutron sources. Utilizing the ISFSI alternative plan, defueling would be completed by mid 1992, which would allow decommissioning to commence not later than mid 1992.

3.3.2 Radioactive Waste Processing

3.3.2.1 Program Description

On-site radiological surveys will be performed to determine the extent of contamination or activation, and options for decontamination or disposal processing and packaging. Waste that requires processing on-site prior to packaging for transportation

will be processed in the Hot Service Facility (HSF), the compressor rooms (Reactor Building level 1, el. 4740'), and/or the Fuel Storage Building. Exact requirements will not be known until the radiological surveys have been performed and evaluated.

Items not considered for decontamination or items that, following decontamination, are considered to have too high a specific activity for off-site volume reduction, will be packaged and shipped directly for disposal at a licensed burial facility.

Greater than Class C (GTCC) wastes, if any, will be packaged for on-site storage and subsequent shipment to a designated storage or disposal facility.

Radioactive wastes are expected to be categorized as follows:

1. <u>Potentially contaminated or minor spot decontamination required:</u>

   Potentially contaminated materials that: 1) appear to be uncontaminated; 2) all surfaces are easily accessible; and 3) have a small surface area-to-weight ratio will be surveyed to determine if the material can be released for unrestricted use without decontamination or with minor decontamination effort. For example, a small surface area with only spot and/or smearable contamination can easily be decontaminated by such means as wiping, grinding, or removing the hot spot.

2. <u>General contamination with accessible surfaces and a low area-to-weight ratio:</u>

   Materials with readily accessible surfaces for purposes of surveying and decontamination, and that possess a low surface area-to-weight ratio may be shipped directly to a licensed offsite processing facility for decontamination of the surfaces and final disposition.

3. <u>General contamination/inaccessible surfaces/high surface area-to-weight ratio:</u>

   Smaller metallic scrap or metals with inaccessible surfaces for performing surveys (e.g., previously sheared material) will be assumed to be contaminated and be packaged for shipment for further processing at a licensed facility or shipped directly to burial.

4. Activated:

Activated materials and high specific activity materials (primarily concrete, metals and graphite components), will either be packaged and shipped direct for disposal or to a licensed facility for further processing and volume reduction.

Radioactive materials as categorized above will be evaluated to determine the optimum method for release, decontamination, or shipment offsite for further processing or for burial. The following onsite and offsite methods will be considered:

1. Onsite processing of liquid wastes.
2. Onsite filtration of airborne wastes.
3. Onsite decontamination.
4. Onsite waste volume reduction.
5. Onsite packaging.
6. Offsite decontamination.
7. Offsite volume reduction.
8. Offsite repackaging/consolidation for disposal.

3.3.2.2 Onsite Processing of Liquid Wastes

During the Fort St. Vrain decommissioning project, contaminated water will be generated through several processes (such as diamond wire cutting, flooding of the PCRV, rinsing of contaminated components removed from the PCRV) and through decontamination operations. Flooding the PCRV will put into solution radionuclides that exist in the PCRV as a result of activation and plateout. Of primary concern are tritium and the gamma-emitting isotopes Cs-137 and Co-60. Based on data analysis and research of tritium release rates from graphite, tritium pickup by the water is initially expected to be relatively large.

After the initial tritium pickup by the water, the leach rate is expected to stabilize at a level below 0.5 Ci/day a few weeks after the PCRV is flooded. This lower rate will not present any handling problems because the PCRV will remain sealed or otherwise controlled. The tritium cannot be removed by mechanical means, and therefore normally will be discharged by controlled releases to the normal effluent pathway by a controlled bleed and feed procedure via the cooling tower blowdown line. The outlet stream from the demineralizers will be routed to the cooling tower blowdown line, and makeup water will be added to the system. After one to two months of water cleanup and clarification system operation, the

total tritium concentration in the PCRV is expected to reach an equilibrium level well below the unrestricted release limit for water discharge (0.003 microCi/cc).

During unforeseen instances or circumstances that preclude use of the normal discharge path, the water may be directed to interim short term storage until a controlled discharge can be performed.

Other radionuclides (particulates) can be removed using the water system with ion exchange resins or particulate filters. The contaminated water will be purified to releasable levels as defined in 10 CFR 20 Appendix B by means of the disposable demineralization and filtration system, which is a part of the PCRV water cleanup and clarification system described in Section 2.3.3.6.

Operating simplicity of this system will minimize the radwaste movement, handling and personnel exposure. Spent resins and filter media requiring stabilization will be processed in accordance with the Process Control Program (PCP). When possible, this will be done inside the disposal package or liner to minimize additional waste handling prior to disposal.

3.3.2.3 <u>Release of Airborne Contamination</u>

Some low-level airborne wastes may be generated during decommissioning. Disposal of airborne radioactive wastes will be accomplished by filtration (of particulates) and disposal of the filter as solid waste.

3.3.2.4 <u>Onsite Decontamination Techniques</u>

Standard industry decontamination techniques will be used and may include the following:

1. Strippable Coatings: Strippable coatings may be used to lift particulates from contaminated surfaces. A strippable coating is applied "wet" to a surface in a manner similar to painting a surface. Additives in the coating are designed to attract and combine chemically with radioactive contaminants. Once the coating is dry, the contaminant is locked in the dried coating. The dried coating is easily "peeled" to allow stripping of the film containing the contamination. The stripped film can then be packaged and buried as a solid waste. Strippable coating may also be used to protect surfaces from becoming contaminated.

2. Chemical or Solvent Decontamination: Chemical decontamination is utilized principally for batches and is best used on a production basis, for large volumes of similar materials, but may result in a hazardous radiologically contaminated mixed waste (See Section 3.3.3.5). There are no current burial grounds for mixed wastes. However, with the proper selection of technologies and chemicals, certain mixed wastes can be converted to a solidified non-hazardous waste product that is classified only as radiological waste.

3. Dry Abrasive Impingement: Dry abrasive impingement (e.g., sandblasting) is effective for removing heavy or tightly adhering oxide films.

4. Fixatives: The application of fixatives may be used to fix transferable contamination prior to cutting or packaging.

5. Vacuum Cleaning: HEPA filtered vacuum cleaners may be used in areas of high gross transferable contamination.

3.3.2.5 Onsite Waste Volume Reduction

Several waste types and forms will be generated during decommissioning and radwaste processing operations. These include waste generated from sectioning of contaminated or activated components, general waste such as consumables, filters from the decontamination or sizing operations, secondary wastes from decontamination, or beneficial reuse processing such as slag, abrasives, and solidified liquids. Waste minimization is an important consideration in handling and processing radioactive wastes. Therefore, the waste minimization and volume reduction techniques discussed below will be used as appropriate.

Waste minimization practices shall include:

1. Personnel training to minimize waste generation.

2. Segregation of Radioactive Waste

   Known radioactive waste will be separated from potentially non-radioactive waste.

3. Waste Handling

   Waste handling procedures will be implemented that will maximize packaging efficiencies of containers, utilize reusable containers and clothing, and streamline waste collection and transport processes.

4. Facility Lay-down Areas

   Lay-down areas will be selected to maximize the ease and efficiency of waste handling. Selection of the lay-down area will consider proximity, adequacy of space, waste flow paths, lack of interference with other decommissioning activities, and minimization of the spread of contamination.

5. Radioactive Waste Monitoring Equipment

   The most effective methods and equipment for monitoring the processing of radioactive materials will be used. This will assure the adequacy of operation, waste segregation, and confidence that the equipment will perform as required and expected in the station environment.

Project management, task supervisors, and performance level personnel will incorporate radioactive waste minimization practices. Performance indicators will be developed to track total radioactive waste generated during decommissioning and the actual volume of waste generated for an evolution will be compared to the pre-job estimate for that task.

3.3.2.6 <u>Onsite Waste Packaging</u>

Radioactive waste packaging at Fort St. Vrain will be performed in areas that minimize radiation exposure to personnel, control the spread of contamination, and are adequate for packaging activities. Examples of potential onsite waste packaging areas are:

1. Reactor Building refueling floor
2. HSF
3. Compressor rooms (Reactor Bldg., El. 4740')
4. Fuel Storage Building
5. Temporary facilities designated for waste packaging

Waste packages will be selected for each waste stream that meet requirements for transportation and disposal. Shielded casks will

be utilized as required for reducing the radiation dose rate to levels as directed by regulation or to meet requirements for package type (i.e. Type A or Type B containers).

To the maximum extent practicable, voids in disposal containers will be filled with other decommissioning debris. This will reduce the total volume of waste for disposal. Therefore, since voids in packages are filled with wastes that would otherwise be packaged separately for burial, a superior waste form is produced, efficiency is maximized, and project cost, disposal site allocation usage, and transportation risk are minimized. Alternatively, the onsite use of a mobile super compactor may be a more cost effective means of volume reduction. When appropriate waste segregation and packaging have occurred, the waste will be transported directly for disposal or transported to an offsite licensed facility for further processing and final disposition.

3.3.2.7 <u>Offsite Shipments of Radioactive Materials for Further Processing</u>

Based on cost benefit analyses, a significant volume of radioactive material generated during the decommissioning effort may be shipped offsite to be volume reduced by one of the methods described in the following paragraphs.

Waste packages sent to offsite facilities will primarily be sea/land containers selected to meet requirements for transportation and receipt at the processing facility. Voids in transport containers are not a critical concern. However, efficient management of transportation resources will be an important consideration to minimize project costs and reduce the number of shipments made. Only radioactive materials which are acceptable according to the individual license(s) of the receiving facility will be transported to that offsite processing facility.

Radioactive material control and accountability procedures to accurately track material originating from Fort St. Vrain during receipt, sorting, processing, and packaging for disposal will be developed and implemented. Only offsite processing facilities that provide adequate radioactive material control and accountability procedures will be selected to perform decontamination, volume reduction, or other waste processing services.

3.3.3 Radioactive Waste Disposal

3.3.3.1 Program Description

The radioactive waste disposal program will follow the regulations established in 10 CFR 20 and 10 CFR 61, the disposal site criteria, and other applicable Federal and State regulations. The waste will be processed, packaged, and prepared for shipment. Radioactive waste may be stored onsite on an interim basis, subject to the storage and separation criteria established in Sections 3.4 and 10.

GTCC waste, if any, will be stored in the adjacent ISFSI or in a structure which meets the design requirements to handle GTCC waste. The waste will be stored until such time as it can be transported to a facility licensed to accept the GTCC waste.

3.3.3.2 Projected Radioactive Waste Generation

The initial estimate of the processed and volume reduced radioactively contaminated waste for disposal is 100,072 cubic feet, with 99,219 cubic feet from the PCRV and associated operations, and 853 cubic feet from the balance of plant (BOP). The waste from the PCRV consists of activated concrete, graphite blocks, other activated components, miscellaneous equipment and piping, and concrete rubble. PCRV waste is contaminated principally with Fe-55, tritium, and Co-60. The waste from the BOP consists of tanks, pumps, HVAC filters, and miscellaneous equipment and piping. There may also be radioactively contaminated asbestos.

After processing and volume reduction, it is estimated that the volume of radioactive waste will be segregated into the following categories:

Class	Volume (cubic feet)
A	70,768
B	28,293
C	1,011

Due to uncertainties in the analysis, as much as 400 cubic feet of Class C wastes may be reclassified as GTCC. Waste volume estimates will change as ongoing planning and decommissioning operations proceed. Tables 3.3-1 and 3.3-2 identify the radioactive wastes that may be shipped for further processing. The pre-volume reduction totals and number of waste containers are delineated on Tables 3.3-3 and 3.3-4.

3.3.3.3 Classification of Radioactive Wastes

Classification of radioactive wastes will be determined by direct survey, isotopic analysis for the presence of radionuclides and determination of the concentrations of these radionuclides relative to the weights of components or component parts. This classification will be performed in accordance with 10 CFR 61 requirements prior to transportation.

3.3.3.4 Transportation Plan

Before packaging waste for shipment from Fort St. Vrain, each package will be inspected to determine its adequacy for retaining the radioactive contents and its proper condition for shipment. Bar code capable of being read by computerized scanners will typically be affixed to the container and the corresponding lid.

Waste will be packaged into waste packages that meet 49 CFR and 10 CFR 71 requirements. Certain wastes may require use of an approved shipping cask due to radiation levels or limits for quantities of radioactivity. Trucks will be the primary method of transportation during this decommissioning project.

Special shielded shipping containers may be used for the steam generator primary assemblies. The removal process and shipping container are described in Section 2.3 of this plan. It is anticipated that the shipping container with the steam generator and grout will be shipped by rail for disposal at the Richland burial site.

Transportation surveys and documents will be prepared prior to any shipment offsite. To determine isotopic inventory and concentration for classification, onsite personnel will assess each loaded shipping container prior to transport. Waste class and shipping containers are identified in Tables 3.3-5 and 3.3-6.

The actual routing of shipments may vary with weather and highway conditions. Additionally, local and state restrictions pertaining to radioactive material transport may affect some route selections, particularly in congested metropolitan areas. The carrier is responsible for selecting the appropriate route, which must conform to applicable federal, state, and local regulations. Trained personnel will inspect and oversee shipping, in accordance with DOT and NRC regulations.

3.3.3.5 Contingency Plans (Mixed Waste)

No sources of mixed waste are known to exist onsite. No chemicals or other substances are anticipated to be used during decommissioning operations that may become hazardous wastes. It will be necessary for project management to authorize the use of any chemical or other substance that may become hazardous waste. If mixed waste is identified, it will be classified and stored onsite until regulations allow declassification or disposition.

3.3.4 Disposal of Non-Radioactive Waste.

Non-radioactive wastes will be disposed of by release to appropriate disposal facilities such as land fills, scrap yards and scrap recovery facilities. Materials that are inappropriate for surface surveys, such as resin fines, will be sampled and appropriately analyzed. Materials found to be non-contaminated will be disposed of as non-radioactive waste.

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Table 3.3-1
PCRV WASTE CLASSIFICATION AND VOLUME REDUCTION

	A	B	C	>C	STABI-LIZE	INCI-NERATE	COMPACT	MELT	OVERFILL
Region constraint devices	X						X		
RCD Pins				X	X				
Metal Control Rod Reflectors				X	X				
Metal block - non-control rod		X			X				
Defueling elements	X					X	X		
Top reflector graphite blocks	X								
Bottom reflector graphite blocks	X								
Radial reflector graphite blocks	X								
Large reflector blocks		X			X				
1/2-size reflector blks		X			X				
Upper reflector keys	X						X	X	
Side spacer blocks w/boron pins									
Boron pins		X			X				
Blocks with pins removed	X						X		
Bottom reflector blocks w/Hastelloy cans:									
Hastelloy cans			X		X				
Blocks w/out cans	X								
Lower reflector keys		X			X				
Core support blocks	X						X		
Core support posts	X					X	X		
Core support floor columns	X						X	X	
Misc steel beneath CSF	X						X	X	
Metal on large side reflector	X						X	X	
Core barrel	X							X	
Lower plenum insulation	X						X		
Silica blocks	X						X		
Concrete - top	X								
Concrete - CSF	X								
Concrete - side	X								
Concrete rubble	X								X
Misc. Inconel parts (CSF)	X						X		
Concrete cutting debris	X						X		
Helium purifiers (PCRV head)	X						X		
Helium diffusers	X						X		X
Helium circulators	X						X		
He Circ shutoff valve assembly	X						X		
Helium bellows	X						X		
Steam generators	X								
Lower floor/appurtenances	X						X	X	
Platform/ tools /jib cranes	X						X	X	
Crane cable/drum/3 bucket invrtr	X						X		
Resins	X				X				
Miscellaneous soft waste	X						X		
Reactor isolation valve	X						X	X	

Table 3.3-2
CONTAMINATED BOP WASTE CLASSIFICATION
AND VOLUME REDUCTION

	A	B	C	>C	STABI-LIZE	INCI-NERATE	COMPACT	MELT	OVERFILL	DECON ONSITE	DECON &/SEG
Miscellaneous soft waste	X						X				
Reactor isolation valves	X						X	X			
Refueling sleeves	X						X	X			
Refueling sleeve sand	X								use as o/f		
Sand from FSWs	X								use as o/f		
ATC	X									X	
ATC sand	X								use as o/f		
ESW sand	X								use as o/f		
Hot service facility	X									X	
HSF sand	X								use stab.		
Core support vent filters	X						X				
Gaseous waste surge tanks	X										X
Gaseous waste surge tank sand	X								use as o/f		
Liquid drain tank	X										X
Gas waste vacuum tank	X										X
Gas waste vacuum tank sand	X								use as o/f		
Gas waste compressors	X						X				
Gas waste compressor sand	X								use as o/f		
Liquid monitor tank	X										X
Liquid waste monitor tank sand	X								use as o/f		
Liquid waste demineralizers	X						X				
Liquid waste receivers	X										X
Liquid waste receivers sand	X								use as o/f		
Liquid waste sump sand	X								use as o/f		
Liquid transfer pumps	X						X				
Liquid waste sump pumps	X						X				
Liquid waste resins	X								use as o/f		
Liquid waste filters	X				X						
Decon solution tank	X										X
Decon solution tank sand	X								use as o/f		
Decon recycle pump	X						X				
Decon chemical supply pump	X						X				
Purified helium filters	X					X					
Helium removal filter	X						X				
Helium getter units	X						X				
HVAC filters	X						X				
Small & large bore piping	X						X	X			
FHM	X									X	
FHM Components	X						X				
FHM sand	X								use as o/f		
Solid waste compactor	X						X				

Table 3.3-3
PCRV WASTE VOLUME ESTIMATES

ITEM/SYSTEM	CLASS	R/hr CONTACT	LSA	NUMBER	RFP VOLUME	VOLUME (FT3)*	NO. OF CONTAINERS	Ci/ LOAD
Region constraint device & pin	C	70		84	33.6	235.2	34	
Metal control rod reflectors	>C	3000	No	37	12.7	401	100	
Metal block - non control rod	B	300	No	276	81.2	2025	270	800/10800
Defueling blocks	A	Contam.		1482	4661.5	7200	75	
Top Reflector graphite blocks	A*	0.5		1215	983.8	1515	16	368/982
Bottom reflector graphite blocks	A*	0.5		1215	918.2	1414	15	
Radial reflector - perm. & rmvble	A*	0.5		480	1236.0	1903	20	200/600
Large reflector blocks	B*	0.5 - 10	No	312	1377.5	12600	1680	570/7975
1/2-size reflector blocks	B*	0.5 - 10	No	312	275.5	2160	288	570/7975
Upper reflector keys (carbon steel)	A	<0.05		24	13.4	192	2	
Side Spacer blocks w/boron rod:		30		1152	1553.8			
boron rods	B	60	No	309792	197.8	495	66	146/1921
Blocks w/rods removed	A*	<0.1	No	1152	1553.8	2393	25	2995/14976
Bottom ref. blocks w/Hastelloy cans		300		276	529.7			
Hastelloy	C	10000	No	20061	2.9	375	50	[illegible]
Blocks with cans removed	A*	0.5		276	529.7	816	8	274/822
Lower reflector keys (Hastelloy)	B	1000	No	24	3.6	180	24	24/336
Core support blocks	A*	<0.1		61	935.5	1468	15	20/100
Core support posts	A	<0.1		183	113.0	174	2	
Core support floor columns	A			12	360.0	636	7	
Misc. steel from beneath CSF	A	<0.1				960	10	
Metal on large side reflector	A	<0.1		24	13.8	96	1	
Core barrel	A	.02		1	517.0	1400	31	
Lower plenum insulation	A	<0.001			918.2			
Silica blocks (25,000 lbs.)	A	0.5			335.5	503.[illegible]	12	/300
Concrete - top	A	<0.2				3744	9	
Concrete - csf	A	<.015				6240	15	
Concrete - side	A	<.005				18720	45	
Concrete rubble - jackhammer	A					706	16	
Misc. inconel parts on csf	A	0.4			153	415	5	
Concrete cutting debris - top	A				210	210		
Concrete cutting debris - csf	A				200	200		
Concrete cutting debris - side	A				325	325	8	Total debris
Helium purifiers in PCRV head	A			10		480	5	
Helium diffusers	A	<0.1		4		1752	4	Fill with LSA
Helium circ. shutoff valve assembly	A	<0.1		4		192	2	
Helium bellows	A			12		1560	12	
Thermocouples & guide tubes	B					105	14	
Steam generators	A			12		20736	12	
Lower floor/appurtenances	A					1200	42	
Platform/handling tools/jib cranes	A					576	6	
Crane cable/drum/3 bucket inverters	A					512	5	
Mobilize trucks & initial containers								
Graphite block drying equipment								
Resins - solidify, ship, bury	A			20		2720	20	
Misc. soft waste	A					12000	125	
PCRV TOTALS						111,535	3095	

*Pre-volume reduced quantity.

Table 3.3-4
BOP WASTE VOLUME ESTIMATES

ITEM/SYSTEM	CLASS	R/hr CONTACT	LSA	NUMBER	RFP VOLUME	VOLUME (FT3)*	NO. OF CONTAINERS	Ci/ LOAD
Reactor isolation valves	A			5	785	960	10	
Refueling sleeves	A			2	160	192	2	
Sand from fuel storage wells	A					750		
Sand from equipment storage wells	A					225		
Sand from Helium regeneration pit	A					135	18	
Auxiliary transfer cask sand	A					15	2	
Hot cell facility	A					384	4	
Sand from hot cell facility	A					500	67	
Core support vent filters	A				8	15	2	
Gaseous waste surge tanks	A			2	1872	2646	2	
Liquid drain tank	A			1	20	20	1	
Gaseous waste vacuum tank	A			1	676	980	1	
Gaseous waste compressors	A			2	1200	2058	2	
Liquid waste monitor tank	A			1	520	576	1	
Liquid waste demineralizers	A			2	56	192	2	
Liquid waste receivers	A			2	1040	1152	2	
Liquid waste sump (sand)	A					22.5		
Liquid transfer pumps	A			2	5	96	1	
Liquid waste sump pumps	A			2	16			
Liquid waste filters	A			2	6	15	2	
Decon solution tank	A			1	100	360	1	
Decon recyle pump	A			1	3			
Decon chem supply pump	A			1	3			
Purified Helium filters	A			2	14			
Helium removal filter	A			1	16	96	1	
Helium getter units	A			2	40			
HVAC filters	A							
Fuel handling machine	A					192	2	
Fuel handling machine sand	A					420	56	
Small and large bore piping	A					576	6	
TOTALS						12577.5	185	

*Pre-volume reduced quantities.

Table 3.3-5
WASTE CLASS AND CONTAINER TYPE FOR PCRV

	A	B	C	>C	LSA STD	LSA NON-STD	TYPE A	TYPE B	CASK	SHIELDED VAN
Region constraint devices	X				X					
RCD pins			X				X		X	
Metal control rod reflectors				X				X	X	
Metal block - non control rod		X					X		X	
Defueling blocks	X				X					
Top reflector graphite blocks	X				X					X
Bottom reflector graphite blocks	X				X					X
Radial reflector graphite blocks	X				X					X
Large reflector blocks		X					X		X	
1/2-size reflector block		X					X		X	
Upper reflector keys	X				X					
Side spacer blocks w/boron rods:										
Boron rods		X					X		X	
Blocks with rods removed	X				X					
B/refl blks w/hastelloy cans:										
Hastelloy cans			X				X		X	
Blocks without cans	X				X					X
Lower reflector keys		X					X		X	
Core support blocks	X				X					
Core support posts	X				X					
Core support floor columns	X				X					
Misc. steel from beneath csf	X				X					
Metal on large side reflector	X				X					
Core barrel	X				X					
Lower plenum insulation	X				X					
Silica blocks	X				X					X
Concrete - top	X					X				
Concrete - csf	X					X				
Concrete - side	X					X				
Concrete rubble	X				X					
Misc. inconel parts on csf	X				X					X
Concrete cutting debris	X				X					
Helium purifiers in PCRV head	X					X				X
Helium diffusers	X					X				
Helium circulators	X					X				
Helium circ. shutoff valve assy	X				X					
Helium bellows	X					X				
Steam generators	X					X				
Lower floor/appurtenances	X				X					
Platform/handl. tools/jib cranes	X				X					
Crane cable/drum/3 bucket inverters	X				X					
Resins	X					X			X	
Miscellaneous soft waste	X				X					
Reactor isolation valves	X				X					
Refueling sleeves	X				X					

Table 3.3-6
WASTE CLASS AND CONTAINER TYPE FOR BOP

	A	B	C	>C	LSA STD	LSA NON-STD	TYPE A	TYPE B	CASK	SHIELDED VAN
Miscellaneous soft waste	X				X					
Reactor isolation valves	X				X					
Refueling sleeves	X				X					
Refueling sleeve sand	X				X					
Sand from fuel storage wells	X				X					
Auxiliary transfer cask sand	X				X					
Sand from equipment storage wells	X				X					
Hot service facility	X				X					
Sand from hot service facility	X				X					
Core support vent filters	X				X					
Gaseous waste surge tanks	X				X					
Gaseous waste surge tank sand	X				X					
Liquid drain tank	X				X					
Gaseous waste vacuum tank	X				X					
Gaseous waste vacuum tank sand	X				X					
Gaseous waste compressors	X				X					
Gaseous waste compressor sand	X				X					
Liquid waste monitor tank	X				X					
Liquid waste monitor tank sand	X				X					
Liquid waste demineralizers	X				X					
Liquid waste receivers	X				X					
Liquid waste receiver sand	X				X					
Liquid waste sump sand	X				X					
Liquid transfer pumps	X				X					
Liquid waste sump pumps	X				X					
Liquid waste resins	X				X				X	
Liquid waste filters	X						X			
Decon solution tank	X					X				
Decon solution tank sand	X				X					
Decon recyle pump	X					X				
Decon chemical supply pump	X					X				
Purified helium filters	X					X				
Helium removal filter	X				X					
Helium getter units	X				X					
HVAC filters	X				X					
Small and large bore piping	X				X					
Fuel handling machine components	X				X					
Fuel handling machine sand	X				X					
Solid waste compactor	X				X					

3.4 ACCIDENT ANALYSIS

3.4.1 Introduction and Description of Decommissioning Accidents

The purpose of this section is to evaluate the impact of potential Fort St. Vrain decommissioning accidents on the health and safety of the public. The activities, equipment and circumstances associated with decommissioning are different from those evaluated in the Fort St. Vrain Final Safety Analysis Report (Ref. 12) for power operations and refueling. Therefore, accidents analyzed for decommissioning are different from those evaluated for power operations and refueling.

The risk of accidents resulting in a radiological release during decommissioning activities is considerably less than during plant operation, due to the removal of irradiated fuel from the Reactor Building. Since the reactor will be defueled prior to the commencement of decommissioning operations and all fuel will be removed from the Reactor Building, only non-reactor accident scenarios will be evaluated in this section. The focus of these decommissioning accident analyses will be on public health and safety.

The following postulated accident scenarios have been analyzed, considering activation levels and isotopic composition of components to be processed, and the anticipated dismantling activities:

1. Dropping of contaminated concrete rubble
2. Conversion construction near PCRV dismantlement
3. Heavy load drop
4. Fire
5. Loss of PCRV shielding water
6. Loss of Power
7. Natural disasters

The components with the highest activation levels were used in the accident analyses. Therefore, accidents that were analyzed bound the radiological consequences from other postulated accident scenarios. In evaluating the postulated accidents, conservative assumptions were made when data or knowledge to support more realistic analyses were lacking. Conservatism in this context is defined to mean that the radiological consequences from the postulated accidents will be overestimated rather than underestimated.

A frequency-consequence diagram (Ref. 13) is shown in Figure 3.4-1; this figure defines three regulatory regions which are bounded by consequence limits established in 10 CFR 50 Appendix I, 10 CFR 100, and the EPA Protective Action Guidelines (Ref. 14). Postulated accidents are assigned to one of the regions on the basis of their predicted consequences. The three regions are defined as follows:

1. Anticipated Operational Occurrences (AOOs) - events that are expected to occur once or more in a plant's lifetime and whose dose consequences are analyzed in the plant's Safety Analysis Report (SAR) to demonstrate compliance with 10 CFR 50 Appendix I criteria.

2. Design Basis Events - events which are not expected to occur in the lifetime of the plant but may occur in a large population of plants. These events are analyzed in the SAR to demonstrate compliance with criteria established in 10 CFR 100.

3. Emergency Planning Basis Events - events that are not expected to occur in the lifetime of most plants. The consequences of these events are analyzed in the EPA Protective Action Guidelines (Ref. 14) to establish criteria for emergency planning and environmental protection assessments.

As shown in Figure 3.4-1, the decommissioning accidents or events analyzed in this section are generally calculated to fall in the region of the Emergency Planning Basis Events, due to the low probability and low consequences of the decommissioning accidents.

A capsule summary of the accident scenarios is given in Table 3.4-1. A summary of postulated accident dose consequences is presented in Figure 3.4-2. The doses to an individual located off site (100 meters from the Reactor Building) from these scenarios are presented in Table 3.4-2. From this table, the limiting accident is a fire resulting in a whole body dose of 121 mRem and a dose of 215 mRem to the organ (lung). These doses are well within the 25 Rem whole body dose and 300 Rem to any specific organ guidelines established by 10 CFR 100. These doses are also a small fraction of the one Rem whole body dose and five Rem to any specific organ guidelines cited in EPA Protective Action Guidelines (Ref. 14).

The following natural disasters were considered in the accident analyses and are discussed in Section 3.4.9.

External Event	Mitigating Feature	Radiological Consequence
Earthquake	Low Probability of Occurrence	Not postulated; See Section 3.4.9
High Winds, Hail	Bounded by Tornado	See analysis in Section 3.4.9
Rainfall, Flood	Site Location	No release
Range Fire	Plant buffer	No release

The activity concentrations of the various components used in the following accident analyses were derived from the detailed neutron activation analysis (Ref. 2), described in Section 3.1.4 and provided in Appendix II. Where chemical impurities were involved in neutron activation reactions, the maximum impurity levels permitted by the pertinent specifications were conservatively assumed to exist. With the exception of tritium concentrations, the radioisotope concentrations of interest used in the accident analyses have been taken directly from the activation analysis. Tritium concentrations predicted by the activation analysis were considered extremely unrealistic for the following reasons:

1. In the activation analysis, the dominant source of tritium was from activation of lithium impurities. The activation analysis assumed that no tritium formed by lithium activation migrated out of the graphite into the primary coolant. The lithium concentration assumed to be present prior to irradiation in the graphite blocks was based on the maximum concentration permitted by the specifications. In actuality, lithium is relatively volatile and tends to migrate out of the graphite during the high temperature graphitization process. Therefore, it is considered probable that the lithium impurity concentrations in the graphite used to form the large side reflectors and side spacer blocks were an order of magnitude lower than the maximum specification limit.

2. The large graphite side reflectors and side spacer blocks were exposed to relatively low temperatures (300-500 degrees C) during reactor operations. These low temperatures preclude a significant amount of tritium from being chemically absorbed in the graphite and retained. Since tritium has a small atomic radius, it is likely that

tritium formed by activation of lithium (Li-6 and Li-7) will migrate out of the graphite. Due to this temperature dependence of chemical absorption, it is considered that tritium concentrations are two or three orders of magnitude below those predicted by the activation analysis.

3. In the presence of moisture, hydrogen atoms from water molecules compete with and replace tritium atoms at active carbon sites in the graphite matrix, releasing tritium from the graphite. Before the graphite blocks are removed from the PCRV, they will be submerged under water when the PCRV is flooded, which is expected to result in the release of a substantial fraction of tritium.

Based on the effects noted above, it is considered that a value of 10 uCi/g of tritium represents a conservative estimate of tritium concentration in the large side reflector and side spacer blocks (Ref. 15). While this concentration is a factor of approximately 40 below that projected in the activation analysis for these blocks, it provides a more realistic representation of the tritium concentration of the graphite blocks after they are removed from the PCRV. Therefore, a tritium concentration of 10 uCi/g in the large side reflector and side spacer blocks is assumed for the postulated decommissioning accident scenarios.

3.4.2 Assumptions

The following are the major assumptions used in the analysis of postulated accidents which may occur during the dismantling activities:

1. The reactor is defueled and all irradiated fuel is removed from the Reactor Building.

2. Since all fuel is removed from the reactor, there will be no need for shutdown/cooldown systems such as decay heat removal.

3. The Reactor Building ventilation system will remain operable, providing filtration of effluents to the environment, while the potential exists for drop of a large activated graphite block.

4. The analyses for some of the accidents conservatively assume a Curie content that exceeds allowable Curie

contents for a Low Specific Activity (LSA) Type A-2 waste container, as specified in Table A-1 of 10 CFR 71.

5. A worst case atmospheric dispersion factor of 3.53 E-2 sec/m^3 has been calculated and is used in the accident analyses, with the exception of the tornado accident, which utilizes an atmospheric dispersion factor of 4.59 E-4 sec/m^3. These atmospheric dispersion factors were calculated using the guidelines presented in Regulatory Guide 1.145 (Ref. 16) and are based on an exclusion area boundary (EAB) of 100 meters. The atmospheric dispersion factor of 4.59 E-4 sec/m^3 represents the annual average dispersion factor for Fort St. Vrain, and is considered to be conservative in the event of a tornado.

6. All releases to the environment are assumed to be ground level releascs.

3.4.3 Dropping of Contaminated Concrete Rubble Accident

3.4.3.1 Identification of Cause

After the majority of the PCRV top head concrete is removed in large pieces by diamond wire cutting, the last six inches (just above the PCRV top head liner) will be removed by utilizing a mechanical breaker to break up the concrete around the perimeter of the PCRV top head liner, enabling the removal of the remaining concrete wafer in sections. This accident scenario assumes that radioactivity is released from the drop of a rubble transport container due to a faulty crane or operator error.

3.4.3.2 Accident Description

An activation analysis performed for Fort St. Vrain (Ref. 2) shows that the highest concentration of radioactivity in the PCRV concrete is in the six inch increment of the PCRV top head immediately above the top head liner as shown in Table 3.4-3. The values in Table 3.4-3 are based on three years decay, the approximate time frame in which the dismantling work is expected to take place. The percentage contribution of activation products within this concrete is given in Table 3.4-4. As shown, nearly 100 percent of the total activity is accounted for by the nuclides listed. Assuming that the Fe-55 and Co-60 are not released to the atmosphere from a concrete rubble accident (since these activities are embedded in the rebar), the remaining activities available for release represent less than eight percent of the total. However, it is conservatively assumed

that ten percent of the total activity resides in the concrete. It is also assumed that, of the total releasable activity in the concrete rubble, 40 percent is due to tritium and 60 percent is due to the remaining nuclides.

Since Eu-154 has the highest inhalation dose conversion factors for whole body and organ doses (the highest of the nuclides in the 60 percent), it is assumed that all of the activity of the remaining nuclides (60 percent) consists of Eu-154. The analysis also conservatively assumes that ten percent of the concrete in the six-inch thick concrete segment is involved in the accident. Of this amount, only one percent of the tritium and one percent of the Eu-154 are assumed to be released.

The airborne activity was calculated to be 3.93 milliCuries of tritium and 5.90 milliCuries of Eu-154. No credit was taken for particulate filtration by the Reactor Building ventilation system. The major exposure pathway was assumed to be air inhalation by an adult standing at the EAB (100 meters) and was assumed to occur over a two hour period. The dose conversion factor used for tritium was 1.58 E-07 mRem/pCi inhaled for whole body and any organ. The dose conversion factors used for Eu-154 were 6.48 E-05 mRem/pCi for whole body dose and 7.40 E-04 mRem/pCi for bone (the highest inhalation organ dose). These dose conversion factors were taken from NUREG-0172 (Ref. 17). The adult breathing rate was 3.47 E-04 m^3/sec (Ref. 12, Section 14.12).

3.4.3.3 Analysis of Effects and Consequences

The whole body and bone doses to an individual standing at the EAB were calculated to be 4.69 mRem and 53.5 mRem, respectively. The whole body dose was 0.01 mRem from tritium and 4.68 mRem from Eu-154. The bone dose was all from Eu-154 since tritium does not have a dose conversion factor for bone.

3.4.4 Conversion Construction Accident Near PCRV Dismantlement

3.4.4.1 Identification of Causes

1. Crane Failure:

An evaluation was performed on the potential impact of a construction crane toppling which would impact the Reactor Building. Due to the proximity of the planned new steam generator building to the Reactor Building, it will be possible for a crane boom to strike the Reactor Building above the refueling floor level.

A crane boom is relatively light and fragile. An impact with the Reactor Building is not expected to cause structural damage to the building. Additionally, LSA containers outside the Reactor Building will be protected if they are stored within the fall radius of the construction cranes. At worst, the crane boom could drape over the reactor siding. No radiological impact is expected from such an accident. This accident is bounded by the heavy load drop (Section 3.4.5) and tornado (Section 3.4.9).

2. Explosion/Fire Due to Natural Gas Line Leak:

Fort St. Vrain will be repowered by a natural gas-fired boiler. The most severe accidents that can be postulated during decommissioning activities involve a natural gas line leak resulting in an unconfined vapor explosion or fire, or an explosion of the gas-fired boiler itself. The decommissioning and repowering schedules have been reviewed. There is over a year between completion of the removal of highly radioactive components (graphite blocks) from the PCRV and introduction of natural gas on site. In the event of a slippage in the dismantling schedule, administrative controls will be implemented to prevent charging the gas-fired boiler natural gas line on site concurrent with handling of the activated graphite blocks from the PCRV. Therefore, given the actual schedule and administrative controls, an explosion or fire due to a natural gas line leak is not credible during the decommissioning process.

Accidental release of activity caused by a postulated explosion of a container of flammable gas, such as those used to support decommissioning (e.g., propane or acetylene tank or bottle), was taken into consideration. Flammable liquids and gases will be administratively controlled during decommissioning and conversion to prevent use or storage of substantial quantities of flammable liquids or gas near areas containing highly activated wastes. However, even if it were postulated that an explosion did occur near radioactive waste containers, this event would not produce consequences exceeding those analyzed in this section for a heavy load drop, tornado or fire. This conclusion is based on the relatively small size of the missiles resulting from such a postulated explosion, and the relatively large amounts of activity postulated to be released in the above mentioned accidents.

3.4.5 Heavy Load Drop Accident

The dismantling of the PCRV will be accomplished with the aid of three types of hoist systems. These systems include the main Reactor Building bridge crane, the auxiliary 17-1/2 ton hoist on the

bridge crane, and three 1-1/2 ton jib cranes on the refueling floor level. The Reactor Building crane will be re-reeved to allow the 170 ton main hook to travel from the refueling floor to ground level. An elevation view of the PCRV work area is shown in Figure 3.4-3. There will be many heavy loads removed during the dismantling process. These lifts include:

1. Large side reflector blocks.
2. Large concrete sections
3. Steam generators.
4. Helium diffusers.
5. Concrete Core Support Floor or CSF sections

The accident scenarios developed for heavy load drops in nuclear power plants consider the dropping of a heavy load (e.g., fuel shipping cask) on a very large radionuclide inventory such as fuel or spent fuel (Ref. 18). In the case of Fort St. Vrain, all fuel will have been removed from the Reactor Building prior to commencement of dismantling operations. Therefore, the full spectrum of heavy load drop accidents is much less severe than in an operational nuclear power plant.

The most severe heavy load drop accident is postulated to consist of dropping the component containing the largest inventory of dispersible radioactive material. Table 3.4-5 has been compiled to show the various components and their respective radioactive inventories. Sampling will be performed prior to waste movement to determine and verify the radionuclide composition and total Curie content. Review of this table indicates that the large side reflector blocks contain the largest radioactive inventory. The use of an entire large side reflector for this accident analysis is conservative since the predicted activity inventory exceeds the LSA Curie limit specified in 10 CFR 71, Table A-1, for Type A-2 waste containers.

The drop of a heavy load onto a highly radioactive component was evaluated and determined not to represent the worst case scenario. For instance, the dropping of one of the 240 large side reflector blocks back into the PCRV might crush portions of adjacent reflector blocks. However, since all highly radioactive components are kept under water unless they are being removed, the debris and its attendant activity would remain in the water. This activity would be cleaned up in the PCRV water cleanup and clarification system, described in Section 2.3.3.6 of this plan. Any "slosh" created by the block drop would drain back to the PCRV cavity or drain down inside the Reactor Building, eventually to the Reactor Building sump

and keyway, which have a capacity of approximately 350,000 gallons. These accident scenarios are bounded by the Loss of PCRV Shielding Water accident described in Section 3.4.7.

As discussed in Section 2.3.3.10, alternatives for removal of the 270-ton concrete CSF from the PCRV include sectioning it into pieces within the PCRV, and removing the pieces by means of the Reactor Building crane, or raising the entire CSF above the PCRV with specially installed high capacity jacks. Since the activated graphite blocks would have been removed from the PCRV prior to removal of the CSF, and since the CSF concrete is predicted to contain only 6 Curies of activity, a heavy load drop during this operation does not have the potential for release of significant quantities of radioactivity. If the entire CSF is raised by high capacity jacks, drop of the CSF is not considered credible since such an accident would require multiple jack failures.

3.4.5.1 Identification of Cause

A heavy load drop accident is a relatively low probability event. A failure of the hoisting cable could cause a drop of the load. In accordance with Reference 18, the probability of this event is on the order of 1.0E-5 to 1.0E-6 per demand (hoist lift). The loss of the crane brakes could be due to mechanical failure, operator error, or an incorrect maintenance operation. Since the Fort St. Vrain Reactor Building bridge crane does not qualify as a Single-Failure-Proof crane in accordance with NUREG-0554 (Ref. 19) guidelines, the loss of crane brakes is postulated as a credible failure mode.

3.4.5.2 Accident Description

For this accident it is postulated that the Reactor Building bridge crane is hoisting one of the 240 large side reflector blocks. It is currently planned to section these reflector blocks into smaller pieces for packaging in LSA shipping containers. However, it is conservative to assume that a single reflector block may be transported intact in its own shipping container.

After appropriate radiation surveys and removal of any surface contamination, the container with the single unsectioned side reflector block is lowered down the enlarged equipment hatch. Failure of the crane is postulated at this point. This results in the side reflector block container falling approximately 100 feet to the level of the truck loading bay. The shipping container ruptures, spilling its contents on the truck loading bay floor.

Administrative controls will be in place that will prevent the tractor of the tractor trailer from being in the loading bay during lowering of the container, and will ensure that all the truck loading bay doors are closed. It is conservatively assumed that one percent of the activity of a single large reflector block is dispersed from the drop. The dust is postulated to remain airborne and will escape the immediate area through the Reactor Building ventilation exhaust. Credit is taken for decontamination afforded by the Reactor Building ventilation system.

The Fort St. Vrain activation analysis (Ref. 2) indicates that the major contributors to the activity in these large side reflector blocks are Fe-55, tritium, and Co-60. The total activity in each of the large side reflector blocks has been calculated to be 1477 Curies. A one percent release for this scenario results in 14.77 Curies becoming airborne in the Reactor Building. Of this amount, 14.6 Curies are Fe-55, 0.06 Curies are tritium and 0.11 Curies are Co-60. These activities are based on a three year decay period. Credit is taken for a 95 percent filter efficiency for Fe-55 and Co-60. Tritium is released unfiltered (Ref. 12, Section 14.12). The major exposure path was assumed to be air inhalation to an adult standing at the 100 meter EAB.

The dose conversion factors in mRem per picoCurie inhaled were obtained from Regulatory Guide 1.109 (Ref. 20) and are as follows:

Isotope	Total Body	Lung
Tritium	1.58 E-07	1.58 E-07
Fe-55	4.93 E-07	9.01 E-06
Co-60	1.85 E-06	7.46 E-04

3.4.5.3 Analysis of Effects and Consequences

The whole body and lung doses to an individual standing at the EAB were calculated to be 4.66 mRem and 133 mRem, respectively. The whole body dose was 0.12 mRem from tritium, 4.41 mRem from Fe-55 and 0.13 mRem from Co-60. The lung dose was less than 1 mRem from tritium, 81 mRem from Fe-55, and 52 mRem from Co-60.

3.4.6 Fire

3.4.6.1 Identification of Cause

During decommissioning and repowering activities, there are many possible fire initiators that could result in a release of radioactive materials. These possible fire initiators include:

1. Fires started from cutting torches.
2. Contamination control tent fire.
3. Fires associated with component processing activities on the refueling level.
4. Electrical fires.

The most likely initiator has been determined to be a cable tray fire started from a spark during PCRV tendon cutting operations. The fire would be quickly extinguished by the fire watch on duty for the tendon cutting operations. The radiological consequence of this accident would be negligible since the cable trays contain virtually no radioactivity contamination.

The postulated fire accident involves a fire enveloping LSA waste containers. The greatest exposure for a fire accident to occur is during the approximate six month period when the highly radioactive large side reflector blocks and side spacer blocks are being removed from the PCRV.

Controls will be implemented prior to the storage of the LSA containers. LSA containers will be limited to groupings with no more than the equivalent Curie content of 230 side spacer blocks. Sufficient spatial separation will be imposed to preclude fire propagation to an adjacent group of LSA containers. The packaging of these boxes and/or drums is planned to be completed inside the Reactor Building. Temporary storage or staging of these containers prior to shipment is also expected. It is assumed that interim radioactive material storage will be available for up to 15 LSA boxes and 200 drums in the former Fort St. Vrain Fuel Storage Building.

Fire detection capability will be installed in the LSA container storage area prior to the storage of the LSA containers. There will be no uncontrolled combustible materials in this building. The controls defined above will be implemented prior to the storage of the containers to limit the grouping of LSA packages containing combustible materials. These controls will ensure sufficient spatial separation is available to preclude fire propagation to an

adjacent group of LSA containers and precludes the possibility of a fire with consequences greater than that which is analyzed.

3.4.6.2 Accident Description

For the fire accident it is postulated that a tractor trailer begins to transport packaged waste from the Reactor Building truck loading bay to an off-site burial ground/processing facility. The shipment is conservatively postulated to consist of 230 side spacer blocks with their boron pins removed. There are 1152 side spacer blocks to be removed during the decommissioning process.

It is postulated that an engine fire develops on the transport tractor and the fire spreads to the tractor's diesel fuel tanks. Based on work at the Waste Isolation Pilot Plant, the frequency of an unsuppressed truck fire is in the range of 1.0 E-4 to 1.0 E-5 per year (Refs. 21, 22). The tractor diesel fuel tanks may contain a combined capacity of up to 300 gallons of fuel. The fuel tanks are postulated to rupture from the heat and engulf the entire tractor trailer and the LSA containers in a diesel fuel pool fire. It is conservatively assumed that graphite side spacer blocks are enveloped by the diesel fuel fire.

A fire involving 300 gallons of diesel fuel spilled onto a relatively flat surface will burn out within thirty minutes. The resultant fire temperature will be bounded by the ASTM-E119 (Ref. 23) standard fire curve. Most of the graphite will be exposed to temperatures well below the fire temperatures due to insulation provided by adjacent graphite blocks and some protection afforded by the shipping containers.

Under these conditions, it is conservative to assume that 50 percent of the graphite inventory on a shipping trailer is oxidized during the 30-minute fire. It is assumed that all of the tritium in the oxidized fraction (50 percent of the total tritium inventory), is released. In addition to tritium release, it is assumed that 0.015 percent of the balance of the radionuclide inventory is released in the form of particulates (Ref. 24). The accident is assumed to occur at ground level immediately outside of the Reactor Building truck loading bay. The radioactive inventory for the 230 graphite side spacer blocks is calculated to be 3,706 total Curies. This total inventory consists of 3556 Curies of Fe-55, 122 Curies of tritium and 28 Curies of Co-60. Fifty percent of the tritium is assumed to be released (approximately 61 Curies). The additional release of the remaining radionuclides will be 0.534 Curies of Fe-55 and 0.0042 Curies of Co-60. The atmospheric dispersion factor, breathing rate

and dose conversion factors are the same as those used for the heavy load drop analysis.

3.4.6.3 Analysis of Effects and Consequences

The whole body and lung doses to an individual standing at the EAB were calculated to be 121 mRem and 215 mRem, respectively. The whole body dose was 118 mRem from tritium, 3 mRem from Fe-55, and less than one mRem from Co-60. The lung dose was 118 mRem from tritium, 59 mRem from Fe-55, and 38 mRem from Co-60.

3.4.7 Loss of PCRV Shielding Water Accident

3.4.7.1 Identification of Causes

During a portion of the Fort St. Vrain decommissioning, the PCRV cavity will be flooded with water. This water will be circulated and purified by the PCRV water cleanup and clarification system (Section 2.3.3.6) to gradually decrease the radioactivity in the water. This system is expected to be in operation during the period when the PCRV internals are being removed.

This accident scenario assumes that there is a leak or rupture of the PCRV water cleanup and clarification piping resulting in a liquid release due to a mechanical impact or a mechanical failure of a weld or flange.

3.4.7.2 Accident Description

This accident scenario assumes that a mechanical failure of the PCRV water cleanup and clarification system piping to the PCRV cavity occurs, resulting in a pipe rupture. Tritiated water with dissolved cesium, iron and cobalt would be spilled into the Reactor Building sump and keyway. Assuming the worst case (complete emptying of the PCRV), calculations indicate that 423,500 gallons could fill the Reactor Building sump/keyway, and flood the basement floor to a height of two feet. This water would be 49 feet below grade and would be contained by the Reactor Building sump/keyway and walls. No credit is taken for the Reactor Building ventilation system for this accident scenario.

Since the non-gaseous activities will be retained in the spilled water, tritium (released through evaporation) is the only significant activity available. This will be evaporated from the surface area of the spilled water in the Reactor Building basement.

The PCRV liquid release will not seep through the sump concrete seams as the water table is well above the 49 foot below grade level. To date, no known in-leakage of ground water has been observed into the Reactor Building sump.

The Reactor Building is approximately 120 feet long and 76 feet wide, which conservatively provides (neglecting equipment) a surface area for the spilled water of 9120 square feet (848 square meters). From Westinghouse Report WCAP 11002 (Ref. 25), the best fit evaporation rate at 70 percent relative humidity and wind speed of 1 m/sec is 0.046 g/m^2-sec or 0.046 cc/m^2-sec (assuming 1 gram = 1cc of water). It is predicted that tritium levels in the PCRV water will be less than 100 Curies. However, for this analysis, it is conservatively assumed that the theoretical maximum amount of tritium is transferred to the PCRV shielding water from the graphite blocks, which is approximately 1 E+5 Curies. Therefore, the tritium concentration in the spilled water is calculated to be 62.4 uCi/cc.

With an evaporation rate of 0.046 cc/m^2-sec and a tritium concentration of 62.4 uCi/cc, the tritium release rate is about 2.5 mCi/sec over the 848 square meters of surface area. Over a two hour period, 18 Curies would be released. For offsite dose analysis resulting from this quantity of tritium release, the same breathing rate, atmospheric dispersion factor and dose conversion factors as stated previously are used.

3.4.7.3 Analysis of Effects and Consequences

Since the dose conversion factor for tritium is the same for whole body and lung doses, the dose to an individual standing at the EAB was calculated to be 34.8 mRem for a two hour period.

3.4.8 Loss of Power

During the plant decommissioning, power will be normally supplied by off-site sources. No backup power is assumed available during a loss of power. The primary machinery using power during the decommissioning will be:

- Pumps:
  - Deionized Water System
  - Fire Water Pumps
  - Service Water Pumps
  - Water Treatment
  - PCRV Cleanup Water Pump
- Cranes
- Demolition Tools:
  - Plasma Arc Torch
  - Diamond-Wire Cutter
  - Water Jet Cutter
  - Drills
  - Mobile Laundry
  - PCRV Work Platform

Lighting:	HVAC:
Underwater Lighting	Ventilation Fans
Building	HEPA Filters/Fans
Plant Area	HEPA Vacuums/ Portable Cleaners

3.4.8.1 Identification of Causes

This accident postulates the loss of off-site power due to weather related events. Such events could include downed power lines due to strong winds or heavy icing conditions. The likelihood of this occurrence is remote since off-site power can be supplied to the site through six separate lines.

3.4.8.2 Accident Description

Loss of power would result in the loss of plant ventilation (HVAC) systems, lighting, plant water systems, and demolition power. Decommissioning activities would cease until power is restored.

Loss of power to the PCRV water cleanup and clarification pumps will not result in a radioactive release since the flow of bleed water to the evaporation ponds will be stopped (see Section 3.3.2.2 for a description of this process). While loss of ventilation will force personnel from radiological control areas, no off-site consequences are anticipated.

The postulated accident scenario is the loss of power to the HVAC while a large side reflector block has been removed from the PCRV for cutting. These graphite blocks will be grappled and hoisted by a jib crane to a refueling floor work station. At a work station a block will be cut into sections in preparation for packaging into LSA containers. The loss of power is assumed to occur after the cutting/cleaving operation.

It is assumed that these processing operations (kerfing debris) release 1.5 percent of the total activity of a single large side reflector block. It is conservatively judged that the combination of radiological controls in place at the work station (e.g., confinement through tenting) and the confinement function provided by the Reactor Building itself will result in retention of 99 percent of the Fe-55 and Co-60 kerfing debris in the Reactor Building. It is assumed that one percent of the Fe-55 and Co-60 in the kerfing debris and 100 percent of the tritium in the kerfing debris are released at ground level from the Reactor Building. No credit is taken for the Reactor Building ventilation system.

The total activity in each of the large side reflector blocks has been calculated to be 1477 Curies. A release of 1.5 percent of the radioactive material is assumed from the kerfing debris in each block. Of that amount, one percent of the Fe-55 and Co-60, and 100 percent of the tritium is released, resulting in a total of 0.31 Curies released to the environment. This total release consists of 0.219 Curies of Fe-55, 0.091 Curies of tritium and 0.0017 Curies of Co-60. These activities are based on a three year decay period.

The major exposure path was assumed to be air inhalation to an adult standing at the 100 meter EAB. The atmospheric dispersion factor, breathing rate, and dose conversion factors are the same as those used previously.

3.4.8.3 Analysis of Effects and Consequences:

The whole body and lung doses to an individual standing at the EAB were calculated to be 1.54 mRem and 40.0 mRem, respectively. The whole body dose was 0.18 mRem from tritium, 1.32 mRem from Fe-55, and 0.04 mRem from Co-60. The lung dose was 0.2 mRem from tritium, 24.2 mRem from Fe-55 and 15.6 mRem from Co-60.

3.4.9 Natural Disasters

For the effects of natural disasters, the following external initiating events were considered:

1. Earthquake

The Reactor Building is designed to withstand the Design Basis Earthquake of 0.10 g horizontal ground acceleration at the site without unsafe damage or failure to function. For decommissioning, it is required that the Reactor Building continue to perform its confinement function following a seismic event. The seismic qualification of the Reactor Building will be maintained during decommissioning. No other new or existing systems or equipment are required to function during or following an earthquake.

The most severe event which could result from a large earthquake is considered to be a drop of a radioactive waste container holding a highly activated graphite block (see heavy load drop accident). However, the simultaneous occurrence of an earthquake and the hoisting of a heavy load is not considered credible (a probability of less than 1 E-6 per year, from Ref. 18). The consequences of this simultaneous earthquake and heavy load drop scenario were not analyzed due to the low probability of such an event.

2. Tornado and Wind Effects

From Reference 12, Section 14.1.2, the basic design wind velocity for the plant is 100 mph. The equipment and structures exposed to wind load are designed to support design wind load combined with functional loads within the specified allowable stresses.

The tornado danger at the plant site is extremely remote. However, the Reactor Building was designed to withstand wind loadings developed by a tornado of 202 mph (total horizontal wind velocity) without exceeding yield stresses in the basic building structure. The Reactor Building was also designed to withstand a maximum tornado of 300 mph (total horizontal wind velocity) acting on the full area of all structures and a drop in atmospheric pressure of 3 psi within a period of 3 seconds, without exceeding ultimate stress levels in the main structural members. Above the 202 mph wind speed, the siding on the Turbine and Reactor Buildings above the turbine deck and refueling floor levels may be carried away, but the basic building structure will not collapse.

3. Floods

From Reference 12, Section 14.1.3, the plant site is protected from excessive runoff and flood by design of the yard drainage system. Grade level is approximately 17 feet above the highest observed flood level, and from 10 to 13 feet above the maximum probable flood level. The walls of the structures extending below grade level are watertight, and buoyancy effects were taken into account in their construction. Therefore, there will be no further consideration of accidents due to flooding during decommissioning activities.

4. Range Fire

The Fort St. Vrain site is located in an area of Weld county devoted to agriculture. The site itself is mostly surrounded by corn fields. Within the plant exclusion area is a fire buffer area consisting of maintained grass and ornamental landscaping. A 20 foot wide concrete pad rings the site. Therefore, a brush or range fire is not a credible accident during decommissioning activities.

3.4.9.1 Identification of Causes

The risks from a tornado at Fort St. Vrain during decommissioning are quite low for two reasons. First, the probability that a tornado will strike the site is diminishingly small. Second, the plant specific vulnerability to a tornado and its consequences are

also small. Unlike an operating nuclear power plant with active safety systems to contain large quantities of radioactive materials at high energy levels, all spent fuel will be removed from Fort St. Vrain and the PCRV will essentially be a passive container of radioactive material. Possible loss of power caused by a tornado is specifically analyzed in Section 3.4.8.

The Reactor Building roof and siding above the refueling floor are designed to withstand a tornado with a wind speed up to 202 mph. The probability of experiencing a tornado with wind speeds above 202 mph during decommissioning is extremely low based upon information and methodology provided in the draft Individual Plant Examination of External Events (IPEEE), NUREG-1407 (Ref. 26).

Based on the work of Abbey and Fujita (Ref. 27), the continental United States was broken down into 20 distinct tornado hazard regions. These regions were generalized into 4 broad areas shown in Figure 3.4-4, ranging from a highest risk in region A to the lowest risk in Region D. The Fort St. Vrain site is classified into Region C.

Reference 28 is used to establish the occurrence rate for different classifications of tornadoes. The National Severe Storms Forecast Center (NSSFC) national database for the years 1950 - 1978 was used as the basis for the occurrence rate analysis. The NSSFC data are categorized by Fujita intensity scales (F-scales). To predict the probability that a tornado with maximum windspeed will strike a nuclear power plant requires adjusting the F-scales for: tornado reporting trends, F-scale classification errors, path length intensity variation, and occurrence rates and windspeed relationships adjusted for intensity variation. The adjusted, or updated, tornado scales are denoted by "F′". Tornado wind velocities for the F- and F′- scales are compared as follows:

F-Scale	Maximum Windspeed Interval (mph)	F′-Scale	Maximum Windspeed Interval (mph)
F0	40 - 72	F′0	40 - 73
F1	73 - 112	F′1	73 - 103
F2	113 - 157	F′2	103 - 135
F3	158 - 206	F′3	135 - 168
F4	207 - 260	F′4	168 - 209
F5	261 - 318	F′5	209 - 277

The following evaluation demonstrates the low probability of occurrence of a tornado with wind velocity exceeding 202 mph at Fort St. Vrain, by comparing the frequency of occurrence of tornadoes in

Weld County with the NSSFC data. The occurrence rate of a F'4 tornado is 3.4 E-6/square mile/year (Ref. 28). According to the National Weather Bureau's historical data for Weld County from 1950 through 1987, there was only one tornado in the F3 range. That single F3 tornado is the only tornado in the vicinity of Fort St. Vrain of the 256 tornadoes recorded by NSSFC for all of Region C that had estimated windspeeds greater than 158 mph (Ref. 28). Based on this sample from the population, it can be inferred that the probability of a tornado at Fort St. Vrain in the F3 range is much less than 3.4 E-6/square mile/year.

The occurrence rate for a F'5 tornado in Region C is 3.5 E-7/square mile/year (Ref. 28). The National Weather Bureau's Weld County data show no tornado occurrence with intensity of F4 or greater. Thus, the 56 F4 and nine F5 tornadoes recorded by NSSFC all occurred outside the Fort St. Vrain area.

From this data, it can be concluded that the probability of occurrence of an F4 or greater tornado is less than 3.5 E-7/mi^2/yr. According to the draft IPEEE "Plants Designed Against NRC Current Criteria", these events pose no significant threat of a severe accident because the current design criteria for wind are dominated by tornadoes having a frequency of exceedance of about 1 E-7. The following section contains a specific accident analysis for a postulated tornado with winds less than 202 mph.

3.4.9.2 Accident Description

Temporary storage or staging of radioactive waste containers prior to shipment is expected. It is assumed that interim radioactive material storage will be available for 15 LSA boxes and 200 drums in the Fort St. Vrain Fuel Storage Building (Section 2.2.1.3). Calculations demonstrate that neither forces generated by 202 mph wind loading, nor the impact from the tornado-driven design basis missile, will result in breach of the walls or roof of this building.

In this scenario, it is assumed that a 202 mph tornado strikes the Fort St. Vrain site. At this lower wind level, the walls of the Reactor Building enclosing the PCRV will remain intact.

The tornado-driven design basis missile is a 12 foot x 12 inch x 4 inch thick fir plank, weighing 105 pounds, which impacts and penetrates the Reactor Building above the refueling floor level. It is assumed that this missile strikes and ruptures a container with 46 graphite side spacer blocks. It is conservatively assumed that

one percent of the activity in the container is dispersed and released to the environment. No filtration credit is assumed.

The total radioactivity inventory for the 46 side spacer blocks is approximately 741 Curies. This total inventory is comprised of 711 Curies of Fe-55, 24.4 Curies of tritium and about 5.5 Curies of Co-60. Assuming a one percent release results in 7.41 Curies released to the environment. These activities are based on a three year decay period. The major exposure path was assumed to be air inhalation to an adult standing at the 100 meter EAB.

The atmospheric dispersion factor used was an annual average Fort St. Vrain dispersion factor calculated for the 100 meter EAB (assuming ground level release), which is 4.59 E-4 sec/m^3. This is considered very conservative, since during a tornado or in the wake of a tornado the atmospheric dispersion factors would be much more favorable. The dose conversion factors and breathing rate used are the same as those stated previously.

3.4.9.3 <u>Analysis of Effects and Consequences:</u>

The whole body and lung doses to an individual standing at the EAB were calculated to be 0.58 mRem and 16.8 mRem, respectively. The whole body dose was 0.006 mRem from tritium, 0.558 mRem from Fe-55, and 0.016 mRem from Co-60. The lung dose was less than 0.01 mRem from tritium, 10.2 mRem from Fe-55 and 6.6 mRem from Co-60.

3.4.10 <u>Summary</u>

The results of the preceding accident scenarios, postulated for Fort St. Vrain decommissioning activities, indicate that the radiation exposures to the general public will be very low. These evaluations have determined that, in all cases, the radiological consequences at the 100 meter EAB are well within the 10 CFR 100 guidelines of 25 Rem whole body dose and 300 Rem to any specific organ. These doses are also a small fraction of the one Rem whole body dose and five Rem to any specific organ guidelines cited in the EPA Protective Action Guidelines (Ref. 14).

These scenarios are considered to have a low probability of occurrence and their radiological consequences bound other less severe accidents scenarios. Therefore, it is concluded that the Fort St. Vrain decommissioning activities do not pose any undue risk to the health and safety of the general public.

TABLE 3.4-1

SUMMARY OF ACCIDENT SCENARIOS

ACCIDENT	DESCRIPTION
Dropping of Contaminated Concrete Rubble	Rubble from PCRV top head concrete is dropped during processing.
Conversion Construction Near PCRV Dismantlement	Natural gas explosion/ crane falling.
Heavy Load Drop	Container drop to loading bay.
Fire	Truck diesel fuel pool fire.
Loss of PCRV Shielding Water	Pipe rupture in the PCRV water cleanup/clarification system.
Loss of Power	Release of graphite cutting debris from refueling floor work station.
Natural Disasters	Tornado-generated missile striking LSA waste container.

TABLE 3.4-2

DOSES TO AN INDIVIDUAL AT THE 100 METER EAB
DUE TO POSTULATED ACCIDENTS

ACCIDENT	2 HOUR DOSE (MREM) WHOLE BODY DOSE	ORGAN DOSE	
Dropping of Concrete Rubble	4.69	53.5	(bone)
Heavy Load Drop	4.66	133	(lung)
Fire	121	215	(lung)
Loss of PCRV Shielding Water	34.8	34.8	(lung)
Loss of Power	1.54	40.0	(lung)
Natural Disaster (Tornado)	0.58	16.8	(lung)

TABLE 3.4-3

CURIE TOTALS IN ACTIVATED PCRV CONCRETE
(3 YEARS DECAY-DATA FROM REFERENCE 2)

LOCATION	DEPTH	CURIES
Top Head Axial Up	1st 6 inches	9.83 E+1
	2nd 6 inches	2.56 E+1
	3rd 6 inches	2.52 E+0
	4th 6 inches	2.70 E-1
	5th 6 inches	3.68 E-2
	6th 6 inches	6.35 E-3
	7th 6 inches	1.31 E-3
	8th 6 inches	2.85 E-4
Radial	1st 6 inches	8.89 E+0
	2nd 6 inches	3.13 E+0
	3rd 6 inches	3.66 E-1
	4th 6 inches	4.10 E-2
	5th 6 inches	5.94 E-3
	6th 6 inches	1.08 E-3
	7th 6 inches	2.31 E-4
	8th 6 inches	5.22 E-5
Core Support Floor Axial Down	1st 6 inches	5.69 E+0
	2nd 6 inches	3.80 E-1
	3rd 6 inches	3.33 E-2
	4th 6 inches	3.60 E-3
	5th 6 inches	4.66 E-4
	6th 6 inches	7.67 E-5
	7th 6 inches	1.42 E-5
	8th 6 inches	3.08 E-6
	9th 6 inches	6.69 E-7
	10th 6 inches	1.25 E-7

TABLE 3.4-4

PERCENTAGE CONTRIBUTION OF ACTIVATION PRODUCTS
IN FIRST 6 INCHES OF TOP HEAD CONCRETE
(3 YEARS DECAY-DATA FROM REFERENCE 2)

SIGNIFICANT NUCLIDES	PERCENT OF TOTAL
H-3	2.89
Ca-41	0.05
Ca-45	0.18
Fe-55	89.29
Co-60	3.43
Cs-134	0.24
Eu-152	3.51
Eu-154	0.36
	99.95

98.3 curies total in 1.44 E+7 cc of top head concrete.

TABLE 3.4-5

WASTE VOLUME/ACTIVITIES
ESTIMATES FOR THE PCRV

(Based on a 3-year Decay Period)

ITEM/SYSTEM	NUMBER	TOTAL CURIES	CURIES/ ITEM
Region constraint device & pins	84	122	1.4
Metal clad reflector block - CR	37	23100	624
Metal clad reflector block - NCR	270	173000	640
Defueling blocks	1482	<0.01	/
Top reflector graphite blocks	589	2700	4.58
Bottom reflector graphite blocks	902	4000	4.43
Radial reflector hex graphite blocks - removable & permanent	396	3300	8.3
Large reflector blocks	240	354500 *	1477 *
Half-size reflector blocks	96	83700	872
Upper reflector keys (carbon stl)	24	0.0144	0.0006
Side spacer blocks (no rods)	1152	18550 *	16.1 *
Boron rods	309792	36800	0.12
Lower reflector keys (Hastelloy)	24	470	19.6
Core support blocks	61	120	2.0
Core support posts	183	36.5	0.2
Core support floor columns	12	1	0.08
Misc. steel from beneath CSF		2	/
Metal on large side reflectors	24	0.014	0.0006
Core barrel	1	8.4	8.4
Lower plenum insulation		<0.01	/
Silica blocks (25,000 lbs.)		250	
Concrete - top		130	
Concrete - CSF		6	
Concrete - side		12	
Misc. Inconel parts on CSF		15	
Hastelloy Cans	20061	3800	0.19
Concrete cutting debris - top		15	
Concrete cutting debris - CSF		0.45	
Concrete cutting debris - side		0.44	

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* These values are different than those values computed in the activation analysis (Ref. 2), as explained in Section 3.4.1.

TABLE 3.4-5 (Continued)

WASTE VOLUME/ACTIVITIES
ESTIMATES FOR THE PCRV

(Based on a 3-year Decay Period)

ITEM/SYSTEM	NUMBER	TOTAL CURIES	CURIES/ ITEM
Helium purifiers in PCRV head	10	0.9	0.09
Helium diffusers	4	20	5
Helium circ. shutoff valve assy	4	2	0.5
Helium bellows	12	20	1.66
Thermocouples & guide tubes		0.8	
Steam generators	12	5676	473
Lower floor appurtenances		2	
Platform/handling tools/jib cranes		<0.01	
Crane cable/drum/3 bucket inverters		<0.01	
Helium circulators	5	438	87.6
Orfice valves	37	415	11.2
Control rod drive assembly	44	233	5.3
Control rod absorber assembly	88	2.8	0.03
CSF Kaowool & Cover Plates		90	90
CSF Liner		142	142
Radial PCRV Liner		10	10
Top Cover Plates		5.7	5.7
Top Kaowool		<0.01	<0.01
Top Head Liner		105	105

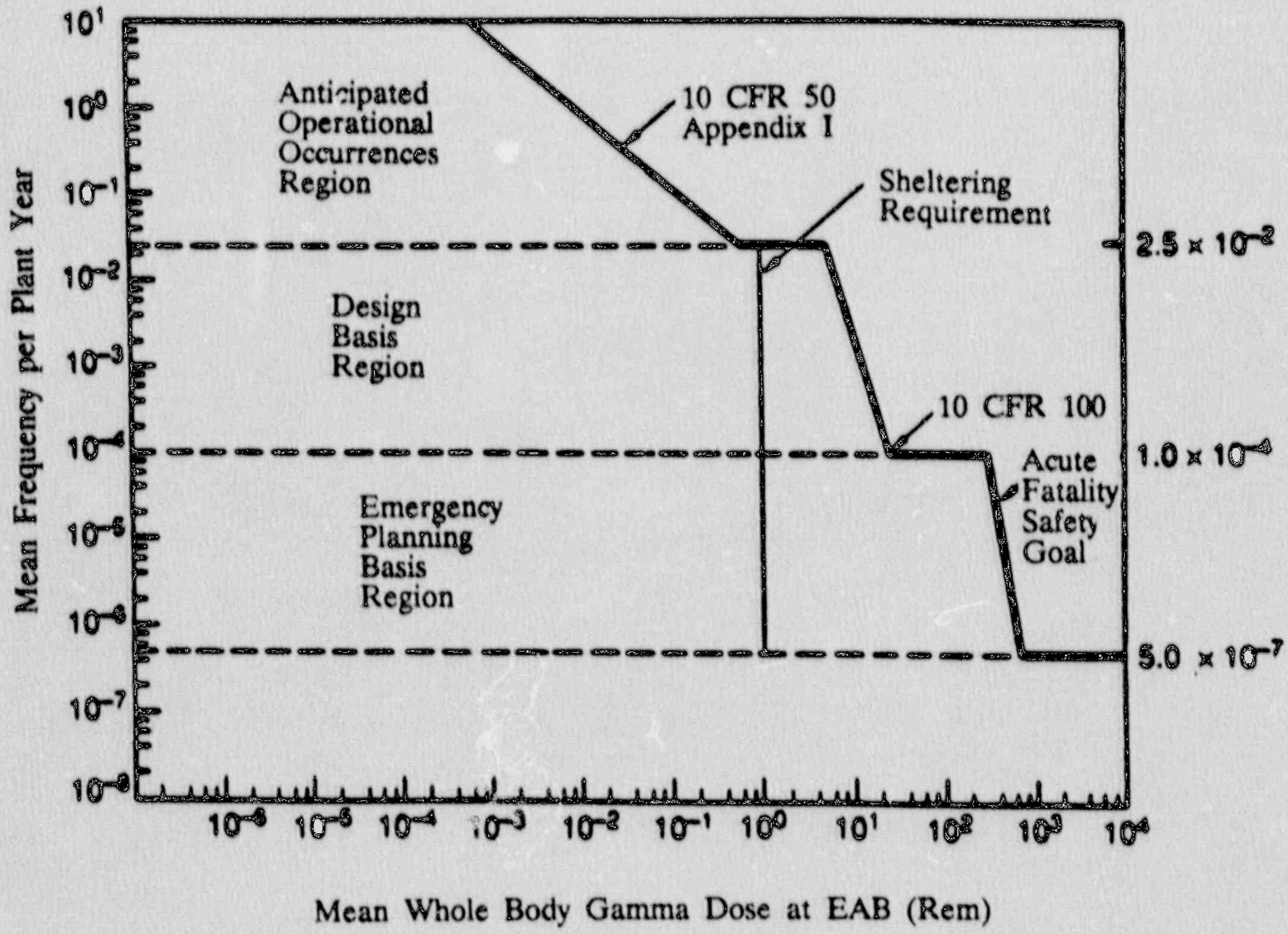


Figure 3.4-1 Whole Body Exposure Guidelines at the Exclusion Area Boundary (EAB)

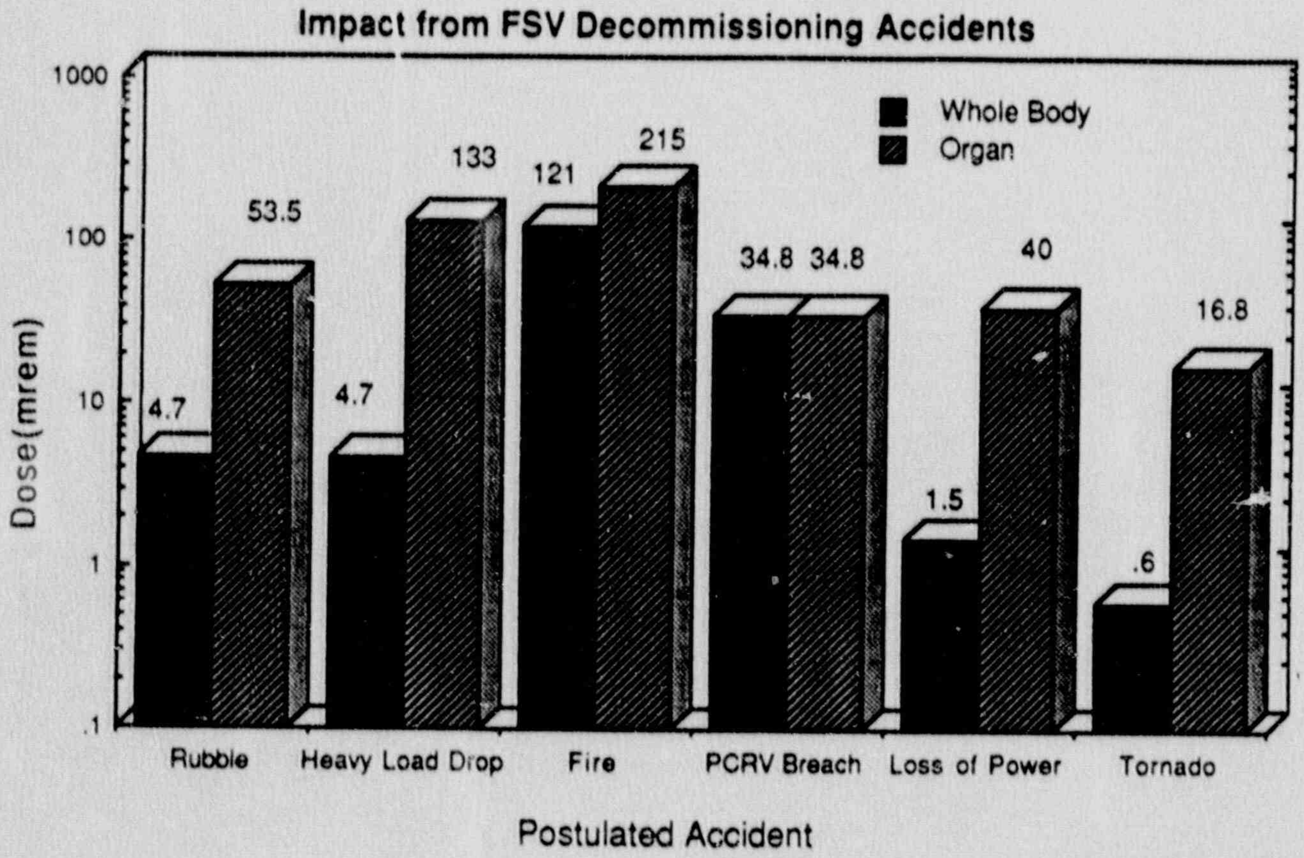


Figure 3.4-2 Dose Consequences from Fort St. Vrain Postulated Accidents

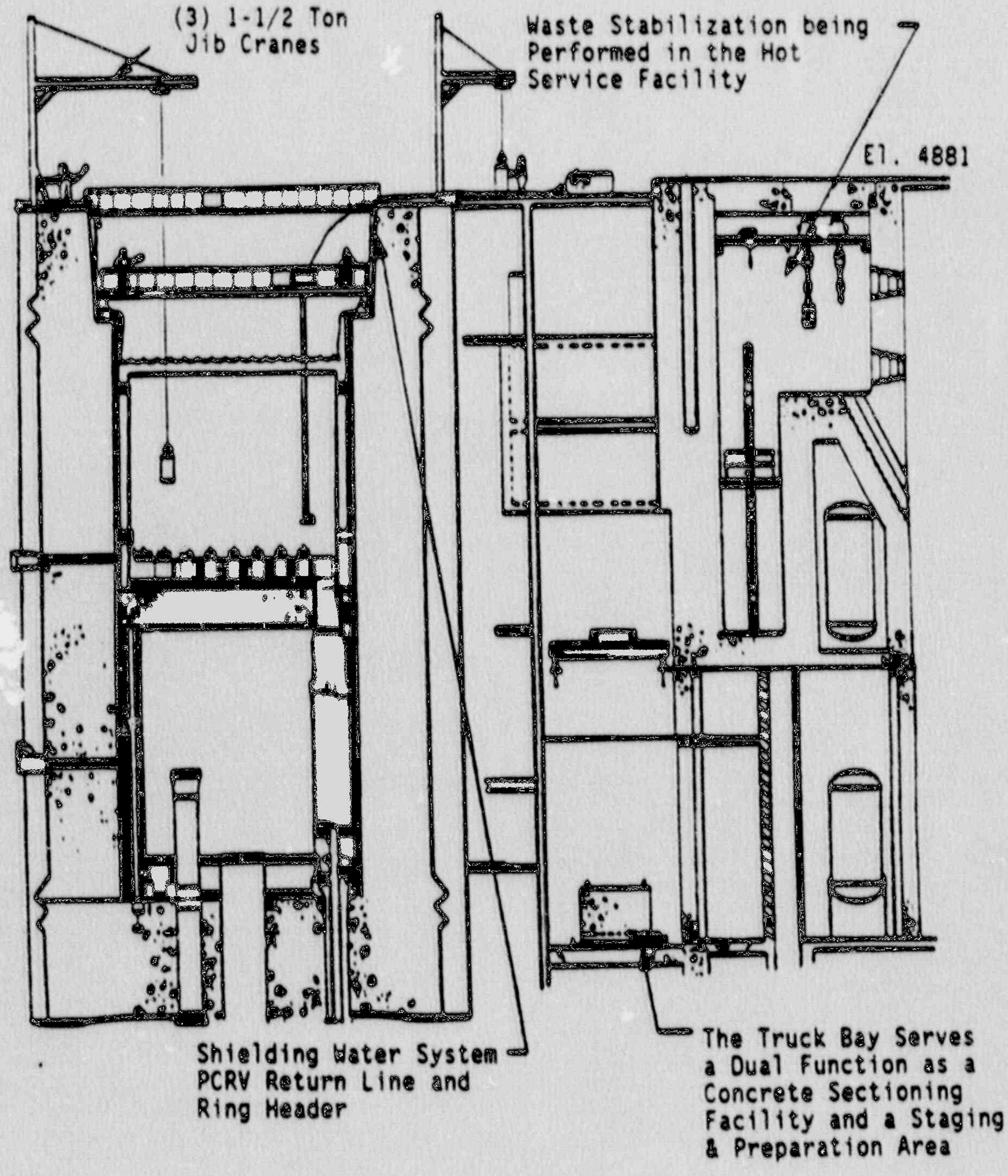
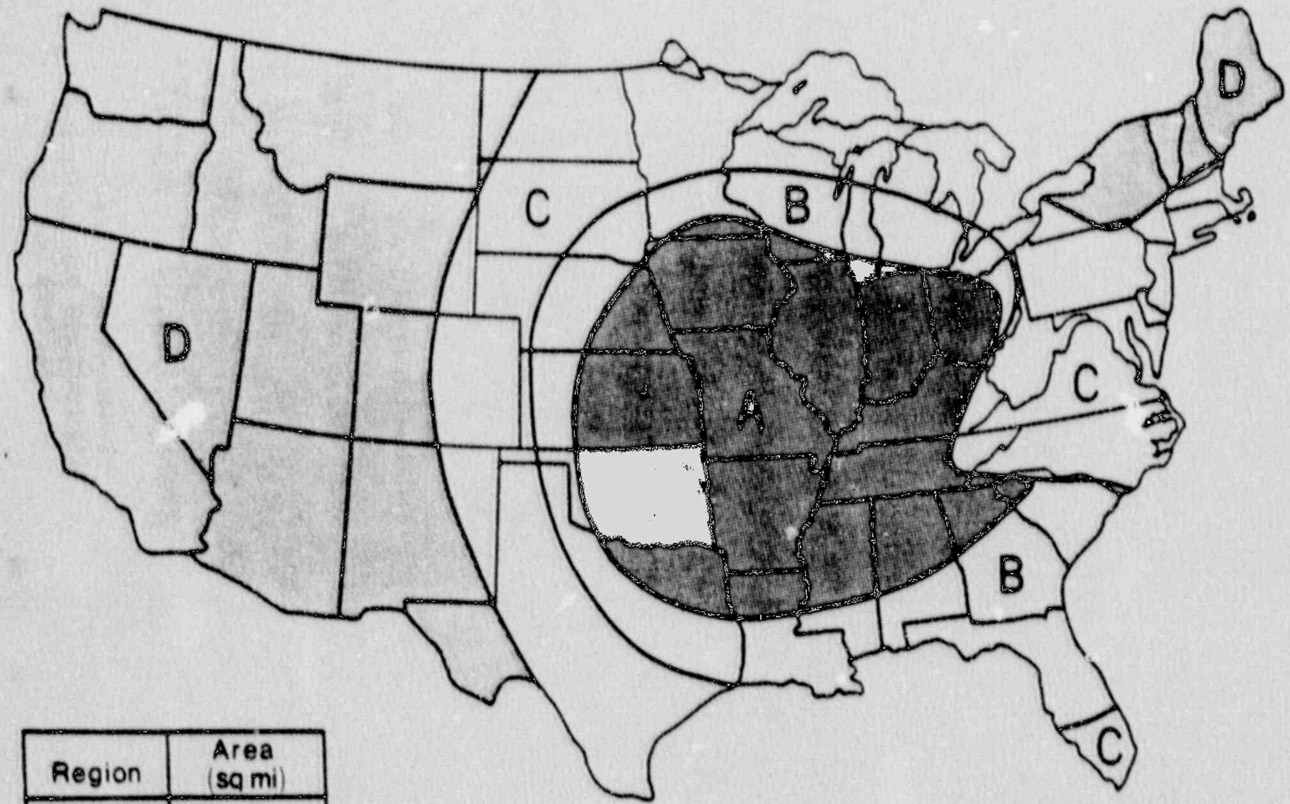


Figure 3.4-3 PCRV Work Area - Elevation View



Region	Area (sq mi)
A	625,628
B	365,180
C	775,569
D	1,205,117

Figure 3.4-4 Large Scale Regionalization for Tornado Risk Analysis

3.5 REFERENCES FOR SECTION 3

1. PSC letter, Crawford to NRC, dated April 23, 1990, (P-90139); Subject: "Fort St. Vrain Nuclear Generating Station Radiological Environmental Monitoring Program Annual Summary Report for 1989".

2. Engineering Evaluation, "Fort St. Vrain Activation Analysis," EE-DEC-0010, Rev. B, October, 1990.

3. Engle, W.W., "ANISN-P-Multigroup One-Dimensional Discrete Ordinates Transport Code with Arisotropic Scattering," Radiation Shielding Information Center, Oak Ridge National Laboratory, Oak Ridge, Tennessee.

4. Ebasco Services Incorporated, "REBATE - A Computer Program for Calculation of Decay Gamma Source Strength For One or Two Dimensional Gamma Transport Analysis," Ebasco Services Incorporated, New York, New York.

5. "Long Lived Activation Products in Reactor Materials," NUREG/CR-3474, August 1984.

6. PSC Internal Memo dated August 21, 1989, (NDG-89-1021), M. Fisher to O. Paez; Subject: "Dose Rate Estimates of the Steam Generator Lower Plenum Region."

7. GA International Services Corporation, Report 909658, "Fort St. Vrain Plateout Analysis for Decommissioning Study," Issue A, February 27, 1989 (GP-3282).

8. Hudritsch, W.W., "PADLOC, A One-Dimensional Computer Program for Calculating Coolant and Plateout Fission Product Concentrations," General Atomic Report GA-A14401, September 1981.

9. The As-Modified Three Party Agreement, Document Number 34426, Dated July 1, 1965.

10. DOE letter, K.R. Hastings (DOE) to R. Husted (PSC), dated May 11, 1988 (G-88163); Subject: "Modification to Contract at (04-3)-633: DOE Commitment to Receive FSV Spent Fuel".

11. PSC Letter, Crawford to Roberts (NRC), dated June 22, 1990 (P-90173); Subject: "Fort St. Vrain ISFSI License Application".

12. Fort St. Vrain Updated Final Safety Analysis Report, Revision 8, Public Service Company of Colorado.

13. Nuclear Safety, Volume 31, No. 2, April - June 1990.

14. "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents", EPA-520/1-75-001-A, U.S. Environmental Protection Agency, January 1990.

15. General Atomics Internal Correspondence, M.B. Richards to F. C. Dahms, "Tritium Source Terms in Fort St. Vrain Permanent Side Reflector and Spacer Block Graphite", dated October 10, 1990; attachment to General Atomics Letter GP-3487, dated October 11, 1990.

16. USNRC Regulatory Guide 1.145, "Atmospheric Dispersion Models for Potential Accident Consequence Assessments at Nuclear Power Plants," February, 1983.

17. "Age-Specific Radiation Dose Commitment Factors for a One-Year Chronic Intake," Battelle Pacific Northwest Laboratories, NUREG-0172, USNRC, November 1977.

18. "Control of Heavy Loads at Nuclear Power Plants," NUREG-0612, USNRC, July 1980.

19. "Single-Failure-Proof Cranes for Nuclear Power Plants," NUREG-0554, USNRC May 1979.

20. Regulatory Guide 1.109, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50," Appendix I, Revision 1, October 1977.

21. "Waste Isolation Pilot Plant Integrated Risk Assessment," DOE 89-10, June 1990.

22. "Special Analysis: Heavy Truck Fires, 1982-1986," National Fire Protection Association Fire Analysis and Research Division.

23. "Standard Test Methods for Fire Tests of Building Construction and Materials," ASTM E119-88.

24. Mishma, J. and Schwendiman; "Fractional Airborne Release of Uranium During the Burning of Contaminated Waste," BNWL-1730, April 1973.

25. Westinghouse WCAP-11002, "Evaluation of Steam Generator Overfill Due to a Steam Generator Tube Rupture Accident," February 1986 (proprietary).

26. Draft Individual Plant Examination of External Events (IPEEE), NUREG-1407, US NRC 1990.

27. Abbey, R.F., and Fujita, T.T.; "Regionalization of the Tornado Hazard, Tenth Conference on Severe Local Storms," American Meteorological Society, October 1977.

28. "Tornado Missile Simulation and Design Methodology, Volume 2: Model Verification and Data Base Updates", EPRI NP-2005, Volume 2, Project 616-2, Final Report, August, 1981.

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SECTION 4
FINAL RADIATION SURVEY PLAN

4.1 INTRODUCTION

The purpose of the final radiation survey will be to demonstrate the effectiveness of the decommissioning and to provide documentation that contaminated materials, structures, areas and components have been successfully removed/decontaminated to acceptable levels to permit release for unrestricted use. The final radiation survey to release the Fort St. Vrain site, facilities and installed equipment for unrestricted use will be performed following the completion of the decontamination and dismantlement activities. Materials and equipment determined to be free of radioactive contamination will be unconditionally released on an on-going basis.

All radiological surveys will be conducted in accordance with approved procedures using techniques that determine the effectiveness of a particular dismantlement and/or decontamination effort. These surveys will indicate when no further decontamination is needed and indicate that the equipment, area or structure has been prepared for unrestricted release.

This section describes the proposed methodology and criteria that will be used in performing the final surveys. This includes definition of residual radioactivity limits (including background evaluation), radiation survey methods, material release criteria and site release criteria.

4.2 FINAL RELEASE CRITERIA

The release of the site, facilities and materials remaining on site will be based on proper application of surface contamination, soil/water concentrations and exposure rate release criteria. While each criterion introduced below has been derived in a manner unique to its radiological category (concentrations, contamination or exposure), the basis for each criterion is the same as the objective of the decommissioning effort itself, to insure that the final disposition of Fort St. Vrain will not pose a significant threat to the general health and safety of the public and can be released for unrestricted use.

Criteria to allow release for unrestricted use for both loose and fixed surface contamination have been established in Regulatory Guide 1.86 "Termination of Operating Licenses for Nuclear Reactors" (Ref. 1). These limits for acceptable surface contamination levels

were established in 1974 and are currently accepted as practical criteria when considered in light of the maximum sensitivity of commercially available portable radiation survey equipment. All final surveys for surface contamination on materials, equipment and structures at Fort St. Vrain to be released for unrestricted use shall be based on this criteria.

While no formal criteria exist that establish an acceptable level of direct exposure, the NRC has provided interim guidance which directs licensees to use a limit of 5 microR/hr above background (at one meter) for reactor-generated gamma emitting isotopes as a limiting level for direct exposure from "residual" radioactivity (Ref. 2, 3, 4). This recommended limit of 5 microR/hr is also consistent with statements within NUREG-0586, "Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities" (Ref. 5).

While this criteria will be of use for certain unique evaluations, it is expected that the Regulatory Guide 1.86 criteria will be the most restrictive for the majority of material, equipment and facility release for unrestricted use.

In February 1990, the NRC released NUREG/CR-5512 "Residual Radioactive Contamination from Decommissioning" (Ref. 6) for comment. In this report, a generic pathway model is used to derive the potential total effective dose equivalent (TEDE) to an individual in a given population group from unit radionuclide concentrations of residual contamination. In consideration of this document, the effective criteria for the total concentrations of radioactive materials above background in soil and water will be based upon those established in NUREG/CR-5512. The use of these concentrations (or methodology used to obtain these concentrations) will ensure an average total effective dose equivalent of less than 10 mRem/yr to an individual in a given population group.

Equipment and materials found to be free of radioactive contamination as described in NRC Circular 81-07 (Ref. 7), "Control of Radioactively Contaminated Materials" and NRC IEN 85-92 (Ref. 8), "Surveys of Wastes before Disposal from Nuclear Reactor Facilities" will be unconditionally released. Equipment and material that are found to be contaminated and cannot be decontaminated will be handled as radioactive waste. These contaminated materials will be packaged and shipped in the most cost-effective way to a radwaste volume reduction facility or to a burial site for final disposition.

4.3 SURVEY METHODOLOGY

The survey methodology provides the framework for the design of survey techniques and procedures to accomplish the objective of demonstrating that the Fort St. Vrain site meets all applicable radiological criteria prior to its release for unrestricted use.

The final radiation survey will be performed after dismantlement/decontamination have been completed and will be based on categorizing portions of the plant and site into areas where a high, medium or low probability will exist of finding measurable amounts of residual radioactivity.

Areas with a high probability of residual activity will include such areas as the PCRV, fuel storage facility, HSF and radwaste compacting building. Surfaces in these areas will be systematically surveyed.

Statistical methods, described in NUREG/CR-2082, "Monitoring for the Compliance with Decommissioning Termination Survey Criteria" (Ref. 9), will be used to determine systematic, stratification or random survey techniques. The initial site characterization survey (See Section 3.1.5), decontamination surveys during decommissioning, and routine health physics surveys will be used to determine those plant areas in which there will be a high, medium, or low probability of finding residual radioactivity.

Areas with a medium probability of residual activity will typically include balance of plant areas (where contaminated equipment had been removed), ventilation systems, and contaminated equipment storage. A stratification survey technique will be used in these areas. Floors and walls up to two meters above the floor will be surveyed systematically. Surveys of the ceiling and remaining wall surfaces will employ random survey techniques, since the entire area will have been previously decontaminated and will have a low probability of being contaminated.

Areas with a low probability of residual activity will include such areas as the ground and structures outside the reactor building, roof, and walls of the reactor building above the operating floor, and other working areas inside the plant. Surveys of these areas will employ random survey techniques.

4.3.1 Preliminary Survey

The elements of a preliminary survey program have been incorporated into the site characterization study (See Section 3.1.5). Data obtained from the site characterization study, reviews of historical radiological data and on-going radiological surveys will be utilized to develop the final radiation survey plan. This approach will provide sufficient data to preclude the necessity of developing a separate preliminary survey.

This approach will provide the level of detail necessary to determine the appropriate surveys, analyses and logical division of the site into separate survey units or grids (See Section 4.3.3).

4.3.2 Background Determination

Background levels of radiation will be determined principally by taking radiological measurements at an area (or areas) remote enough to be beyond any detectable influence of the plant, but close enough to the plant to be representative. Background measurements will include both "instrument background" and naturally occurring radioactive materials including enhanced background radiation levels due to fallout. Efforts will be made to find a site and structure that meet the above conditions and approximate the physical characteristics of Fort St. Vrain. The sampling scheme (sample locations, number of samples, etc.) will be based on guidance from NUREG/CR 2082 (Ref. 9).

The sampling methodology to be used when determining the independent radiological background will be based upon collecting multiple samples of soil and direct instrument readings. Since background levels may vary from point to point, each type of background sampling will be statistically analyzed to determine if a single numerical representation of the background type will be valid. For example, it is expected that background gamma dose rates at all elevations inside buildings will be statistically equivalent to the background gamma dose rates at ground level in the buildings. If statistical differences in background levels are found at some elevation (or area), different background levels will be assigned to those areas. Statistical analyses of data, including treatment of anomalies, will be performed based on the guidance of NUREG/CR 2082 (Ref. 9).

Radiological background types that will be evaluated include:

1. Direct surface beta, gamma and alpha contamination.
2. Direct gamma exposure rate readings on contact with the surface.
3. Direct gamma exposure rate readings at a fixed distance (one meter) from the surface.
4. Surface soil contamination.
5. Sub-surface soil contamination.

As part of the background characterization study, the minimum detectable activity (MDA) of the instrumentation will also be evaluated to ensure that the instrumentation is sensitive enough to respond to levels as specified in the final release criteria. NRC Circular 81-07, "Control of Radioactively Contaminated Materials" (Ref. 7) and NRC IEN 85-92, "Surveys of Wastes before Disposal from Nuclear Reactor Facilities" (Ref. 8) provide guidance for the determination of the MDA of the survey instrumentation.

The effects of concrete and other shielding (building geometry) within the Fort St. Vrain facility that lower the background dose rate relative to the remote area readings will also be addressed and evaluated. Water and soil samples will also be taken at the remote location(s) for background evaluation.

Results of this study will be documented and the formal report and final interpretation will be the basis for background baselines.

4.3.3 Grid Survey Technique

To assure that all areas of a surface are adequately surveyed, a rectangular or other appropriate geometric grid will be superimposed on all surfaces being surveyed. The grids may be physically marked on the surfaces or, as a minimum, the grid corners will be labeled. The primary purpose of the grid is to aid in repeatability of measurements in the event that further evaluation of data is necessary.

The grid dimensions will vary from one to three meters on a side per grid for indoor areas and certain outdoor areas (such as rooftops) and from three to fifty meters on a side per grid for soil and equipment lay-down areas. The soil grid will be laid out using stakes as markers to define grid patterns. Radiation survey maps will be developed and included in the procedures for radiological survey.

Detailed development of grid survey techniques and procedures will be based upon guidance from NUREG/CR-2082 (Ref. 9).

4.3.4 Special Surveys

Final survey plans are typically based on the assumption that the majority of the original equipment will be removed as part of the decommissioning project. Decommissioning of Fort St. Vrain is unique in that the final survey program will include the release for unrestricted use large amounts of equipment and materials that will be re-used following the conversion of the facility or left in place. Electrical conduits, pipes, drains, equipment, and associated support equipment will require different survey methodology than a formal grid survey methodology. For these types of surveys, special techniques will be developed.

Due to the large amount of equipment and materials planned to remain in place in the Reactor Building, special surveys will not encompass 100% of all piping, conduits or systems on site. For most secondary systems, this approach will be warranted due to the operational history of the facility and past operational surveys. In general, the number and type of measurements will be based on the accessibility and the probability of contamination for a particular area, system, or equipment. It is expected that the site characterization survey and on-going surveys during the decommissioning will define the extent of special surveys.

Techniques and procedures will be developed to ensure proper surveys of all equipment and material types (motors, vessels, piping, etc.). Equipment or material found to be above the release criteria levels specified in Section 4.2 will be decontaminated or dismantled for disposal.

4.4 INSTRUMENTATION

Instrumentation to be used for the final site survey will be of such types and ranges to ensure that measurements can be performed within the final release criteria limits.

Portable field instruments will be chosen for their sensitivity, durability, ease of use, accuracy, and portability. This class of instruments will typically include:

1. Ratemeters with thin window GM tube detectors ("pancake" Type) sensitive to gross beta radiation.
2. Ratemeters with scintillation or air proportional detectors

sensitive to gross alpha radiation.
3. MicroR meters sensitive to gross gamma radiation.
4. Ratemeters with scintillation detectors sensitive to gross gamma radiation.
5. Portable multichannel analyzer with HPGe or GeLi detector for field gamma spectral analysis.
6. Portable scaler(s) with detectors sensitive to alpha, beta and or gamma radiation.

Laboratory instruments will also be chosen for their sensitivity, durability, ease of use, accuracy, and stability. This class of instruments will typically include:

1. Multichannel analyzer with HPGe or GeLi detector(s) for gamma spectral analysis.
2. Liquid scintillation counter with adjustable window(s).
3. Scaler(s) with scintillation or gas flow proportional detector sensitive to gross alpha radiation.
4. Scaler(s) with GM or gas flow proportional detector sensitive to beta-gamma radiation.

Instruments will be calibrated, maintained and repaired in accordance with procedural requirements. Calibration sources to be used for calibration of both field and laboratory instrumentation will be traceable to National Institute of Standards and Technology (NIST) or equivalent standards. Procedural guidance will also be provided for a quality assurance and control program for all instruments used as part of the final survey plan.

4.5 DOCUMENTATION

Survey data will be presented in a manner that will allow the final radiological condition of the site to be completely and accurately depicted. This will allow parties to ascertain the radiological condition of the site without further analysis of the data. Clear and accurate documentation will be provided to ensure acceptable agreement between the final survey, independent verification survey (Section 4.7), and the NRC confirmatory survey.

4.5.1 Survey Documentation

Procedures will be developed to provide guidance in the documentation of measurements and analytical results. Survey maps will be used when considered appropriate. or survey information will be documented on survey forms. Information that will typically be included on the survey maps or forms is:

1. Location of the measurement or sample.
2. Date and time of the measurement or sample.
3. The name of the surveyor, sampler or analyst.
4. Description and purpose of survey or sample.
5. Description of sampling equipment, including calibration dates.
6. Analysis date and time (if applicable).
7. The analytical error (if applicable).
8. Units of measurement or analysis.
9. Unique conditions pertaining to the survey or analysis.

All original survey data shall be retained and placed in PSC archives at the termination of the project.

4.5.2 Radiological Survey Report

At the completion of the decommissioning effort, a radiological survey report will be developed to document the findings and conclusions of the final survey. This report will provide the basis for securing approval for the termination of the 10 CFR 50 license.

The radiological survey report will contain an overview of the radiological condition of the site and structures, a detailed presentation of the data in the form of tables and figures, and interpretation of results relative to the decommissioning release criteria. It will also describe the residual radioactivity in the remaining structures and systems to characterize the final facility and site radiological condition.

4.6 QUALITY ASSURANCE

The objective of quality assurance, as applied to the final radiation survey plan, will be to ensure confidence in the sampling, analysis, interpretation and use of the data generated from the final survey. Quality assurance for the final radiation survey plan will be an integral part of the overall decommissioning QA plan and will be governed by Section 7 of this plan.

4.7 INDEPENDENT VERIFICATION

A third-party independent verification of the final survey will be performed as an audit of the final survey plan. This independent verification will include selected measurements, sampling and analysis as required to confirm validity of the final survey.

The independent verification program will also require formal program development to remove possible judgmental factors and prevent skewing of the final results. The independent verification program will be of similar structure (although on a smaller scale) as the final survey plan.

4.8 REFERENCES FOR SECTION 4

1. Regulatory Guide 1.86: "Termination of Operating License for Nuclear Reactors". June 1974.

2. NRC Memorandum P.B. Erickson (NRC) to Seymour H. Weiss (NRC); Subject: "Summary of Meeting with Public Service Company of Colorado (PSC) To Discuss Preliminary Decommissioning Plan of June 30, 1989," dated August 24, 1989.

3. NRC letter, John F. Stolz (NRC) to Dr. Roland A. Finston (Stanford), dated March 17, 1981.

4. NRC letter, James R. Miller (NRC) to Dr. Roland A. Finston (Stanford), dated April 21, 1982.

5. NUREG-0586: "Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities." August, 1988.

6. NUREG/CR-5512: "Residual Radioactive Contamination from Decommissioning." Draft Report. January, 1990

7. NRC Circular 81-07: "Control of Radioactively Contaminated Material." May, 1981.

8. NRC Information Notice 85-92: "Surveys of Wastes Before Disposal from Nuclear Reactor Facilities." December, 1985.

9. NUREG/CR-2082: "Monitoring for Compliance with Decommissioning Termination Survey Criteria". (ORNL/HASRD-95). June, 1981.

SECTION 5
DECOMMISSIONING FIXED PRICE AND FUNDING PLAN

5.1 DECOMMISSIONING FIXED PRICE

As noted in Section 2.1, PSC has selected the DECON option for early decontamination, dismantlement, and decommissioning of the radioactive portions of the Fort St. Vrain Nuclear Generating Station. In order to accomplish this project, PSC released a Request for Proposal to several highly qualified companies for the purpose of receiving competitive bids on the project. Four qualified bids were received and, based on a thorough evaluation for technical and financial acceptability, PSC selected a project team of Westinghouse and MK Ferguson to decommission Fort St. Vrain, with Westinghouse as the lead contractor. PSC is currently negotiating the final contract for the decommissioning work with the Westinghouse team.

The selection of the Westinghouse team as a part of the competitive bids resulted in a total cost of $137,129,000 for the decommissioning of Fort St. Vrain, inclusive of escalation and PSC expected costs. The following table provides a breakdown of the project costs based on the major decommissioning activities:

DECOMMISSIONING ACTIVITY	TOTAL COST
Planning/Preparation	$23,613,000
Decontaminate/Dismantle	96,621,000
Package, Ship & Burial Cost	15,715,000
Final Radiation Survey	1,180,000
TOTAL COSTS	$137,129,000

Estimated annual decommissioning expenditures are identified in Table 5-1, in future value dollars.

5.2 DECOMMISSIONING COMPETITIVE BID PROCESS

The use of a firm fixed price contract greatly reduces the level of uncertainty of the decommissioning cost. By use of the competitive bid process, an accurate method has been utilized to determine the ultimate cost for decommissioning. The bid process and resulting contract commits both PSC and the Westinghouse team for the project scope and cost.

Certain restrictions and limitations exist when only a cost estimate has been prepared as a basis for evaluating decommissioning costs and as a basis for the decommissioning funding plan. A cost estimate is limited in that it is only a study to determine reasonable estimates of individual costs and involves no commitment on the part of the cost estimator to meet the estimate during the actual performance of the work. A firm fixed price contract goes beyond this phase, in that a contractor is bound under a contractual obligation to perform this established scope of work at the price they have bid.

Receiving bids from four qualified bidders is equivalent to receiving four independent cost estimates. Since each bid utilized a different decommissioning methodology, this approach exceeds any regulatory guidance for financial assurance and is beyond that required by the Decommissioning Rule.

In evaluating the four bids, detailed assessments of the actual decommissioning work and methodology were conducted to ensure that the bidders had adequately identified and accounted for the work to be performed. Detailed evaluations and cross comparisons were also conducted to ensure that the bidders had adequately addressed technical support requirements, project management and control, radiological waste handling, radiation protection, facilities and support requirements, quality assurance and project documentation and closeout. Areas of uncertainty were identified and clarified with the bidders, including evaluations of pricing contingencies regarding waste volumes, contamination levels, etc. The use of this competitive bid process, the high quality of the responses received and the detailed bid evaluations that were conducted, provides significant confidence in the cost estimate as well as the overall decommissioning approach and work scope. Therefore, PSC is confident that all major tasks have been identified and included within the Westinghouse team fixed price.

Since the basis for the cost is predominately a firm fixed price, it is unnecessary to provide detailed tabulations of staff-years, labor rates, inflation rates, number of waste containers, etc., as is normally found in a decommissioning cost estimate. This section outlines the major cost categories for PSC and the Westinghouse team.

In order to provide the NRC with assurance of the adequacy of the cost to decommission Fort St. Vrain, PSC will submit to the NRC a copy of the signed and executed contract when available. This

contract will define in detail the scope of the contract along with the division of responsibilities.

5.3 MAJOR ASSUMPTIONS, BASES, AND SCOPE OF FIXED PRICE CONTRACT

The following information is provided to identify the basis of the fixed price contract between PSC and the Westinghouse team to decommission Fort St. Vrain. A detailed breakdown of the Westinghouse team proposed scope of work is provided in Appendix 1 of this plan. The following major work activities and necessary support activities will be performed:

1. Decontaminate in place, and/or remove and decontaminate, and/or remove and dispose of the contaminated and activated materials inside the PCRV and those that form the PCRV structure.

2. Decontaminate in place, and/or remove and decontaminate, and/or remove and dispose of the contaminated portions of the plant systems outside of the PCRV.

3. Survey and cleanup the site as required, including the evaporation ponds and effluent blowdown flow paths.

Decontamination and decommissioning activities will be performed to the extent necessary to decontaminate all radioactive portions of the plant to the final release criteria specified in Section 4.2 of this plan. All other materials remaining as part of the PCRV structure, in the systems outside of the PCRV and on the site after the final radiation survey will be confirmed to be below these release limits and will remain on-site.

As noted in Section 2.4, PSC is responsible for overall project management and licensing interface with the NRC. Major PSC responsibilities (and associated costs) include:

1. Overall control of the project
2. Access control
3. Radiation protection overview
4. Quality assurance overview
5. Licensing coordination
6. Operation and maintenance of required plant systems
7. Responsibility for the final independent radiation survey
8. Engineering configuration control overview

The following are major assumptions included in the basis of the firm fixed price:

1. The current facility design and layout is as described in Section 2.2 and shown in Figure 2.2-1, and no major modifications are anticipated.
2. Radionuclide inventories, activation analyses, and estimated dose rates are as described in Section 3 of this report.
3. Inflation is estimated and included in the Westinghouse team firm fixed price. Consumer Price Index (CPI) inflation factors are applied to PSC costs to adjust for escalation for the project duration. The timing of the project assumes commencement of site work in early 1992 and project completion in mid 1995.
4. PSC will supply utilities to the contractor including electric power and water and the cost for these utilities is included in PSC's cost.
5. No mixed wastes exist.
6. Burial charges are based on the current disposal rates in affect at the Beatty NV disposal site until the end of 1992. Disposal costs have been adjusted for burial of radioactive waste at the Richland WA disposal site after 1992.
7. No cost allowances were included for major schedule delays caused by uncontrollable and unforeseen events. Appropriate contingencies are included to account for project uncertainties.
8. Existing plant equipment will be utilized when determined to be cost effective and technically sound to operate and maintain.
9. Steam generators will be shipped offsite and disposed as complete units.
10. No radioactive contamination exists on site work areas outside the reactor building.
11. Costs associated with plant closure activities are not included in the cost of decommissioning activities.

PSC and the Westinghouse team will continue to validate these assumptions during the planning phase. Where necessary, appropriate contingency plans will be identified.

5.4 DECOMMISSIONING PRICING BREAKDOWN

The Westinghouse team firm fixed price was derived in conjunction with preparation of the detailed Work Breakdown Structure. Table

5-2 summarizes the upper tier of tasks developed for the decommissioning project for both Phase I and II. The tasks are categorized into two phases. Phase I includes all of those actions associated with the planning and engineering of the project. Phase II includes those actions involved with implementation of the work. The specific activities involved in each phase may overlap in calendar time. An outline of each of the specific activities involved in a task is outlined in Appendix I and is discussed in detail in Section 2.3.

Consistent with the guidance of Regulatory Guide DG-1003 (Ref. 1), waste disposal costs are summarized in Table 5-3. The volumes of these materials can be found in Section 3.3. Burial costs are based on waste burial at Beatty, Nevada and reflect current rates for that facility. Within the overall cost estimate, PSC has included those additional costs that will result due to waste disposal at the Richland WA disposal site, following closure of the Beatty NV disposal site.

5.5 DECOMMISSIONING FUNDING PLAN

As of September 30, 1990, the Fort St. Vrain decommissioning trust fund balance was approximately $19.8 million. Under terms of the 1986 Settlement Agreement, funds in the amount of approximately $2.5 million remain to be collected from PSC customers by the end of 1991.

A final decision has not been made, however, on the funding plan for Fort St. Vrain decommissioning. Discussions are underway between PSC, the Westinghouse team, regulatory agencies and other interested parties, to evaluate options for repowering Fort St. Vrain as a conventional fossil fueled generating unit. Several activities, including a comprehensive resources generation study, are underway which are necessary prerequisites to the eventual funding plan to decommission Fort St. Vrain.

The following organizational options are being considered and the final result will have bearing on the exact nature of the decommissioning funding plan:

1. Converted plant included in rate base
2. Converted plant out of rate base, with fixed price for generated power
3. Independent Power Producer (IPP)
4. PURPA Qualified Facility

PSC is confident that with each of these four options, adequate funding of decommissioning, along with repowering of the plant, will be achieved. When these negotiations are completed, PSC will notify the NRC of the projected plan to accomplish funding for the Fort St. Vrain decommissioning. Until the DECON funding plan is submitted for NRC review and approval, PSC will continue to maintain the SAFSTOR option for backup purposes and will maintain the level of funding previously committed to the NRC in Reference 2, the updated SAFSTOR Financial Plan.

5.6 UPDATES TO THE DECOMMISSIONING FUNDING PLAN

Per the requirements of Regulatory Guide DG-1003 (1990), PSC and the Westinghouse team will review the projected cost for decommissioning once a year. The decommissioning price will be adjusted for any changes in projected inflation rates, as well as any changes in or effects of force majeure events on project scope which may revise the overall price of decommissioning. Adjustments to the decommissioning cost due to technological and status changes, or major project scope changes will be made according to the changes experienced. Based on these annual reviews of decommissioning price, the decommissioning funding plan will also be reviewed and revised accordingly.

Since the project is scheduled for completion within 39 months after commencement of physical dismantlement and decommissioning activities, adjustments will be made as frequently as deemed necessary for successful funding of the project. The NRC will be informed of any changes exceeding (plus or minus) 15 percent to either the decommissioning price or the decommissioning funding plan.

5.7 REFERENCES FOR SECTION 5

1. USNRC Draft Regulatory Guide DG-1003, "Assuring the Availibility of Funds for Decommissioning Nuclear Reactors," September 1989.

2. PSC letter, Crawford to Weiss, dated February 15, 1990 (P-90039).

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TABLE 5-1

ESTIMATED ANNUAL DECOMMISSIONING EXPENDITURES

(Future value dollars escalated to the date of expenditure)

YEAR	PSC	WESTINGHOUSE	TOTAL
1990			$ 4,656,000
1991			18,957,000
1992	[PROPRIETARY]		34,991,000
1993	[ ]		35,537,000
1994	[DATA]		29,312,000
1995			13,676,000
TOTAL	36,669,000	100,460,000	137,129,000

TABLE 5-2
FORT ST. VRAIN
DECOMMISSIONING & DISMANTLEMENT
COST BREAKDOWN

(Escalated Future Values)

1. Project Management & Support	[PROPRIETARY]
2. Engineering	[ ]
3. Common Facilities & Services	[DATA]
4. PCRV Dismantling & Decontamination	
a. Initial Preparations and Dissassembly	
b. Shielded Access	
c. Dismantle Core	
d. Remove Core Support Floor, Barrel and Insulation	
e. Dismantle & Decontaminate Lower Plenum	
f. Final PCRV Dismantlement and Cleanup	
5. Dismantle & Decontaminate Contaminated Balance of Plant Systems	
6. Site Clean-up	
7. Waste Preparation, Packaging, Shipping, and Disposal	
PROJECT TOTAL	$100,460,011

TABLE 5-3

RADIOACTIVE WASTE
PACKAGING, SHIPPING & DISPOSAL COSTS
(Escalated Future Values)

WASTE ITEM	PACKAGING COST	SHIPPING COST	DISPOSAL COST
Metal Block - Non-Control Rod			
Defueling Blocks			
Graphite Blocks			
Spacer & Reflector Blocks			
Core Support Material			
Concrete			
Helium Circulators/Systems		[PROPRIETARY]	
Steam Generators		[ ]	
Lower Floor/Appurtenances		[DATA]	
Resins			
Gas Waste Surge Tank			
Gas Waste Vacuum Tank			
Liquid Waste System			
Metal Control Rod Reflectors			
Core Barrel			
Silica Blocks			
Region Constraint Devices			
Reflector Keys			
Platforms/Cranes			
Balance of Waste			
TOTAL COSTS EACH COLUMN			

TOTAL PACKAGING, SHIPPING & DISPOSAL COSTS **$11,493,128**

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SECTION 6
DECOMMISSIONING TECHNICAL AND ENVIRONMENTAL SPECIFICATIONS

6.1 INTRODUCTION

PSC is developing a set of proposed Technical Specifications applicable to Fort St. Vrain decommissioning activities, and will submit them for NRC approval via separate correspondence. These Decommissioning Technical Specifications (DTS) will include environmental specification requirements, consistent with the guidance provided in DG-1005 (Ref. 1) and 10 CFR 50.82(b)(5).

The Fort St. Vrain DTS will be proposed as an amendment to the Fort St. Vrain Operating License, DPR-34, in accordance with the provisions of 10 CFR 50.90. The DTS will supersede, in their entirety, the existing technical and environmental specifications that are currently provided as Appendices A and B to the Fort St. Vrain Operating License.

6.2 DTS LIMITS AND CONTROLS

The DTS will address activities related to Fort St. Vrain decommissioning after all fuel has been removed from the Reactor Building. During decommissioning, the primary concerns are containment of radioactive materials and control of public and occupational exposures.

With no fuel in the reactor building, there are no requirements for reactivity control or decay heat removal. Accordingly, the DTS will not retain any of the following requirements that are currently included in the Fort St. Vrain Operational Technical Specifications:

- Reactivity control
- Primary or secondary core cooling
- Plant protective systems
- PCRV integrity
- Auxiliary electric power
- Fuel handling

The decommissioning accident analyses provided in Section 3.4 identify the equipment and procedural controls relied upon to minimize radiological exposure to workers and the public. These controls, such as assuring appropriate levels of Reactor Building confinement integrity and radiation monitoring during handling of certain contaminated and activated materials, will be reflected in

the DTS, as appropriate. Minimum equipment functional capabilities and performance levels will be identified, along with periodic surveillance requirements.

The DTS will also include Administrative Controls to ensure that required programs are implemented during decommissioning. The elements of Administrative Controls will include as a minimum, the following:

1. Organization
2. Decommissioning Safety Review Committee
3. Programs and procedures, including a Radioactive Effluent Controls Program and a Radiological Environmental Monitoring Program, to replace the current environmental specifications
4. Reporting
5. Records retention

6.3 REFERENCE FOR SECTION 6

1. "Standard Format and Content for Decommissioning Plans for Nuclear Reactors," Draft Regulatory Guide DG-1005, September 1989.

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SECTION 7
DECOMMISSIONING QUALITY ASSURANCE PLAN

7.1 POLICY STATEMENT

Public Service Company of Colorado (PSC) will establish and implement a Quality Assurance Plan for the Fort St. Vrain (FSV) Decommissioning Project.

This Quality Assurance Plan is based on the requirements of 10 CFR 50 Appendix B as they apply to decommissioning activities and is responsive to other applicable regulatory requirements, and industry codes and standards. The goals of the Quality Assurance Plan are to provide protection of the health and safety of the project personnel and the public, and to comply with regulations and commitments made to the NRC, including the control of personnel exposure to radiation, control of radioactive material, control of radioactive material shipment, and final radiological survey.

Project procedures shall provide for compliance with appropriate regulatory, statutory, and license requirements. Specific quality assurance requirements and organizational responsibilities for implementation of these requirements shall be specified.

Compliance with this plan and project procedures is mandatory for personnel with respect to Fort St. Vrain decommissioning activities which may affect quality and the health and safety of project personnel and the general public. Personnel shall, therefore, be familiar with the requirements and responsibilities of the plan that are applicable to their individual activities and interfaces.

7.2 INTRODUCTION

This Quality Assurance Plan is applicable to and is structured to assure that the regulatory requirements as identified in the Proposed Decommissioning Plan, the requirements of the Decommissioning Technical Specifications (DTS), the requirements of the Radiation Protection Program, the packaging and shipping of radioactive materials, and the final radiation survey are conducted in a controlled manner.

7.3 ORGANIZATION

7.3.1 General

The Quality Assurance organizations of PSC and the Westinghouse team have the authority and organizational freedom to identify quality problems; to take action to stop unsatisfactory work and control further processing, delivery, installation or use of nonconforming items; to initiate, recommend, or provide solutions; and to verify implementation of solutions. The persons and organizations performing quality assurance functions report to a management level that assures the required authority and organizational freedom are provided, including sufficient independence from cost and schedule. The individuals assigned the responsibility for assuring effective execution of any portion of the Quality Assurance Plan have direct access to the levels of management necessary to perform quality assurance functions.

7.3.2 PSC Organization

The PSC Organization is explained in Section 2.4 of this decommissioning plan. Section 2.4 provides organizational charts, together with a summary of the authority and duties of key decommissioning staff members. PSC has overall responsibility for the Quality Assurance (QA) Plan implementation, and is responsible for verifying the effective execution of the plan. PSC performs oversight of the Westinghouse team implementation of the plan through reviews, audits and monitoring activities (surveillances).

7.3.3 Westinghouse Team Organization

7.3.3.1 Quality Assurance

The Westinghouse Nuclear and Advanced Technology Division (WNATD) Quality Assurance Manager reports directly to the WNATD General Manager and ultimately to the Energy Systems Business Unit Vice President and General Manager to ensure the independence of the QA function. The Quality Assurance Manager reports to the Technical Services Manager for administrative direction and implementation of the Quality Assurance Plan. The Quality Assurance Manager and the Technical Services Manager are responsible for assuring effective execution of the Quality Assurance Plan. MK-Ferguson personnel will work under the WNATD QA Plan during decommissioning activities and therefore the WNATD QA organization will apply. Westinghouse Scientific Ecology Group (WSEG) will implement their NRC approved 10CFR71, subpart H, QA Plan, which includes a completely independent

QA organization, for packaging and transporting radioactive material.

7.3.3.2 Key Decommissioning Staff Members

The Westinghouse decommissioning staff is explained in Section 2.5 of this decommissioning plan. Section 2.5 provides organizational charts, together with a summary of the authority and duties of key members.

7.4 QUALITY ASSURANCE PLAN

7.4.1 General Requirements

1. The Quality Assurance Plan shall be:

   a. Documented by written procedures.
   b. Carried out throughout the decommissioning project in accordance with those procedures.

2. The plan shall include identification of the following:

   a. The structures and activities to be covered.
   b. The major organizations participating in the plan, together with the designated functions of these organizations.

3. The plan shall provide control over activities affecting quality and the health and safety of project personnel and the general public.

4. Activities affecting quality shall be accomplished under suitable controlled conditions. Controlled conditions include the use of appropriate equipment, suitable environmental conditions for accomplishing the activity, and assurance that all prerequisites for the given activity have been satisfied.

5. The plan shall take into account the need for special controls, processes, test equipment, tools, and skills to attain the required quality, and the need for verification of satisfactory implementation.

6. The plan shall provide for indoctrination and training of personnel performing activities affecting quality to assure that suitable proficiency is achieved and maintained.

7. The adequacy and status of the plan shall be regularly reviewed.

8. Management of those organizations participating in the plan shall regularly review the status and adequacy of that part of the plan which they are implementing.

9. The plan will be implemented for the final radiological survey to assure confidence in the sampling, analysis, interpretation, and use of data generated. It will apply to all aspects of the survey plan, from personnel qualifications to sampling and field measurements, handling and storing samples, sample reduction, reporting, and records turnover.

7.4.2 General Description

1. This Decommissioning Quality Assurance Plan has been established to govern those activities that may affect the quality of the project, including the health and safety of the project personnel and the general public

2. This Decommissioning Quality Assurance Plan shall utilize the following documents to meet its objectives.

   a. The Westinghouse Fort St. Vrain Decommissioning Project Quality Assurance Plan which provides the details of the Quality Assurance Plans and procedures that will be utilized by each Westinghouse organizational team member.
   b. Westinghouse required procedures at the project implementing level.
   c. PSC oversight process and procedures

7.4.3 Westinghouse FSV Decommissioning Project Quality Plan

1. The plan shall define the QA plans and procedures that will be used by each Westinghouse organizational team member.

2. The plan shall be issued and approved by Westinghouse and PSC.

3. All changes to the Project Quality Plan shall be governed by measures commensurate with those applied to the original issue.

7.4.4 Training

Training programs shall be established for those personnel performing activities affecting quality such that they are knowledgeable in the quality assurance documents and their requirements, and proficient in implementing these requirements. These training programs are described in Section 2.6 of this decommissioning plan.

7.5 DESIGN CONTROL

Consistent with Section 7.2, when operating systems required for decommissioning/dismantling activities, waste packaging activities, or shipping activities require design or modification of existing design, controls shall be applied commensurate with regulatory requirements and the potential impact on quality, and the health and safety of project personnel and the general public.

Appropriate provisions of design control shall include the specifying of design input, the correct translation of input in design documents, the verification of design by persons other than the originator, and the assurance that changes to the design are properly reviewed, controlled, and documented.

7.6 PROCUREMENT DOCUMENT CONTROL

Consistent with Section 7.2, measures shall be established to assure that applicable regulatory requirements, design bases, and other requirements that are necessary to assure adequate quality are included or referenced in the documents for procurement of material, equipment, and services, whether purchased by PSC or by its contractors or subcontractors. To the extent necessary, procurement documents shall require contractors or subcontractors to provide a Quality Assurance Plan consistent with the contractor's potential impact on quality and the health and safety of project personnel and the general public.

7.6.2 Technical and Quality Requirements

1. The Quality Assurance Plan shall contain provisions for controlling procurement of material, equipment, components, and services.

2. Procurement documents shall contain specific technical and quality requirements, as appropriate.

3. Procurement documents shall contain provisions that establish the right of access to vendor facilities and records for source inspection and audits as appropriate.

4. Procurement documents for processing, packaging and transporting of radioactive materials shall specify the license, certificate, or other NRC approval authorizing use of the package. The procurement documents shall specify the documentation requirements referenced in the license, certificates, or other NRC approvals as applicable that relate to the use and maintenance of the packaging and to the actions to be taken prior to shipment.

7.6.3 Review and Approval

Documents, and changes thereto, initiating procurement of equipment, components, or services shall be approved by appropriate management personnel and shall be subject to a quality review to ensure applicable regulatory requirements, design bases, quality assurance, and other requirements are adequately satisfied prior to release.

7.7 PROCEDURES AND DRAWINGS

7.7.1 General Requirements

1. Procedures, and drawings of a type appropriate to the circumstances, shall be provided for the control and performance of activities which are important to quality, health, and safety.

2. Procedures and drawings shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished.

7.7.2 Procedures

1. Procedures of a type appropriate to the circumstances shall be provided for the performance of activities which affect quality, health and safety, or regulatory requirements.

2. The following typical procedures shall be provided as appropriate. This list includes procedures whose implementation is subject to oversight in the QA plan and procedures for executing QA functions.

a. Calibration procedures.
b. Radiation protection procedures.
c. Special process procedures.
d. Work packages that provide work instructions accompanied with pertinent technical data to perform a specific task.
e. Radioactive material processing, packaging and transporting procedures.
f. Audit procedures.
g. QA surveillance/monitoring procedures.
h. Administrative control procedures.
i. Emergency response procedures.
j. Inspection procedures.
k. Training/qualification/certification procedures.
l. Procurement procedures.
m. Design and design document control procedures.
n. Nonconformance/corrective action procedures.
o. Quality Records procedures.
p. Access control procedures.
q. Material/equipment control procedures.
r. Final site survey procedures.
s. Fire prevention/protection procedures.

7.7.3 Drawings and Technical Manuals

Controlled drawings and technical manuals of a type appropriate to the circumstances may be used as procedural documents.

7.8 DOCUMENT CONTROL

7.8.1 General Requirements

1. Measures shall be established to control the issuance of documents, such as procedures, drawings and specifications, including changes, that prescribe activities affecting quality.

2. These measures shall assure that documents, including changes, are reviewed for adequacy and approved for release by authorized personnel, and distributed to and used at the location where the prescribed activity is performed.

7.8.2 Procedure Control

1. Procedures shall be controlled to assure that current copies are made available to personnel performing the

prescribed activities. Procedures shall be independently reviewed by a qualified person and shall be approved by a management member of the organization responsible for the prescribed activity.

2. Significant changes to procedures shall be reviewed and approved in the same manner as the original.

7.8.3 Radioactive Shipment Package Documents

All documents related to a specific shipping package for radioactive material shall be controlled by appropriate procedures. All significant changes to such documents shall be similarly controlled.

7.9 CONTROL OF PURCHASED MATERIAL, EQUIPMENT, AND SERVICES

7.9.1 General Requirements

1. Consistent with Section 7.2, measures shall be established to assure that purchased material, equipment and services conform to the procurement documents. These measures shall include provisions, as appropriate, for vendor evaluation and selection, objective evidence of quality furnished by the vendor, surveillance at the vendor source, and inspection of products upon delivery.

2. The effectiveness of the control of contractor services shall be assessed at intervals consistent with the importance of the service.

7.9.2 Vendor Evaluation and Verification

The adequacy of vendor's Quality Assurance Plan specified in procurement documentation shall be verified prior to use when appropriate. Vendor adherence to their Quality Assurance Plan shall also be verified as appropriate.

7.9.3 Receipt Inspection

1. Commensurate with potential adverse impacts on quality or health and safety, material and equipment shall be inspected upon receipt at the plant site prior to use or storage to determine that procurement requirements are satisfied.

2. Material, parts, and components that are to be utilized for packaging and transporting of radioactive materials shall be inspected upon receipt to assure that associated procurement document provisions have been satisfied.

3. Measures shall be established for identifying nonconforming material, parts and components.

7.10 IDENTIFICATION AND CONTROL OF MATERIALS, PARTS AND COMPONENTS

1. Consistent with Section 7.2, measures shall be established for the identification and control of critical materials, parts, components, and equipment.

2. These identification and control measures shall be designed to prevent the use of incorrect or defective material, parts, components, and equipment.

7.11 CONTROL OF SPECIAL PROCESSES

7.11.1 General Requirements

Measures shall be established to assure that special processes, including welding and nondestructive examination, are controlled and accomplished by qualified personnel using qualified procedures in accordance with applicable codes, standards, specifications, criteria, and other special requirements.

7.11.2 Welding Procedures

Welding activities shall be performed in accordance with qualified procedures. Such procedures shall be qualified in accordance with applicable codes and standards and shall be reviewed to assure their technical adequacy.

7.11.3 Welder Qualification

Measures shall be established to assure welding is performed by qualified personnel.

7.11.4 NDE Procedures

Nondestructive examinations (NDE) shall be performed in accordance with procedures formulated in accordance with applicable codes and standards and shall be reviewed to assure their technical adequacy.

7.11.5 NDE Personnel Qualification

Measures shall be established to assure nondestructive examinations (NDE) are performed by personnel qualified in accordance with applicable codes and standards.

7.12 INSPECTION

7.12.1 General Requirements

1. Measures shall be established for inspection of appropriate activities to verify conformance with the documented procedures and drawings for accomplishing the activity.

2. An inspection hold point requires witnessing or inspection. Associated work shall not proceed beyond a hold point without prior consent. The specific hold points shall be indicated in appropriate work documents.

7.12.2 Radioactive Material Packages

Measures shall be established which assure that packages utilized to ship licensed radioactive material offsite are inspected in accordance with the applicable requirements.

7.12.3 Inspection Procedures

Required inspections shall be performed in accordance with appropriate procedures. Such procedures shall contain a description of objectives, acceptance criteria, and prerequisites for performing the inspections. These procedures shall also specify any special equipment or calibrations required to conduct the inspection.

7.12.4 Personnel Qualification

Personnel performing required inspections shall be qualified based upon experience and training in inspection methods. Required inspections shall not be performed by individuals who performed the activity or directly supervised the activity.

7.13 TEST CONTROL

Measures shall be established to assure that tests necessary to assure quality, health and safety are controlled and accomplished in accordance with approved procedures.

7.14 CONTROL OF MEASURING AND TEST EQUIPMENT

Measures shall be established to assure that appropriate tools, gauges, instruments and other measuring and testing devices used in activities important to quality, health and safety are properly controlled, calibrated and adjusted at specified periods to maintain accuracy within necessary limits, and maintain traceability to National Institute of Standards and Technology (NIST) or other known standards.

7.15 HANDLING, STORAGE, SHIPPING

7.15.1 General Requirements

Measures shall be established to control the handling, storage, and shipping of radioactive materials.

7.15.2 Radioactive Material Storage

1. Areas shall be provided for storage of radioactive material that assure physical protection, as low as reasonably achievable radiation exposure to personnel, and control of the stored material.

2. Handling, storage, and shipment of radioactive material shall be controlled based upon the following criteria:

    a. Established safety requirements concerning the handling, storage, and shipping of packages for radioactive material shall be followed.
    b. Shipments shall not be made unless all tests, certifications, acceptances, and final inspections have been completed.
    c. Procedures shall be provided for handling, storage, and shipping operations.

7.15.3 Shipping and Packaging

Shipping and packaging documents for radioactive material shall be consistent with pertinent regulatory requirements.

7.16 INSPECTION, TEST, AND OPERATING STATUS

7.16.1 Radioactive Material and Systems Configuration Controls

1. Appropriate controls shall be established for the control of radioactive material, systems configuration, as well as personnel exposure.

2. Inspection, test, and operating status of equipment and components associated with radioactive material, system configuration, and personnel exposure shall be established based upon the following criteria:

   a. Inspection, test, and operating status for radioactive material, system configuration, and personnel exposure shall be indicated and controlled by established procedures.
   b. Status shall be indicated by tag, label, marking or log entry.
   c. Status of nonconforming items or packages shall be positively maintained by established procedures.

7.17 NONCONFORMING MATERIALS, PARTS OR COMPONENTS

1. Consistent with Section 7.2, measures shall be established to control materials, parts, or components that do not conform to requirements in order to prevent their inadvertent use or release for shipment. These measures shall include, as appropriate, procedures for identification, documentation, segregations, disposition, and notification to affected organizations.

2. Nonconformance items shall be reviewed and accepted, rejected, repaired, or reworked in accordance with documented procedures.

7.18 CORRECTIVE ACTION

1. Measures shall be established to assure that conditions adverse to quality, health and safety are promptly identified and corrected.

2. In the event of significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined, and corrective action taken to preclude

repetition. These conditions shall be documented and reported to appropriate levels of management.

7.19 QUALITY ASSURANCE RECORDS

1. Sufficient records shall be maintained to furnish evidence of activities important to safe decommissioning as required by code, standard, specification or project procedures. Typical records would include:

   a. Proposed Decommissioning Plan
   b. Procedures
   c. Reports
   d. Personnel qualification records
   e. Radiological and environmental site characterization records, including final site release records
   f. Dismantlement records
   g. Inspection, surveillance, audit and assessment records

2. Records shall be identifiable, available, and retrievable.

3. Requirements shall be established concerning record collection, safekeeping, retention, maintenance, updating, location, storage, preservation, administration, and assigned responsibility. Such requirements shall be consistent with the potential impact on quality, radiation exposure to the workers and the public, and applicable regulations.

4. Records shall be reviewed to ensure their completeness and ability to serve their intended function.

7.20 AUDITS

7.20.1 General Requirements

A system of planned audits shall be carried out to verify compliance with appropriate requirements of the Quality Assurance Plan and to determine the effectiveness of the plan. The audits shall be performed in accordance with written procedures or checklists by trained and qualified personnel not having direct responsibility in the areas being audited.

7.20.2 Audit Reports

1. Reports of the results of each audit shall be prepared. These reports shall include a description of the area audited, identification of individuals responsible for implementation of the audited provisions and for performance of the audit, and identification of discrepant areas.

2. Audit reports shall be distributed to the appropriate level of management and to those individuals responsible for implementation of audited provisions.

7.20.3 Audit Corrective Action

1. Measures shall be established to assure that discrepancies identified by audits are resolved. These measures shall include notification of the manager responsible for the discrepancy, and verification of satisfactory resolution. Discrepancies shall be resolved by the manager responsible for the discrepancy. Higher levels of management shall resolve disputed discrepancies.

2. Followup action, including re-audit of deficient areas, shall be taken where indicated.

SECTION 8
DECOMMISSIONING ACCESS CONTROL PLAN

8.1 BASIS FOR ACCESS CONTROL PROGRAM

The Fort St. Vrain Decommissioning Access Control Plan is based on the requirements of 10 CFR 20.105 and NRC Regulatory Guide 1.86 (Ref. 1).

The Fort St. Vrain Access Control Plan is necessary to be responsive to the following requirements:

1. Prevent unauthorized access to restricted radiological areas and during radiological events or emergencies.
2. Contact local law enforcement and emergency service organizations to respond to:
   a. fire or explosions;
   b. personnel disturbance;
   c. acts of sabotage or perceived threat;
   d. civil disturbance;
   e. medical emergencies

This Access Control Plan identifies those controls and procedures related to access to the decommissioning site. Access control requirements for radiologically controlled areas within the decommissioning site are addressed in Section 3.2 Radiation Protection Program.

This Access Control Plan has been developed to provide controls for the following non-regulated areas:

1. An adequate Industrial Security Program to prevent sabotage (intentional or unintentional) to internal or external decommissioning systems or radioactive waste storage, and to prevent theft of company or contractor materials.

2. Conversion Project: The presence of significant numbers of non-occupational workers on a job site immediately adjacent to the decommissioning/dismantlement project necessitates the need to ensure that access to the decommissioning project area is properly controlled.

8.2 SITE ACCESS CONTROL ORGANIZATION

Access control personnel will be properly trained and demonstrate understanding of decommissioning area access control requirements and responsibilities. Access control personnel will be unarmed and equipped for continuous onsite and offsite communications. The PSC Facility Support Manager is responsible for site access control which includes (1) decommissioning area access control (gatehouse and vehicle access) and (2) emergency, medical and fire reporting. Local law enforcement authorities will receive familiarization briefings on procedures and plant layout, and arrangements will be made for their services if needed.

8.3 ACCESS CONTROL PHYSICAL SECURITY MEASURES

The decommissioning area will be surrounded by a continuous permanent fence that will provide a physical barrier to prevent unauthorized access to restricted areas. Access control personnel will normally be located in the personnel access gatehouse.

Personnel access gatehouses will be located at the main plant entry for the decommissioning area or other suitable access points. A vehicle access gate will be located in the immediate vicinity of the personnel access gatehouse at the main plant entry. Use of the vehicle gate will also be controlled by access control personnel.

Access will be controlled within the Fort St. Vrain decommissioning project and permitted only to those authorized by the PSC Project Manager for Decommissioning, the Westinghouse Project Director, or their authorized representatives. Lists of individuals with authorized access will be prepared and will be controlled.

Access for decommissioning workers will be controlled through positive identification (e.g., picture badges, positive identification, controlled access lists or other means) to ensure access to the decommissioning site restricted area is provided only to authorized individuals.

Access to the restricted area does not guarantee access to radiological controlled areas. The radiation protection staff will continue to administer the radiological controlled area access control program, as was done during operations and defueling. Specific requirements that must be met prior to accessing radiologically controlled areas are identified in Section 3.2.

All persons passing through the gatehouses will be required to demonstrate valid access authorization. All other plant gates associated with the controlled decommissioning area will be required to be kept locked or continuously monitored. Locks and keys for the decommissioning area gates will be controlled.

Visitor access to the decommissioning area must be approved by the PSC Project Manager for Decommissioning, the Westinghouse Project Director, or their designated representatives.

Repairs to physical barriers and equipment will accomplished in a timely manner.

8.4 COMMUNICATIONS

Telephone service will be available at the main plant entry personnel access gatehouse to contact local law enforcement authorities and other local emergency services. Radio communications will be available between the plant control room and access control personnel, in the event it becomes necessary to limit access to the decommissioning area or if it becomes necessary to contact local emergency services.

8.5 PROCEDURES

Written procedures will be prepared and implemented to provide the access control personnel guidance for the following routine occurrences:

1. Personnel access control
2. Vehicle access control
3. Communications equipment and routine testing requirements
4. Surveillance/inspection of decommissioning area physical barriers
5. Recordkeeping requirements

Written procedures will be prepared and implemented to provide the access control personnel guidance for the following abnormal occurrences:

1. Fire or explosion
2. Site evacuation
3. Site radiological emergencies
4. Personnel disturbance
5. Acts or perceived threat of sabotage

6. Civil disturbance
7. Suspected or confirmed intrusion sabotage attempt
8. Breached security area barrier
9. Unidentified person in security area
10. Medical Emergencies
11. Theft of material

The content of these procedures will include (1) criteria for identifying an abnormal conditions within the decommissioning area; (2) access control personnel actions; and (3) required notifications.

8.6 REFERENCES FOR SECTION 8

1. Regulatory Guide 1.86: "Termination of Operating License for Nuclear Reactors". June 1974.

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SECTION 9
DECOMMISSIONING EMERGENCY RESPONSE PLAN

9.1 INTRODUCTION AND REGULATORY BASIS

The Fort St. Vrain reactor was permanently shut down in August 1989. PSC evaluated the credible defueling accidents and determined that the required level of emergency response capability was significantly less than that for the operating reactor. As a result, PSC prepared a Defueling Emergency Response Plan, with a significantly reduced level of emergency response, and submitted it to the NRC in June 1990.

The credible accidents for dismantlement and decommissioning operations have been evaluated in Section 3.4 of this plan. This evaluation indicates that reduced emergency response capabilities are appropriate for the Decommissioning Emergency Response Plan. As the dismantlement and decommissioning proceeds, various tasks and milestones will be completed such that the associated postulated accident scenario will no longer be considered credible. With the reduction in the accident scenarios and resultant consequences, the Decommissioning Emergency Response Plan may be revised to eliminate selected emergency response capabilities.

9.2 DECOMMISSIONING EMERGENCY RESPONSE PLAN SCOPE

9.2.1 <u>Maximum Emergency Action Level (EAL) - ALERT</u>

Based on an evaluation of the credible dismantlement and decommissioning accidents, the accident consequences have been compared with the emergency classification tables contained in FSV procedures and the guidance contained in NUREG-0654 Appendix 1 (Emergency Action Level Guidelines for Nuclear Power Plants) and the EPA Protective Action Guidelines.

The worst case dismantlement and decommissioning accident has been identified to be the postulated tractor/trailer fire from the rupture of the diesel fuel tanks in which the trailer is conservatively loaded with 230 side spacer blocks (boron pins removed). These side spacer blocks have the highest potential releasable quantity of radioactivity. Section 3.4.6 provides a detailed analysis of this accident scenario.

Based on the conservative assumptions for the percentage of graphite oxidation, radionuclide inventory and release, the radiological consequences to an individual standing at the 100-meter EAB result

in a whole body and lung dose of 121 mRem and 215 mRem, respectively. Therefore, no accident condition will exceed the NUREG-0654 guidelines for an ALERT.

9.2.2 EPZ Restricted to Within 100 Meters of the Reactor Building

Based on evaluation of the dismantlement and decommissioning accident consequences in Section 3.4 of this plan, there will be no credible means for offsite exposures to exceed a small fraction of the EPA Protective Action Guidelines or to create the need for either a plume exposure or an ingestion pathway planning zone. Therefore, the EPZ is designated as an area within 100 meters of the Reactor Building, which is within the owner controlled fence. Perimeter monitoring of this onsite EPZ will be performed following any potential radiological release as required by the emergency situation to confirm that there will be no offsite radiological releases above those determined in the analyses.

The 100-meter boundary is sufficient to control access to the onsite EPZ and will allow unrestricted use of Weld County Road 19-1/2.

9.2.3 Offsite Emergency Response by State/Local Governments Eliminated

Section 1.4 of NUREG-0696, "Functional Criteria for Emergency Response Facilities", provides the following guidance regarding activation of ERF's:

1. *"Activation of the onsite TSC and OSC is optional for a Notification of Unusual Event emergency class, and is required for ALERT and higher classes.*

2. *Activation of the nearsite EOF is optional for Notification of Unusual Event and Alert emergency classes, and is required for Site Area Emergency and General Emergency classes."*

Therefore, based on the dismantlement and decommissioning accident consequences, activation of only the onsite ERF's is responsive to the guidance of NUREGs 0654 and 0696, since no offsite consequences can occur that would warrant activation of offsite facilities. Overall control of the remaining credible accidents will be provided by the Emergency Coordinator, located in either the Control Room or the Technical Support Center (TSC).

Limiting the EPZ to onsite areas will eliminate the need for offsite response by State or local governments, including elimination of State radiological monitoring teams who will no longer be needed to monitor the plume exposure pathway.

Since the highest emergency classification is an ALERT, no offsite emergency response is required by either the State or local governments, including offsite radiological monitoring teams, law enforcement, rumor control, media relations, and notification and evacuation support. Other PSC agreements with local agencies supporting onsite activities will remain in effect, including agreements for response to fire and medical emergencies. Periodic media briefings and familiarization regarding radiological emergencies will continue to be offered.

There is no need to supply State and local government organizations with continuous information on accident conditions. PSC will perform initial notification of State and local governments and will inform them of the nature and status of the emergency. Periodic (but not continuous) updates of accident status and recovery activities will be provided.

9.2.4 PSC Offsite Response Capabilities Eliminated

Elimination of the need for offsite response eliminates the requirement for offsite ERF's, including the Forward Command Post (FCP), the Executive Command Post (ECP), and PSC participation at the State Emergency Operations Center (SEOC), and allows elimination of the position of the Corporate Emergency Director (CED), since command and control of the emergency will be restricted to onsite control by the Emergency Coordinator. Deletion of these ERF's and management positions is consistent with the guidance of NUREGs 0654 and 0696, which state that the TSC will perform the functions of the EOF [FCP] during an ALERT.

Additionally, PSC will continue to perform initial notification of the State and local governments (via the Weld County Communications Center and the Colorado Department of Health), as well as provide both organizations with periodic status updates.

9.2.5 Dissemination of Emergency Plan Information to Local Residents

The need for annual dissemination of basic emergency planning information to the public located within the five-mile radius (the

approved EPZ for operations) will no longer be necessary and will not be a requirement of the Decommissioning Emergency Response Plan.

9.2.6 Need for the Offsite Emergency Warning System

The Emergency Warning System, which consists of tone-alert radios and the Platteville siren to warn local residents of protective actions, will no longer be maintained as part of the Decommissioning Emergency Response Plan.

9.2.7 The PCC and TSC will be consolidated under the Control of the TSC Director (Emergency Coordinator)

The onsite emergency response manpower requirements have been evaluated as a result of the reduced consequences of remaining accidents and the elimination of offsite ERF's, and it has been determined that onsite manpower may be reduced and onsite ERF's consolidated. Changes will be made to ERF staffing assignments to reflect the reduced communication requirements with offsite ERF's.

Based on this evaluation, the TSC and Personnel Control Center (PCC) functions will be consolidated in the TSC under the direction of the TSC Director. Consolidating the PCC into the TSC is acceptable for the following reasons: (1) onsite radiological consequences are significantly reduced, which should allow controlled access to all areas in and around the Reactor Building within the 100-meter EPZ; (2) elimination of offsite communication responsibilities reduces minimum staffing requirements; (3) based on minimum staffing levels for an ALERT, this consolidation will not cause congestion in the TSC; and (4) consolidation will allow the Emergency Coordinator (TSC Director) direct control of onsite activities, including field and in-plant surveys, search and rescue, and plant recovery teams dispatched to control and mitigate accident consequences.

As the onsite Emergency Coordinator, the TSC Director has always been ultimately responsible for the function of the PCC, although the PCC Director performed oversight and implementation of these duties. In consolidating the PCC into the TSC, the need for a PCC Director will be eliminated, communications will be handled more directly and effectively, and the potential for miscommunication will be decreased.

With the decrease in severity of remaining credible radiological emergencies, the demands on the TSC Director will be proportionally decreased. This in turn will allow the TSC Director the opportunity to assume direct oversight of duties previously performed by the PCC

without decreasing the effectiveness of the emergency response organization. Consolidation of the teams into the TSC will allow the TSC Director more direct control of corrective actions, while the reduction in minimum staffing will prevent this consolidation from interfering with the onsite command and control responsibilities of the TSC.

9.2.8 Elimination of the EPZ Field Team

Based on the revised accident and radiological consequences, there will be negligible offsite radiological consequences. The EAB field monitoring team will continue to conduct radiological surveys, but will conduct these surveys in the immediate vicinity of the Reactor Building, within the 100-meter EPZ. There is no need for State radiological monitoring, there is no need for the EPZ radiological field monitoring team and it has been eliminated.

9.2.9 Distribution of KI Tablets Both Onsite and Offsite

With the EPZ limited to onsite areas and with negligible short term offsite radiological consequences, there is no longer any need to stock KI tablets. Additionally, all I-131 in the primary coolant has undergone well over fifty half-lives of radioactive decay since the permanent shutdown of Fort St. Vrain and would be non-existent in any future radiological release from Fort St. Vrain.

9.2.10 Notification of Conversion Work Force

Workers involved with conversion efforts will receive information on how to respond in the event of activation of the Decommissioning Emergency Response Plan. Response actions will be initiated to ensure that exposures of conversion workers are kept ALARA.

9.2.11 Formal Recovery Organization and Procedures Revised

The reactor will have been shut down and all fuel removed. The formal recovery procedures required by regulations will be revised to reflect: (1) reduction in the number of operating systems needed to maintain any special conditions for decommissioning; (2) reduction in the severity of possible accident consequences and possible radiological emergencies; (3) reduced minimum staffing of the onsite emergency response organization.

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SECTION 10
DECOMMISSIONING FIRE PROTECTION PROGRAM

10.1 INTRODUCTION

The Fort St. Vrain Decommissioning Fire Protection Program Plan (D/FPPP) will be structured to protect the safety of the decommissioning workers, minimize the risk and consequences of fire damage to the property and minimize the release of radioactive contamination to the public due to a fire involving radioactive materials in order to maintain off-site doses within the guidelines of 10CFR100. Radiological consequences of fires involving the release of radioactive material are discussed in Section 3.4.6.

The D/FPPP will include the following as required to meet the objectives stated above: fire prevention, fire detection and fire suppression. The D/FPPP will be under the jurisdiction of the PSC Decommissioning Engineering Manager and will be administered within the Westinghouse team organization, as appropriate. the The D/FPPP will identify the appropriate portions of the existing fire detection, fire barriers, fire doors and automatic water suppression systems that will be maintained during decommissioning. The existing fire pumps, fire water distribution system and associated hose stations will be maintained.

Portable fire extinquishers will be selected, located and maintained in the general work and storage areas. An inventory of fire extinguishers will be maintained to be issued to those on fire watch duty. permanent fire protection features will be described in the D/FPPP. Work areas will be inspected to assure that housekeeping is being attended to, combustibles are properly stored and unnecessary combustibles are not being allowed to accumulate in work areas.
The D/FPPP will required the implementation of a Hot Work Permit system for all decommissioning activities involving an ignition source such as torch cutting or spark producing tools. The Hot Work Permit system will include pre-work inspection to assure the area is clear of any unnecessary combustibles, the assignment of a trained fire watch with appropriate extinguishers and a post-work watch period concluding with inspection of the area. The Hot Work system will address the elements of fire prevention, fire detection and fire suppression in conformance with the requirements of the D/FPPP.

The personnel assigned to fire watch duty will be trained on the duties and responsibilities of performing fire watch functions including the use of fire extinguishers. The fire watch will extinguish any fires judged to be within the capability of the

available equipment and will report any fire to the PSC Shift Supervisor. The Shift Supervisor or designee will direct the fighting of any fire where assistance is required and will obtain the services of off-site fire departments as the situation dictates.

APPENDIX I
WESTINGHOUSE TEAM SCOPE OF WORK

1.0 PHASE I SCOPE OF WORK

The Westinghouse team scope of work is detailed in this appendix in the form of a Work Breakdown Structure and supplementing descriptions.

1.1 PROJECT MANAGEMENT AND SUPPORT

1.1.1 Project Control

The Westinghouse team will develop a Project Management Plan and conduct all direct management of contractor and subcontractor labor to achieve the project objectives on time and within budget. The Project Management Plan will provide the required interface, reportability, and accountability through the FSV Decommissioning Plan. It will cover the preparation of all required reports, define the records management requirements, define the coordination process, coordinate project meetings, and cover the acquiring of applicable federal, state, and local permits for the Westinghouse team work scope.

The Project Management Plan (PMP) will be tailored to the FSV project application. The PMP will apply to all phases of the FSV project.

1.1.2 General Administration

This includes support services, facilities and equipment required for the day-to-day administration and management of the project. Included are personnel relocation, secretarial services, benefits and timecard administration, business systems, computers, and office equipment and supplies.

1.1.3 Quality Assurance Planning

The Westinghouse Decommissioning Project Quality Assurance Plan will be developed and implemented including subordinate plans, programs and procedures during Phase I.

1.1.4 Licensing/Permitting

The Westinghouse team will support PSC in developing the overall Proposed Decommissioning Plan and will provide input to those

sections of the plan for which the Westinghouse team is responsible. This function will also identify required EPA, state and local licenses, regulations, and permits required for decommissioning and site release. Input to environmental documents and technical support in responding to questions will also be provided as required. The team will assist PSC in obtaining approval for the decommissioning of FSV from the Nuclear Regulatory Commission (NRC), Environmental Protection Agency (EPA), state of Colorado, and other required agencies. This includes resolution of NRC questions and issuance of revisions.

1.1.5 Procurement

The Westinghouse team will develop and implement a procurement management system for acquiring equipment, material, services, and subcontracts required to conduct the decommissioning project.

1.1.6 Health, Safety and Environmental Management

The health, safety and environmental management program will cover both radiological and non-radiological aspects of the project. A radiation protection program, based on programs developed by Westinghouse at other NRC licensed facilities, will be uniquely tailored to FSV decommissioning activities. Other non-radiological health and safety programs will be planned as appropriate for industrial safety operations. A program which incorporates the appropriate elements of the health, safety and environmental safety program will be developed. The program will address both personnel and public safety.

1.1.6.1 Personnel Safety Program: The Westinghouse team will develop and implement a comprehensive safety program that will include the following:

1. Personnel Training: (a) hazardous waste handling; (b) radiological waste handling; (c) asbestos waste handling; (d) OSHA compliance; and (e) radiation protection and ALARA.

2. Programs: (a) respiratory monitoring; (b) medical surveillance; (c) protective clothing; (d) waste handling and packaging; (e) radiation protection; and (f) waste transportation.

1.1.6.2 Public Safety: The Westinghouse team will develop an on-site program which will include:

1. Supplement to PSC site access control
2. Site monitoring and surveillance program
3. Packaging and transportation of radioactive and hazardous materials in compliance with 49 CFR requirements and 10 CFR 71
4. Disposal of all waste in accordance with burial site criteria

PSC will provide access control to ensure the general public is not permitted to enter the controlled decommissioning work areas. The Westinghouse team will control entry to radiation work areas.

1.1.6.3 Radiological Safety: Westinghouse will develop and implement a radiation protection program to ensure radiological safety for the FSV decommissioning. The radiation protection program will provide the required protection to on-site personnel, the public, and the environment. A radiation protection organization will be established to meet the needs of the FSV decommissioning project. All site personnel will receive initial training in radiological safety as it relates to specific requirements of their assigned function and task. Radiation exposure controls will be implemented. These will include ALARA engineering, specification of personnel exposure limits, prework surveys, prework briefings, and access controls for entry to and exit from a restricted area. These will be incorporated into Radiation Work Permits for each task. The Radiation Work Permit will define such elements as the respiratory protection required, radiation shielding, contamination and radiation exposure control procedures to safely complete the assignment. Radiological surveys, personnel dosimeters, and a bioassay program will track the effectiveness of the exposure control program. The Westinghouse team will establish a routine radiation monitoring program to provide PSC assurance that decommissioning activities are being conducted in accordance with work package specifications, under adequate control, and in compliance with NRC requirements. Final radiological records will be turned over to PSC as part of the decommissioning final report.

1.2 ENGINEERING

Phase I engineering addresses the overall engineering effort that supports decommissioning. It includes preparation of the decommissioning plan, safety analyses, project manuals, and detailed procedures.

The Westinghouse team will provide in-depth engineering services for the project. These services include, but are not limited to, all design services required for the project.

Specific services provided will include a "safe structure" analysis of the remaining PCRV structure, tooling and equipment development, evaluations of designated suppliers and mock-up design. Tooling and equipment development will include design drawings, equipment specifications, capacities, and power requirements. PCRV environmental changes, such as radiation fluence effects and creep will be evaluated.

1.2.1 Initial Site Characterization

Radiological characterization will be performed on accessible systems and plant areas. Asbestos to be removed during decommissioning will be identified and tabulated. Wastes and chemicals stored at the site will be identified and tabulated. This study will characterize the FSV site for the presence of radioactive materials and hazardous materials.

The Westinghouse team will conduct the initial radiological characterizations of the PCRV and contaminated systems to validate contamination and activation data and to plan decommissioning work in detail. Insulated systems to be breached will be surveyed for asbestos. Specific PCRV characterizations include the lower plenum radiation levels, the depths and extent of concrete activation, and the activation and curie content of graphite core pieces.

The initial site characterization will include environmental sampling on PSC property, exterior to the restricted area. Tritium monitoring, as well as water and soil sampling, will be conducted to determine the content of radionuclides at these locations. The Westinghouse team will also perform sampling to characterize the site soil and water, including the farm pond, sewage lagoons, ditches, and evaporation ponds.

The Westinghouse team will perform area radiological surveys for facilities such as the Reactor Building, Turbine Building, and BOP areas. Each facility radiological survey will consist of three component measurements:

1. A general area radiation survey reading conducted by walking through areas with a survey meter
2. Radiation survey meter readings at a fixed distance from external surfaces of facilities and equipment

3. A determination of fixed and removable contamination in selected areas

The Westinghouse team will perform radiological surveys of plant systems, in addition to performing a representative contamination survey profile. Survey results will be documented.

1.2.2 Proposed Decommissioning Plan Development

The Proposed Decommissioning Plan will be revised from the SAFSTOR alternative to the DECON alternative consistent with USNRC Draft Regulatory Guide "Standard Format and Content for Decommissioning Plans for Nuclear Reactors" (DG-1005).

1.2.3 Project Manuals

Project manuals containing plans, methods, and procedures for project configuration control, hazards communication safety, training, fire protection, and emergency responses will be developed.

1.2.4 Site Preparation Specification

Site preparations include the establishment of temporary facilities for the support of decommissioning work and the expeditious flow of personnel and material, facility layout, warehousing requirements, and laydown locations. Long-lead decommissioning activities will be identified and planned.

Power, water, and ventilation requirements will be specified. Contaminated segmentation and decontamination/repacking work areas will be planned. Shipping facility areas, requirements, plans, and procedures will be developed.

1.2.5 Decontamination Specification

A decontamination specification will be prepared which provides cost-benefit evaluations and establishes decontamination methods based on site surveys and samples for plant systems, equipment and structures. Support of environmental licensing will be provided as required.

1.2.6 Asbestos Removal Specification

The asbestos removal specification will be developed for the site consistent with the National Institute of Building Sciences Format.

Procedures and the engineering controls for the FSV decommissioning will be developed.

1.2.7 Personnel Testing and Training Programs

Asbestos, radiation worker, safety, waste packaging, and job-specific training programs will be developed.

1.2.7 Liquid Waste Disposal Specification

A liquid waste disposal specification will be written for the processing of contaminated water in the PCRV, concrete cutting water and liquid decontamination wastes. The processing system will be specified and operating procedures developed.

1.3 PCRV D/D DESIGN, SPECIFICATIONS AND DETAILED PROCEDURES

1.3.1 Initial Preparations/Disassembly

The planning phase for the PCRV includes initial characterization, identification of facility requirements, design of special tooling, and the development of dismantling work specifications and procedures.

The Westinghouse team will develop work specifications based on FSV requirements and experience from similar projects. Activity specifications will be prepared to achieve key milestones of the project. From these activity specifications, detailed work plans and procedures will be developed. The planning and preparation in development of these specifications will result in work packages that will ensure proper training of people, verification of obstructions, availability of required tooling, and contingency plans.

1.3.2 Shielded Access to PCRV

Concrete removal and underwater tools will be specified as well as the methods and procedures that provide access to the PCRV cavity. PCRV flooding and work platform designs will be developed.

1.3.3 PCRV Core Dismantlement

Planning and engineering will be performed to determine methods for removal of the PCRV core components and delivery to the packaging work stations.

1.3.4 Core Support Floor, Barrel and Insulation Removal

Planning and engineering for removal of the core support floor, insulation, core barrel and keys, and delivery to the packaging work station will be performed.

1.3.5 PCRV Lower Plenum

Removal of the helium diffusers, steam generators, core support floor columns, plenum lower floor, flexible columns, and lower plenum insulation and cover plates will be specified and described in detailed procedures. Special tooling and mockups for removal of the steam generator primary and secondary assemblies will be evaluated and developed.

1.3.6 Final PCRV Dismantlement, Decontamination and Cleanup

The PCRV activation analyses and test boring will be used to establish the activated concrete removal specifications and procedures. Miscellaneous component removal will be planned, as well as cleanup, demobilization, and final decontamination.

1.4 CONTAMINATED SYSTEMS D/D DESIGN, SPECIFICATION AND DETAILED PROCEDURES

1.4.1 Disassembly Tools

The planning phase for contaminated BOP system activities includes initial characterization, identification of facility requirements, special tooling specifications and design, development of dismantling work specifications and procedures, and training programs.

1.4.2 Dismantling Specifications and Detailed Procedures

Removal and decontamination specifications and procedures will be developed for each of the contaminated BOP systems based on available data and field measurements.

1.5 SITE CLEAN-UP SPECIFICATIONS AND DETAILED PROCEDURES

1.5.1 Tools and Equipment Specifications

If required, tools and/or equipment will be specified, and excavation equipment needs will be determined.

1.5.2 Site Cleanup Specifications and Detailed Procedures

If determined to be necessary, specifications and procedures for cleanup, waste handling of the evaporation ponds, sewage lagoons, diesel storage tanks, effluent ditches, and farm pond will be developed.

1.5.3 Demobilization

Plans for demobilizing site equipment will be provided.

1.6 SOLID WASTE MANAGEMENT PLAN

Solid waste management programs and procedures will be established. The Westinghouse team will work with PSC to contract with a waste burial site for the disposal of low-level waste. If required, methods for handling and disposing of greater than Class C wastes will also be addressed. Refer to Section 3.3, Radioactive Waste Management, for more details.

2.0 PHASE II SCOPE OF WORK

2.1 PROJECT MANAGEMENT AND SUPPORT

2.1.1 Project Control

Project control consists of cost and schedule tracking, refinement to the project schedules, implementation of the project management plan and administrative procedures, administration of contracts, coordination with PSC through the PSC Project Control Manual, document control and records management, and customer-reporting.

2.1.2 General Administration

This includes support services required for the day-to-day administration of the project. Included are personnel relocation, secretarial services, benefits and timecard administration, computers, office equipment and supplies.

2.1.3 Quality Assurance

The Decommissioning Quality Assurance Plan will continue to be implemented for the Phase II decommissioning activities.

2.1.4 Licensing/Permitting

The Westinghouse team will continue to assist PSC in the resolution of licensing issues, responses to regulatory questions, issuance of revisions to licensing documents, and permitting activities for all aspects of decommissioning.

The Westinghouse team will assist PSC in developing a project final report at the completion of the decommissioning effort. The report will provide an overview of the project activities, results of the decommissioning effort, final site status, and lessons learned.

The final report will contain background information on facility history and project purpose. It will describe the facility buildings and systems in terms of pre-decommissioning status for both radiological and other relevant conditions. The initial site characterization will be the pri[illegible]ource for this information. The report will also define and [illegible] the technical approach and objectives of the decommiss[illegible] effort in terms of the initial site conditions. It will [illegible]cribe all completed work phases (project management an[illegible] engineering; site preparation, decommissioning, waste disposal operations; and final site radiological characterization), lessons learned, pitfalls identified, and other observations and evaluations. The report will discuss predicted versus actual results for cost and schedule, waste volumes generated, and exposure of personnel and the general public. It will also describe the residual radioactivity in the remaining structures and systems to formulate the final facility and site radiological condition. The report will review the correlation of the Westinghouse team final site survey and the independent third-party verification survey.

2.1.5 Site Engineering

The Westinghouse site engineering staff will revise the project detailed procedures and engineering documents, provide technical overview of ongoing decommissioning activities by Westinghouse team personnel and subcontractors, and prepare the Final Decommissioning Report.

2.1.6 Health, Safety and Environmental Management

The Westinghouse team will administer the decommissioning radiological health, safety and environmental (HS&E) programs at FSV. Radiological engineering services will perform ALARA evaluations of work practices and worker exposures, classify

radwastes, and oversee the implementation of the site radiation protection program; administer the site release criteria and implementation plan and the final site release surveys. Liaison will be provided with the Independent Verification Contractor and supporting laboratories. Industrial safety management, first aid, and contaminated laundry services will be provided.

2.1.7 Project Closeout

Closeout activities include the removal of the temporary structures, with document turnover to PSC, and the logistics associated with the demobilization of the site.

2.2 FACILITIES AND SERVICES

2.2.1 Site Preparations

Common site facilities and services are those required for support of decommissioning activities. Site facilities required to support decommissioning, decontamination, waste packaging, shipping, equipment repair, and storage are established in accordance with the site preparations specification.

2.2.2 Personnel Testing and Training Programs

Asbestos, radiation worker, safety, waste packaging, and job-specific training programs will be implemented.

2.2.3 Liquid Waste Disposal

Liquid waste disposal includes the installation of the water cleanup and clarification system (See Section 2.3) as well as its operation and dismantling/removal from the site.

2.2.4 Decontamination

Decontamination will be performed on plant components and plant structures for unrestricted release and the site release surveys.

2.2.5 Operations Support

Craft operations support personnel will include crane operators, electricians, carpenters, tool crib attendants, and teamsters to perform site support functions.

2.2.6 Procurements

Procurement includes the purchase of tools, equipment, vehicles, supplies, office furniture, and utilities required to support decommissioning activities in accordance with the procurement management system.

2.2.7 Radiological Surveys and Assessments

2.2.7.1 Pathway Analysis: When the FSV facility has been dismantled and decontaminated, the Westinghouse team will assess the residual radioactivity in the remaining structures, systems, and surrounding environment. From this information, a pathways analysis may be necessary. This assessment would identify and evaluate plausible natural and human-induced events that could affect the containment of residual radioactivity in remaining systems, facilities, and surrounding site and the consequence on any further release of residual radioactivity.

2.2.7.2 Final Radiation Survey: Upon completing the decommissioning project operations, the Westinghouse team will present the site to PSC in a condition that meets the specified release criteria. The Westinghouse team will conduct a comprehensive survey before the PSC selected third party (independent verification contractor) conducts the independent verification survey.

The comprehensive radiological survey will include:

1. PSC property, soil, stream, and pond sediment, and water sampling outside the fenced area for radioisotopic analysis.
2. PSC property soil, lagoon sediment, and water sampling inside the fenced area for radioisotopic analysis.
3. Tritium air sampling for both off-site and on-site areas.
4. Radiological surveys for the PCRV, Reactor Building, and other site buildings.

NUREG/CR-2082 "Monitoring for Compliance with Decommissioning Termination Survey Criteria" will be used as a guide in developing a comprehensive survey program for quantifying residual radioactivity and radiation levels.

All materials remaining as part of the PCRV structure, in the systems outside of the PCRV and in the site ponds and waterways

after the final radiation survey will comply with NRC release limits to allow PSC to relinquish its license.

2.3 PCRV DISMANTLING AND DECONTAMINATION

2.3.1 Initial Preparations/Disassembly

Special tools are delivered and the work areas prepared. Asbestos is removed to allow unhindered access to the required plant components. The necessary PCRV tendons are detensioned and removed, and the initial removal activities in the PCRV begin.

2.3.2 Shielded Access to PCRV

Concrete removal and underwater tools are set up in the work areas, contamination control is established, and PCRV flooding and the top head cutting operations proceed. The work platform is installed in the open PCRV cavity.

2.3.3 Dismantle PCRV Core

Using the work platform, the PCRV core components are removed and delivered to the packaging work stations as appropriate.

Dismantlement activities will include the following: 1) decontaminate in place, remove and decontaminate, remove and dispose of the contaminated and activated materials inside the PCRV and those that form the PCRV structure, 2) decontaminate in place, remove and decontaminate, remove and dispose of the contaminated portions of the systems outside of the PCRV, and 3) survey to the extent necessary to achieve unrestricted use and to eliminate the requirement for PSC to maintain a 10 CFR 50 license.

2.3.4 Core Support Floor, Barrel and Insulation

The core support floor, insulation and core barrel and keys are removed and delivered to the packaging areas designated.

2.3.5 PCRV Lower Plenum

The helium diffusers, steam generators, core support floor columns, plenum lower floor, and lower plenum insulation and cover plates are removed and delivered to the appropriate packaging and laydown areas.

2.3.6 Final PCRV Dismantlement, Decontamination and Cleanup

The PCRV activated concrete is removed, along with miscellaneous components. Cleanup, demobilization, and final decontamination are performed prior to final release surveys.

2.4 CONTAMINATED SYSTEMS D/D

2.4.1 Initial Preparations/Disassembly Tools

Asbestos removal will precede any dismantling of systems or components. Dismantling tools will be delivered to the work areas and prepared for use.

2.4.2 Dismantling Operations

Contaminated systems will be removed and/or decontaminated per procedures developed in Phase I.

2.5 WASTE PREPARATION, PACKAGING SHIPPING, AND DISPOSAL

The solid waste management plan will be implemented for the classification, packaging and shipping of radioactive wastes.
The Westinghouse team will properly package radioactive waste at FSV and transport it, except for GTCC, either directly to the appropriate disposal site or to WSEG (Westinghouse Scientific Ecology Group) in Oak Ridge, Tennessee. GTCC, if any, will remain at the FSV site for final disposition. After processing, the waste will be packaged for disposal at one of the commercial disposal facilities. The team will package all waste in accordance with a State of Tennessee-issued Radioactive Materials License, PSC's NRC-issued Radioactive Materials License, burial site criteria, and other applicable state and federal regulations.

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APPENDIX II

FORT ST. VRAIN ACTIVATION ANALYSIS

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REV B

FORT ST. VRAIN
ACTIVATION ANALYSIS

Prepared by:	Valerie C. Walker	10/26/90 Date
Verified by:	Russell Sherman	10/29/90 Date
Approved by:	[illegible] Diamond Hill Engineering Manager	10/31/90 Date

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

FORT ST. VRAIN ACTIVATION ANALYSIS

I. INTRODUCTION

This report summarizes the results of the activation analysis performed for the Fort St. Vrain (FSV) Pre-stressed Concrete Reactor Vessel (PCRV) and internals. This analysis determines the isotopic composition, magnitude, and extent of residual radioactivity in the PCRV and internals which would be present after operation through 232 Effective Full Power Days (EFPD) in Cycle 4. The information provided in this report is for use in decommissioning planning activities. The results presented in this report include dose rates inside the PCRV at various times after shutdown, and the curie inventory for individual components and for the overall PCRV.

II. BACKGROUND

The FSV generating station ceased operations on August 18, 1989. Defueling of the reactor core to the Fuel Storage Wells has commenced. To date, twelve regions have been defueled and replaced with boronated refueling blocks. Final disposition of the spent fuel has not been determined. The fuel may be shipped to Idaho National Engineering Laboratory or another DOE facility. The fuel may also be stored on site in an Independent Spent Fuel Storage Installation (ISFSI) until a high level waste repository is available.

In order to accurately plan activities for decommissioning, an estimate of the extent and isotopic composition of residual radioactivity must be predicted. In early 1988, Public Service Company enlisted the services of Ebasco's Advanced Technology Group to develop a computer model for the FSV reactor and train PSC personnel on model development and the use of all computer codes associated with the activation analysis.

The necessary computer codes were installed on PSC's IBM mainframe by PSC personnel. PSC personnel worked with Ebasco in the development of the models used to analyze the PCRV. Additionally, Ebasco gave several training sessions covering the topics listed in Table 1.

III. ANALYSIS METHODOLOGY

A. Code Descriptions

The computer codes installed on the IBM 3090 included transport, activation, and radiation shielding codes. In addition to these codes, several utility codes to handle data sets and output were developed by PSC personnel. Table 2 lists the computer codes and data libraries that were installed on the IBM mainframe.

ANISN and DOT are multi-group, one- and two- dimensional discrete ordinates computer codes with anisotropic scattering. REBATE is an activation code for the calculation of activation product production rates for one- or two-dimensional multigroup neutron flux distributions. ORIGEN is an isotope generation and depletion code which calculates the buildup, decay, and processing of radioactive materials using only a single point thermal neutron flux input and spectrum modifiers to account for the higher energy flux distribution. ISOSHLD is a point kernel integration code which performs gamma ray shielding calculations for radioactive sources in a wide variety of source and shield configurations. Volume 1 of Appendix A includes user's manuals, sample problems, and installation problems/comments pertaining to PSC's IBM version of the codes.

Four utility codes were developed by PSC for data handling. SITEREB processed REBATE output into a format which provided the isotopic inventory of the activation products for each component. SRCEDOS1 also processes REBATE output to develop the gamma source input for ANISN. SRCEDOS2 reads ANISN output and calculates dose rates within the PCRV. POSTREB processes the REBATE output to a more readable format.

B. <u>Calculational Sequence</u>

The analysis was divided into three models: Radial, Axial Up, and Axial Down. The calculation sequence was similar for all three models.

The calculational sequence involved the use of the ANISN, REBATE, SITEREB, SRCEDOS1, and SRCEDOS2 codes. Figure 1 shows a flow chart for the activation analysis process. Volume 2 of Appendix A details the analysis steps and computer files used.

The first step in the calculational sequence was to determine the netron flux throughout the reactor core and the PCRV. The BUGLE-80 cross section data library was collapsed to 16 group cross sections, using the COMMAND code. These 16 group cross sections were used as input to ANISN. Neutron fluxes taken from the GATT fuel accountability were used in setting the proper neutron source input to ANISN (Ref. 1). The spatial neutron flux in the reactor through the 1014 GATT regions, over six layers, was searched for the blocks on the edge of the core with the highest flux. A radial traverse from core center line to the maximum flux block was used to set fuel nuclide number densities to the radial ANISN model. This same method was used to determine the fuel number density inputs to ANISN for the Axial Up and Axial Down analyses.

The 16 group neutron fluxes were normalized to match the 4 group GATT fluxes. This was accomplished by collapsing the ANISN flux output to 4 groups for comparison with the GATT results. The group structure of the neutron source ANISN input was then redefined (if necessary) and the process repeated until the GATT and ANISN (4 group) fluxes were within a factor of 2. Figure 2 shows the agreement between fluxes for the radial case. The flux ratios for the axial cases are shown in Figures 3 and 4.

The final 1-D neutron flux for all three cases is shown in Figures 5 through 7. Further details of the ANISN neutron flux calculations can be found in Volume 2, Section 1 of Appendix A.

The second step in the analysis was to determine the activation of the selected PCRV components due to the neutron flux previously calculated. The activation of PCRV internal components and concrete was calculated with the REBATE code and some auxiliary utility routines. The input to REBATE included the neutron fluxes from ANISN, material number densities of the components, power history of the reactor, and geometry of the components. The details of the REBATE model are discussed in Volume 2 of Appendix A.

The material number densities for the components are discussed in Section III.D of this report.

The actual and projected power history of the reactor was used to determine the input neutron flux pulse. A 70% power pulse was input for a time equivalent to operation through 232 EFPD in Cycle 4 (corresponding to the August 18, 1989 shutdown date).

The total curies of each component were calculated from the REBATE output using the SITEREB post processing utility code. This code processed the REBATE output to determine the activity of each component as a function of time.

The third step in the analysis included the computation of dose rates inside the PCRV. The REBATE gamma flux output was processed with the SRCEDOS1 code to an acceptable format for the ANISN gamma ray transport calculation. This calculation required the use of the ANISN code for the determination of the spatial gamma ray flux resulting from the radioactive decay of the activation products in the various components left within the confines of the PCRV. The SRCEDOS2 code transformed the 11 group gamma ray fluxes as a function of space into radiation dose rates within the PCRV.

The TSO data sets used in the activation analysis and some users notes are included in Attachment 1.

C. Computational Models

The analysis was performed using three 1-D models: Radial, Axial Up, and Axial Down. The Radial neutron flux model extended from the fuel outward through the PCRV concrete. The Axial Up and Axial Down neutron flux models contained components from the fuel through the top head, and from the fuel through the core support floor, respectively. The neutron activation models assumed that all fuel and removable reflectors had been removed from the PCRV, and that air had replaced the helium within the PCRV. Volume 2 of Appendix A details each model, input variables, and assumptions used in the analysis. The major components modeled for the activation analyses in all three directions were:

Radial	Axial Up	Axial Down
Side Removable Reflectors	Metal Clad Blocks	Lower Removable Reflectors
Permanent Reflectors	Region Constraint Devices	Core Support Blocks/Posts
Boronated Spacer Blocks	Lower Orifice Valve Assembly	(Helium Plenum)
Core Barrel	(Helium Plenum)	Silica Block Insulation
(Helium Plenum)	Cover Plates/Kao-wool Insulation	CSF Cover Plates/ Kaowool Insulation
Cover Plates/ Insulation	PCRV Liner/ Cooling Tubes	CSF Liner/ Cooling Tubes
PCRV Liner/ Cooling Tubes	Top Head Concrete/ Rebar	CSF Concrete/Rebar
PCRV Concrete and Rebar		
Reflector Keys		

Radial Model

The Radial model consists of eight basic components listed above. The removable side reflector hexagonal elements are located just outside of the active fuel. These blocks are constructed of graphite and are removed during defueling. A typical block is approximately 31 inches in height, and 14 inches across the flats. These reflectors were modeled in the neutron flux calculations, but not in the activation calculations since they will be removed during the defueling process.

Beyond the hexagonal removable reflectors are the large permanent graphite side reflector blocks. These blocks are irregular in shape (See Figure 8), having average approximate volume of 3.358E+05 cc each.

Between the large reflectors and the core barrel are the boronated side reflector spacer blocks (Figure 8). These blocks are constructed of graphite and contain boronated stainless steel rods which were designed for neutron shielding during power operations. The number of rods varies with core location of the spacer blocks.

The core barrel (Figure 8) is located just beyond the boronated spacer blocks and serves as lateral restraint of the fuel and reflectors. The barrel is constructed of carbon steel, consists of three sections varying in thickness from 2.25 inches to 2.75 inches, and is approximately 29 feet in height. The core barrel is modeled in two sections because the upper 12 feet is constructed of a slightly different material than the bottom two sections.

Class A kaowool insulation and cover plates (Figure 9) cover the inside of the PCRV liner. The insulation is a ceramic fiber material and the cover plates are constructed of carbon steel.

The PCRV liner (Figure 9) is a 3/4-inch carbon steel plate vessel in the form of a right circular cylinder, 31 feet inside diameter, and 75 feet in height. Carbon steel cooling tubes are welded to the outside (concrete side) of the liner. These tubes provided cooling to the concrete during power operations. The liner and cooling tubes were modeled homogeneously for the activation analysis.

The PCRV concrete serves as the primary containment of the coolant. It varies in thickness from 9 feet to 15-1/2 feet, and is approximately 106 feet high. The PCRV is modeled as a homogeneous mixture of concrete and rebar.

Two final components modeled are the carbon steel side reflector block keys (Figure 8) which connect the core barrel to the large side reflectors and the carbon steel metal shell for the top-most, large side reflectors (half length reflectors).

Axial Up Model

The Axial Up model includes six basic components. As in the Radial model, the removable graphite reflectors just above the fuel were used for neutron flux calculations, but were not considered for activation. The keyed metal plenum elements or metal clad blocks (MCB) were analyzed. The blocks are located on the top-most level of the core area (See Figure 8) and provide structural stability and netron shielding during power operations. All blocks are hexagonal in shape, approximately 15 inches in height and 14 inches across the flats. The central column MCB (Figure 10) is constructed of stainless steel. The side MCB's, with and without coolant holes (Figure 11), are constructed of carbon steel.

The region constraint devices, RCD's, (Figure 12) provide restraint of fuel regions during power operations. The RCD's are located on top of the MCB's, keying fuel columns between regions together. The triangular main body of the device is made of carbon steel, approximately 5 inches thick. The "legs" of the device are approximately 7 inches in length and are composed of inconel.

The orifice valve assembly (Figure 13) is located just above the central column MCB (or keyed control rod element). The

lower portion of this assembly, primarily composed of carbon steel, is modeled as part of the Axial Up model.

The final three components (kaowool/cover plates, PCRV liner/cooling tubes, and PCRV concrete/rebar) are modeled as previously discussed in the Radial model.

Axial Down Model

The Axial Down model includes five components. Directly beneath the active core, there are removable bottom reflectors (Figure 14). These include hexagonal graphite reflectors, graphite reflectors containing boronated Hastellox-X cans and graphite transition reflectors which channel coolant to the core support blocks. The core support blocks and core support posts (Figure 14) are permanent components which lie directly below the removable reflectors and act as support for the fuel and reflectors. Three layers of Class C silica insulation (blocks) are located above the cover plate /kaowool which are just above the CSF liner (Figure 15). The CSF liner is a 3/4-inch carbon steel liner covering the 5-foot thick concrete/rebar core support floor.

D. Material Compositions

The material compositions of the components were taken from a variety of sources. In most cases, the material composition and densities were taken from component drawings which referenced the standard specification (AISI, ASTM, ASME, etc.). Information on the trace element material composition of reactor components was difficult to obtain. Reference 2 was used in the assumptions of trace elements for concrete. Hand calculations for material compositions and document references are located in Attachment 2. The material composition data base is included in Appendix B.

In general, the reactor internals are made of carbon steel and graphite. Very few components are composed of stainless steel. The presence of trace elements such as cobalt, niobium, and europium in steels and concrete could have a large effect on long-term dose rate of PCRV components. Assumptions for these and other trace elements in various materials are discussed below.

Stainless Steels

Reference 2 indicated from LWR samples that in stainless steel components, the Co-60 ranges widely, more than an order of magnitude. Nb-94 samples also had a wide variability, but the average concentration was an order of magnitude below that of Co-60. For this analysis, it was assumed that any stainless steel component had a cobalt concentration of 0.2%. This assumption was based on information from previous activation studies (Ref. 3).

The two components modeled that were constructed of stainless steel were the center column metal clad blocks and the boronated rods in the spacer blocks. In each case, the cobalt level was assumed to be 0.2%. A comparison of this value (Attachment 3) was made with sample data from Reference 2. NUREG/CR-3474 showed that the cobalt range for type 304 stainless steel ranged from 229 to 2570 ppm with an average of 1414 ppm. The 0.2% cobalt value in the analysis equated to approximately 2000 ppm. Therefore, the assumption of 0.2% cobalt for stainless steel was assumed adequate.

The niobium level in stainless steel was specified for the metal clad blocks in the material standard. The niobium level for the boronated rods in the spacer blocks is not listed in the material specification and was assumed to be negligible. Since NUREG/CR-3474 indicated the possibility of high levels of niobium in stainless steel, a separate analysis was performed to verify this assumption. The average niobium concentration specified in NUREG/CR-3474 was used as the concentration level. The analysis showed (see Attachment 4) that at 5 years after shutdown, the curie concentration of Nb-94 was six orders of magnitude less than Co-60, and 3 orders of magnitude less at 60 years. Europium was not included as a trace element in the stainless steel because NUREG/CR-3474 indicated that its presence in stainless steels was very low.

Inconel

The pins on the region constraint devices were the only components modeled that were constructed of inconel. Both the cobalt (1.0%) and niobium (5.13%) levels were specified

in the ASME material standard and used in the analysis.

Carbon Steels

The cobalt level in carbon steels was assumed to be 0.02% (Ref. 3). Similar comparisons as performed with the stainless steel were performed (Attachment 3). In carbon steels, the cobalt range was for 93 to 151 ppm with an average of 122 ppm. The analysis for the PCRV liner and core barrel used approximately 200 ppm. Therefore, the assumptions of 0.02% cobalt for carbon steel were conservative. Niobium and Europium traces were considered negligible for carbon steel.

Concrete

The major material constituents for the concrete and rebar were taken from FSAR values. Since no sample data was available to determine trace element abundancies, average values from NUREG/CR3474 sample values were used. Europium was included as a trace element in the concrete with a 0.55 ppm abundancy.

Graphite

Activation of graphite components was considered to be due to irradiation of impurities only. Table 3 lists the impurities used in the analysis. Cobalt was also assumed to be present. Its concentration (ppm) was assumed to be 0.01% of the iron content.

Kaowool and Silica Insulation

Material compositions for the Kaowool and Silica block insulation were taken from the FSAR and material reference documents.

IV. RESULTS

The results of the activation analysis are presented in two sections: dose rates in the PCRV with various components removed and the activity (CURIE inventory) for the specified components.

A . PCRV Dose Rates

Radiation dose rates due to activated material within the PCRV were calculated for a variety of scenarios in which various components were removed. These dose rates are for an individual "standing" in the very center of the reactor cavity after the fuel and removable reflectors have been removed. Since the calculations were performed using three 1-D models, the total dose is the sum of the dose rates from all three directions. The dose rates were calculated for a time 5 years after shutdown, and 60 years after shutdown.

After the defueling and removal of the defueling blocks, the components which remain in the radial direction extend from the large side reflector through the concrete: in the Axial Up direction from the cover plate/kaowool through the top head concrete, and in the Axial Down direction from the core support blocks through the core support floor.

Tables 4 and 5 indicate the contribution of each direction at 5 and 60 years after shutdown. With all the components remaining in the PCRV, the major contribution at both 5 and 60 years is from the radial direction. This is due to the high dose rate from the boronated spacer blocks.

The large side reflectors provide shielding from the boronated spacers. If the large reflectors are removed, the radial dose rate is as high as 230 R/hr at 5 years, and 0.16 R/hr at 60 years. This clearly indicates that dismantlement must be entirely performed remotely at 5 years, and portions performed remotely at 60 years.

The dose rate in the PCRV reactor volume is dominated by the dose contributions from the radial components until the boronated spacer blocks are removed. If the spacer blocks are removed (leaving the core barrel), the radial dose rate drops to 0.02 R/hr (at 5 years) and to .009 R/hr if the core barrel, cover plates, and insulation are removed.

The Axial directions do not have major contributions to the total dose rate until the liner/concrete is exposed in all directions (i.e. the spacers, core barrel, cover plates/insulation, and core support are removed).

In the Axial Down direction, the core support posts and blocks shield the rractor space from a higher dose rate due to the core support floor liner, cooling tubes, and concrete. The dose rate at 5 years with the CSB remaining is about 0.06 R/hr, but with only the liner and concrete remaining, the dose is about 0.25 R/hr. The Axial Up contribution when the coverplates/insulation are removed is approximately 0.44 R/hr.

A . Residual Limits

No formal limits on activation exist for unrestricted release. Informal guidance by the NRC suggests that a dose of below 5.0 micro R/hr would be an acceptable limit. Tables 4 and 5 indicate the approximate depth of concrete in each direction which would require removal to obtain this limit.

B. Component Curie Inventory Summary

The analysis determined the total activity (curies) of each component described in Section III.C. Table 6 summarizes the total isotopic and curie level for each permanent component and the entire core. Appendix C contains a more detailed curie inventory by isotope for each component.

In the large side reflectors, the activation products are due to the impurities in the graphite. Few high energy gamma emitters are present in the large side reflectors. The total activity is composed primarily of tritium, Co-60, Ca-41, Fe-55, and Ca-45 (short term). In the dose rate from the PCRV liner and cooling tubes, Co-60 is the primary contributor to dose at 5 and 60 years. In the long term, Fe-59 and Ni-63 become more important.

The metal shell for the large side reflectors is located only at the top of the core. Typical isotopes for metals are present. Co-60 is again the dominant gamma emitter, and Fe-55 contributes to the total activity.

The spacer blocks are the primary contributors to the dose rate in the PCRV. This is due to the high amount of Co-60 in the boronated rods and the large number of rods. Co-60 is the major gamma emitter at both 5 years and 60 years after shutdown. Stainless steel may potentially have niobium as a trace element. Niobium was not originally included as a trace element in the boronated rods, but a separate analysis shows that when an average value for niobium is included (see Material Composition section), its concentration is negligible in terms of dose rate and total activity. Other contributors to the total activity are Ni-59, Ni-63, Fe-55, and C-14, all of which are beta emitters. Ni-63 has the highest concentration and, due to its long half life, will be a major constituent in long-term waste disposal.

The core barrel is divided into three sections of different thicknesses. The top portion is constructed of a slightly different type of carbon steel than the bottom and middle sections, and was therefore modeled separately. In the upper section of the core barrel, the dose is from Co-60 with some contributions from Mn-54 at 5 years. Co-60 is primary dose and activity contributor for the upper core

barrel at both 5 and 60 years. Other contributors include Mn-53 and Fe-55, and Fe-59 in the short term. In the lower section of the core barrel, Co-60 is again the dominant gamma emitter at both 5 and 60 years after shutdown. Fe-55, Mo-93, and Nb-94 make minor contributions to dose and activation in both the short and long term.

The cover plate/kaowool mixture is considered together since the cover plates and insulation are layered in most places in the PCRV and would be removed simultaneously. The dose rate from the cover plate/kaowool mixture in the upper portions of the PCRV is dominated by the Co-60 in the cover plates. The mixture also contains Ca-41, Fe-55, Ni-63, and C-14 which may dominate in long-term disposal considerations.

The PCRV concrete/rebar mixture contains many activation products due to the trace elements in the concrete. Reference 2 lists potential problem beta and gamma emitters. The major gamma emitters listed are Co-60, Eu-152, Eu-154, Ag-108m, and Ba-133. At 5 years after shutdown, the concentrations of Co-60 and Eu-152 are relatively close. Together, they dominate the total dose. Co-60 is the primary dose contributor in the short-term since it has higher energy gammas. In the long term, the Eu-152 will dominate. At 5 years, the concentration of Eu-154, Nb-94, Ag-108m, and Ba-133 are at least an order of magnitude below that of Co-60 and Eu-152. Ba-133 is not included in the REBATE library, but an ORIGEN2 run was performed by Ebasco (Attachment 5) to determine its concentration relative to Co-60.

Beta emitters listed in Reference 2 were H-3, Be-10, C-14, Ni-63, and Tc-99. Tritium has the highest concentration at 5 years. Although not mentioned in the reference, Ar-39 has the next highest concentration. The other beta emitters listed are several orders of magnitude less than the tritium.

Isotopes decaying by electron capture are also listed: Ni-59, Mo-93, and Ca-41. Of these three, Ca-41 is the most abundant. The PCRV concrete also has a high concentration of Fe-55. Mo-93 and Ni-59 are several orders of magnitude less than Ca-41 and Fe-55.

The hastelloy-x cans located in the lower reflector blocks contain Co-60 as the primary dose contributor.

The core support blocks (PGX graphite) are very similar in material composition to the large permanent reflectors. H-3, Ca-41, and Fe-55 are again the dominant isotopes in the long and short term. Ca-45 again has a relatively high concentration at 5 years but decays rapidly, such that very little remains after 60 years.

The three layers of silica blocks are located just above the cover plate/kaowool on the core support floor. Fe-55 is abundant in lar quantities at 5 years, and Ni-63 at 60 years. C-14, Ca-41, and Ni-59 are also present in traces. Co-60 is the dominant gamma emitter.

The central column metal clad blocks contain high concentrations of Ni-63, Co-60, and Fe-55 at 5 years. Other isotopes present in the MCBs are Mn-54, Ni-59, and Nb-94.

The surrounding MCBs are constructed of a different material than the center column. They are high in Co-60 and Fe-55, but have low concentraiton of Nb-94 relative to the center column.

The orifice valve lower section has a relatively low activity level. Co-60 is the primary gamma emitter.

The RCDs contain fairly high concentrations of Co-60, Fe-55, and Ni-59 at 5 years. Primary dose contribution is from Co-60 in both the long and short term.

V. CONCLUSIONS

The primary dose contributor in the PCRV is Co-60. Cobalt is present in the majority of components. Other gamma emitters such as Nb-94 and Eu-152 contribute to the dose, as well. In the PCRV concrete, Eu-152 becomes the dominant gamma emitter in the long term.

The total activity of the PCRV and permanent internal components is on the order of 8.0E5 curies at 5 years after shutdown. The large graphite reflector contributes to 90% of the activity. Tritium, Co-60, and Fe-55 (short term) are the dominant nuclides in the reflectors. Ni-63, Ni-59, Ca-41, Ar-39, and Mo-93

contribute in varying degrees to the total activity. Long-term disposal considerations will be affected by the longer-lived nuclides.

The results of this analysis show that the dismantlement of the reactor and internals without the use of remote techniques is impossible at 5 years after shutdown. The high doses from the boronated spacer blocks prevent human access for even short periods of time. Dose rates from the spacer blocks are approximately 230 R/hr when no shielding is provided by the large reflectors. If the spacers are removed, the dose rate from the top would limit access since dose rate ranges from 0.4 - 0.2 R/hr (dependent on remaining components).

The depth of concrete requiring removal to meet the 5 micro R/hr limit is about twice as high at 5 years as at 60 years after shutdown. Approximately 2' would require removal in the Radial and Axial Down directions, and 3' from the top head at 5 years after shutdown.

If the PCRV were dismantled after the 60-year SAFSTOR period, dose rates of approximately 0.2 R/hr would allow the use of remote techniques with very limited access during the removal of the spacer blocks. Once the spacer blocks are removed, the maximum total dose rate would be on the order of 0.5 mR/hr, allowing access into the PCRV.

The required depth of concrete removal at 60 years would be approximately 6"-8" in the Radial and Axial Down directions. The top head would require 16"-18" of concrete to be removed.

VI. REFERENCES

1. GA Fuel Accountability, GATT Flux Tape, EOC3.

2. NUREG/CR-3474, "Long-Lived Activation Products in Reactor Materials", published August, 1984.

3. "Fort St. Vrain Nuclear Generating Station, Unit No. 1, Decommissioning Cost Study," April 12, 1982, Revised September 15, 1982.

EE-DEC-0010
REV. B

TABLES

TA'LE 1

Topics of Instructional Sessions

Session	Topic
1	Nuclear Data Libraries
2	Transport Equation, Multigroup Library, AMPX Modular Code System; Activation Data and Radioactive Decay Data
3	ANISN and its Input Data Preparation; Activation Calculation Sequence; DOT 4.3. Options
4	Activation Analysis
5	ORIGEN and its Input D›ta Preparation; ISOSHLD and its Input Data Preparation

TABLE 2

List of Nuclear Codes and Data Libraries

Code No.	Code Title	Type of Code
CCC-254	ASISN	Major Nuclear Codes fc:
CCC-429	DOT IV Version 4.3	Radiation Transport
ΓG-2561	REBATE	Activation Analysis, Isotope
CCC-371	ORIGEN	and Activity Generation Codes
CCC-79	ISOSHLD	Radiation Shielding Code
PSR-63	AMPX-II	Nuclear Data Utilities
PSR-110	DOQDP	Angular Quadrature Sets
DLC-75	BUGLE-80	Nuclear Data Library

TABLE 3

Graphite Impurities

	PGX	ATJ	H451	H327	HLM
Bulk Density (g/cc)	1.76 ± 0.06	1.73	1.74 ± 0.025	1.77 ± 0.04	1.8 ± 0.04
Mean Impurity Level (ppm)*					
Ash	4900	0.158%	100	130	4200
B	2	1.25	2	1	3
Fe	1900	10.1	9	20	2000
Va	14	8.25	7		42
Ti	28	14.75	6		39
Ca	190	290		30	95
Si	62	60	35		65
Al	66	28.5			45
Ba	34	50			25
S	310	3.3	3	3	38
Li	2	<0.001%	0.036	0.1	2
Cu		1.5			
Mg		1.5			
Mo		1.25			
Ni		0.75			
Ag		0.5			
Zr		1.3			

* All impurities in ppm except for Ash and Li in ATJ which are in (%).

References:

1. For PGX, H451, H327, and HLM: "Graphite Design Manual," GA Document GA906374, Issue A, August 1984 (proprietary)

2. Ash and Li for ATJ: Industrial Graphite Engineering Handbook, Union Carbide, 1970 edition

3. Rest of ATJ: "Mechanical and Chemical Properties Changes of ATJ Graphite After Oxidation in He/Steam Mixture", GA Document DAD14526, Karl Koyama et al, October 1977

TABLE 4

PCRV Dose Rates at 5 Years After Shutdown

Radial	Gamma Dose Rate (R/Hr)
All components (Lg. Reflector through concrete)	9.7E + 1
No large reflectors (Spacers Concrete)	2.3E + 2
Core Barrel - Concrete	2.1E - 2
Liner + Concrete	8.8E - 3
Concrete Only	4.5E - 3
Minus 22" Concrete	6.3E - 6
Minus 24" Concrete	3.4E - 6
Axial Up	
All components (Kaowool Concrete)	1.7E - 1
Liner & Concrete	4.4E - 1
Concrete Only	1.7E - 1
Minus 34" Concrete	4.4E - 6
Minus 36" Concrete	2.6E - 6
Axial Down	
All Components (CSB CSF)	6.1E - 2
Liner + Concrete	2.5E - 1
Concrete	1.8E - 2
Minus 20" Concrete	5.3E - 6
Minus 22" Concrete	2.7E - 6

TABLE 5

PCRV Dose Rates at 60 Years After Shutdown

Radial	Gamma Dose Rate (R/Hr)
All Components (Lg. Reflector - Concrete)	6.9E - 2
No large reflectors (Spacers - Concrete)	1.6E - 1
Core Barrel - Concrete	1.4E - 5
Liner + Concrete	6.2E - 6
Concrete Only	1.1E - 5
Minus 6" Concrete	6.6E - 6
Minus 8" Concrete	3.5E - 6
Minus 10" Concrete	1.7E - 6
Axial Up	
All Components (Kaowool - Concrete)	1.2E - 4
Liner + Concrete	3.1E - 4
Concrete Only	4.5E - 4
Minus 16" Concrete	4.1E - 6
Minus 18" Concrete	2.0E - 6
Axial Down	
All Components (CSB - CSF)	4.3E - 5
Liner + Concrete	1.8E - 4
Concrete	6.6E - 5
Minus 4" Concrete	1.0E - 5
Minus 6" Concrete	4.3E - 6
Minus 8" Concrete	1.8E - 6

TABLE 6
ACTIVATION ANALYSIS RESULTS
(Total Curies Three Years After Shutdown)

Fixed Components:	H-3	C-14	Ca-41	Ca-45	Mn-54	Fe-55	Fe-59	Co-60	Ni-59	Ni-63	Nb-94	Ag-110	Eu-152	Eu-154	Others	Total Curies
1. Core Barrel	-	-	-	-	0.11	7.28	<0.01	1.03	-	-	<0.01	-	-	-	0.01	8.43
2. CSF Liner	-	-	-	-	<0.01	139.98	<0.01	2.27	<0.01	0.04	<0.01	-	-	-	<0.01	142.29
3. PCRV Liner	-	-	-	-	0.08	110.34	<0.01	4.34	<0.01	0.03	<0.01	-	-	-	<0.01	114.78
4. CSF/Kaowool Insulation and Cover Plates	-	<0.01	<0.01	-	<0.01	87.28	<0.01	2.24	<0.01	0.08	-	-	-	-	<0.01	89.52
5. CSF Silica Blocks	-	<0.01	<0.01	-	<0.01	246.54	<0.01	6.33	<0.01	0.22	-	-	-	-	<0.01	253.09
6. PCRV Kaowool Insulation and Cover Plates	-	<0.01	<0.01	-	0.01	5.57	<0.01	0.44	-	-	-	-	-	-	0.01	6.03
7. Metal Shell-Large Side Reflector	-	-	-	-	<0.01	0.01	<0.01	<0.01	-	-	-	-	-	-	<0.01	0.01
8. Large Side Reflector and Permanent Hexagonal Blocks	82557.70	-	20.11	77.44	0.30	441114.00	<0.01	3446.24	-	-	-	-	-		.21	527216.00
9. Core Support Blocks	47.19	-	<0.01	0.01	<0.01	69.15	-	0.54	-	-	-	-	-	-	<0.01	116.89
10. Reflector Keys	-	-	-	-	<0.01	0.01	<0.01	<0.01	-	-	-	-	-	-	<0.01	0.01
11. Boronated Spacer Blocks	11531.50	1.02	0.81	3.12	<0.01	47208.60	<0.01	7097.13	2.81	392.45	-	-	-		0.26	66237.70
TOTAL																596,184.75
Removable Components:																
1. Metal Clad Block-CR	-	-	-	-	0.06	18451.70	<0.01	4342.78	2.08	290.39	0.18	-	-	-	0.01	23087.20
2. Metal Clad Block-NCR	-	-	-	-	0.52	169668.20	<0.01	2786.29	-	-	<0.01	-	-	-	<0.01	172454.44
3. Region Constraint Device	-	-	-	<0.01	0.07	71.85	<0.01	48.93	0.01	1.27	C.01	-	-	-	<0.01	122.13
4. Orifice Valve	-	-	-	-	0.17	299.25	<0.01	115.56	-	-	-	-	-	-	<0.01	414.98
5. Reflector Block with Hastelloy Cans	1.38	-	-	<0.01	0.07	301.45	<0.01	3407.48	0.67	88.35	<0.01	-	-	-	<0.01	3799.40
TOTAL																199,878.15

TABLE 6 (Continued)

Component/Isotope	H-3	C-14	Ca-41	Ca-45	Mn-54	Fe-55	Fe-59	Co-60	Ni-59	Ni-63	Nb-94	Ag-110	Eu-152	Eu-154	Others	Total
Concrete Radial:																
1st Six Inches	0.26	<0.01	<0.01	0.02	<0.01	7.93	<0.01	0.31	<0.01	<0.01	<0.01	<0.01	0.31	0.03	0.03	8.89
2nd Six Inches	0.09	<0.01	<0.01	<0.01	<0.01	2.81	<0.01	0.10	<0.01	<0.01	<0.01	<0.01	0.11	<0.01	0.02	3.13
3rd Six Inches	0.01	<0.01	<0.01	<0.01	<0.01	0.33	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.01	0.37
4th Six Inches	<0.01	<0.01	<0.01	<0.01	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.04
5th Six Inches	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
6th Six Inches	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
7th Six Inches	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
8th Six Inches	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
TOTAL																12.44
Concrete - Top Head:																
1st Six Inches	2.84	<0.01	0.04	0.18	0.01	87.79	<0.01	3.37	<0.01	<0.01	<0.01	0.01	3.45	0.35	0.28	98.32
2nd Six Inches	0.73	<0.01	0.01	0.05	<0.01	22.95	<0.01	0.79	<0.01	<0.01	<0.01	<0.01	0.90	0.08	0.04	25.55
3rd Six Inches	0.07	<0.01	<0.01	<0.01	<0.01	2.26	<0.01	0.08	<0.01	<0.01	<0.01	<0.01	0.09	0.01	0.01	2.52
4th Six Inches	0.01	<0.01	<0.01	<0.01	<0.01	0.24	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	0.27
5th Six Inches	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.04
6th Six Inches	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
7th Six Inches	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
8th Six Inches	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
TOTAL																126.71
Concrete - CSF:																
1st Six Inches	0.16	<0.01	<0.01	0.01	<0.01	5.12	<0.01	0.17	<0.01	<0.01	<0.01	<0.01	0.20	0.02	0.01	5.69
2nd Six Inches	0.01	<0.01	<0.01	<0.01	<0.01	0.34	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.01	0.38
3rd Six Inches	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.03
4th Six Inches	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
5th Six Inches	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
6th Six Inches	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
7th Six Inches	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
8th Six Inches	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
9th Six Inches	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
10th Six Inches	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
TOTAL																6.10

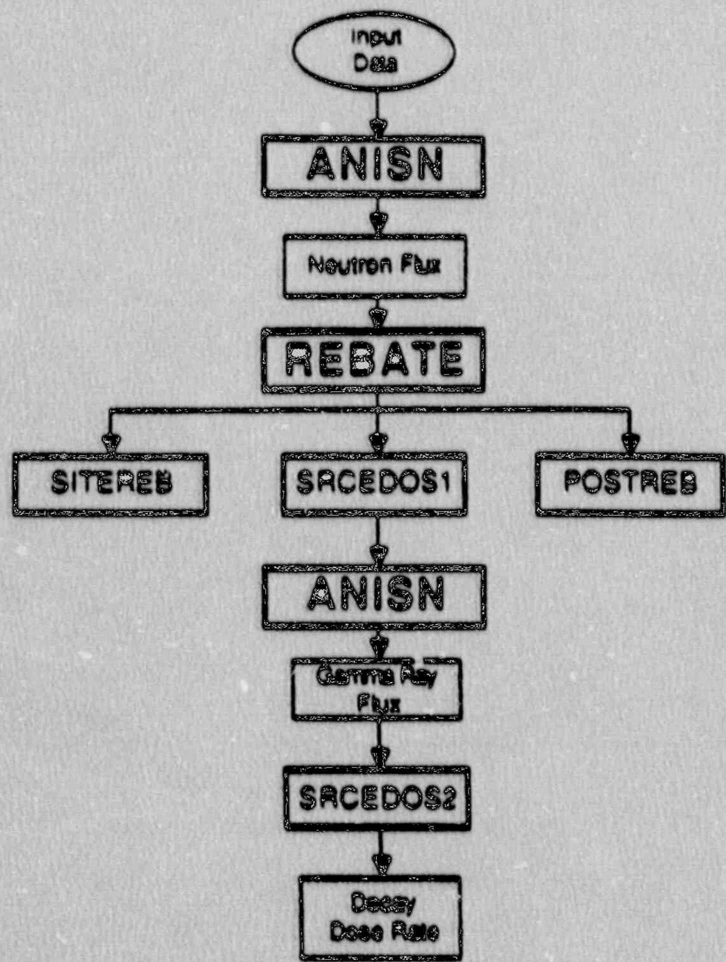
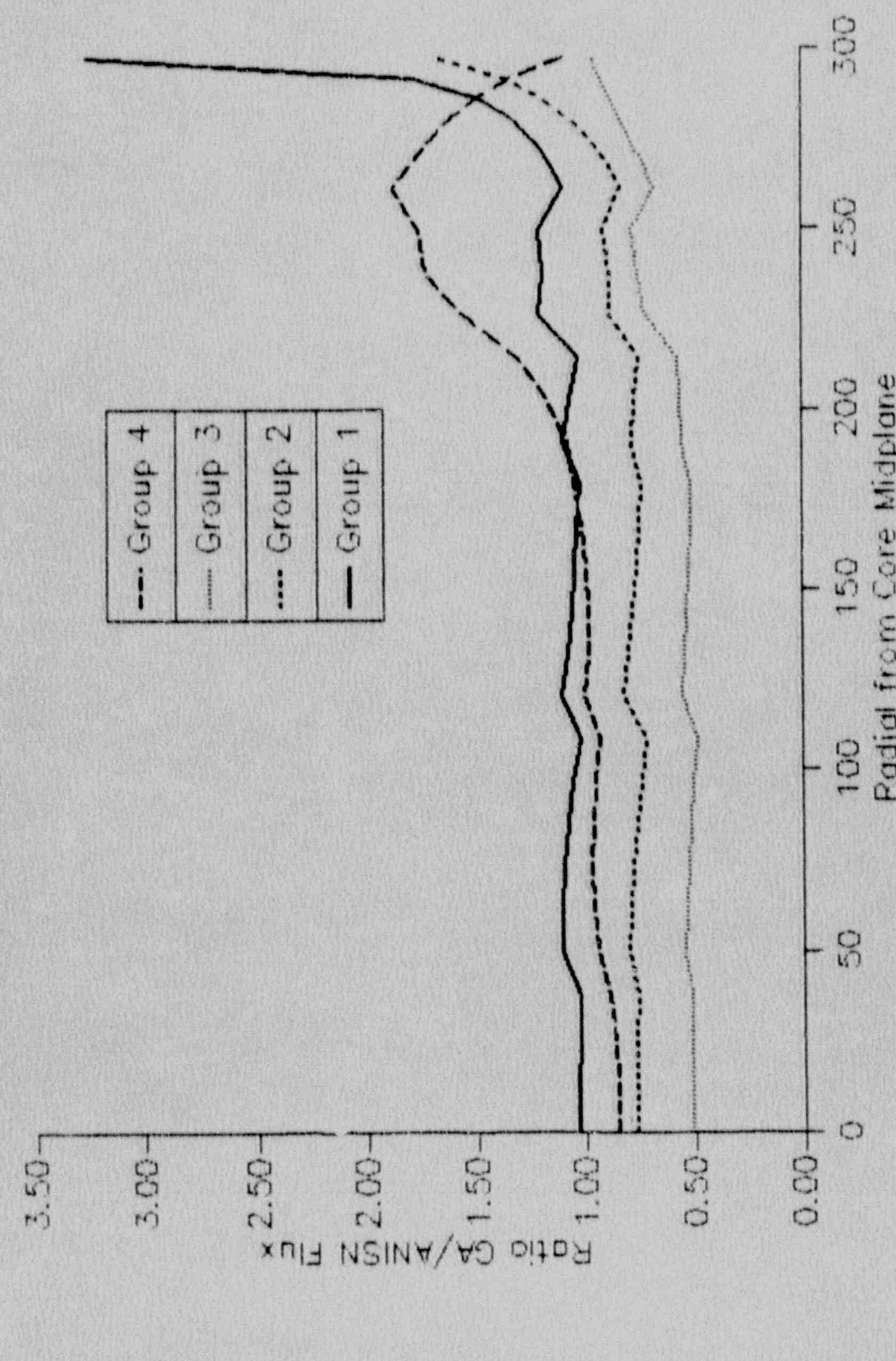


Figure 1
Calculational Sequence Flow Chart

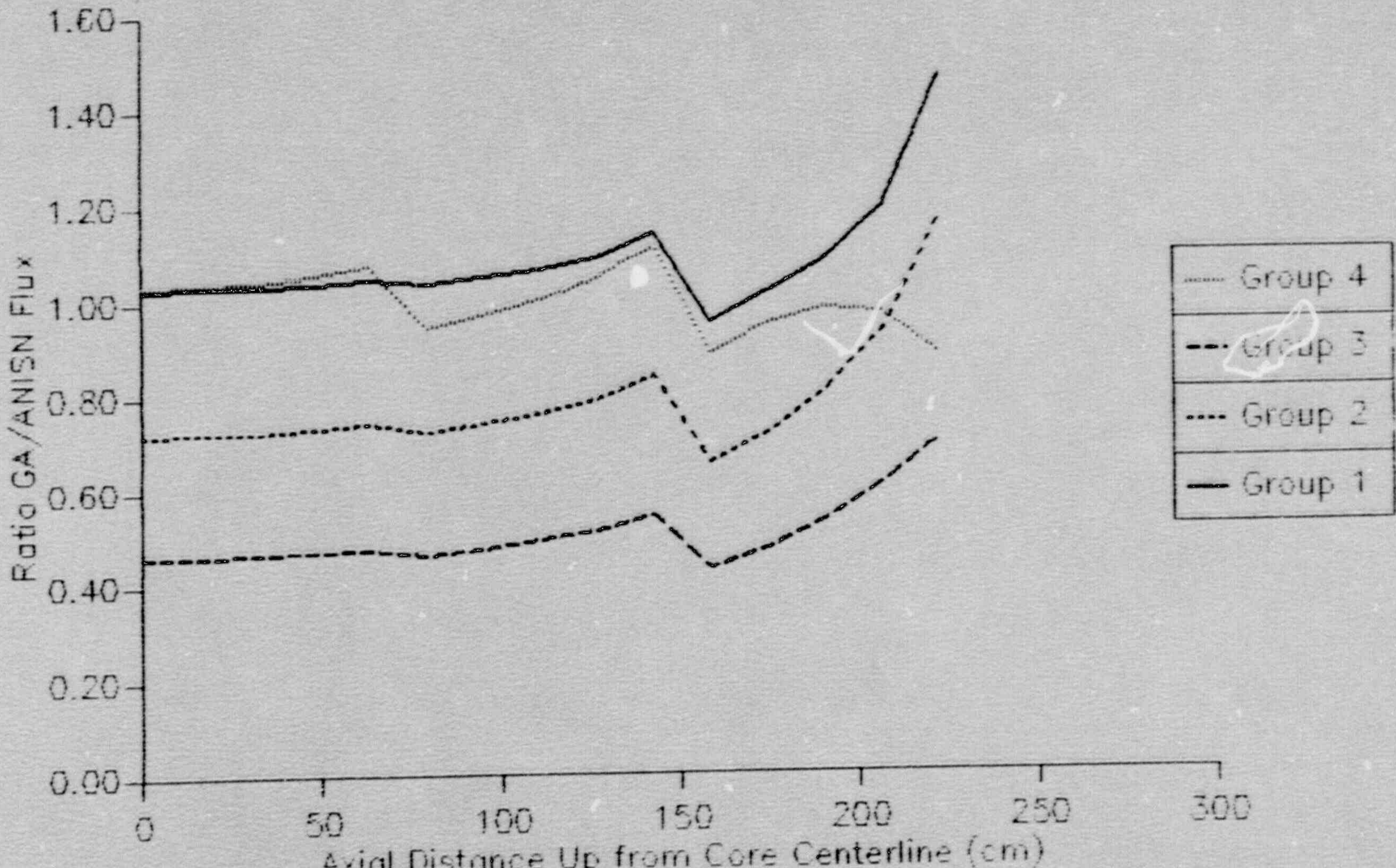
ICU File: TR2941RATIOR04)

Figure 2
Radial Flux Ratios



ICU File: TB284(RATIOUP4)

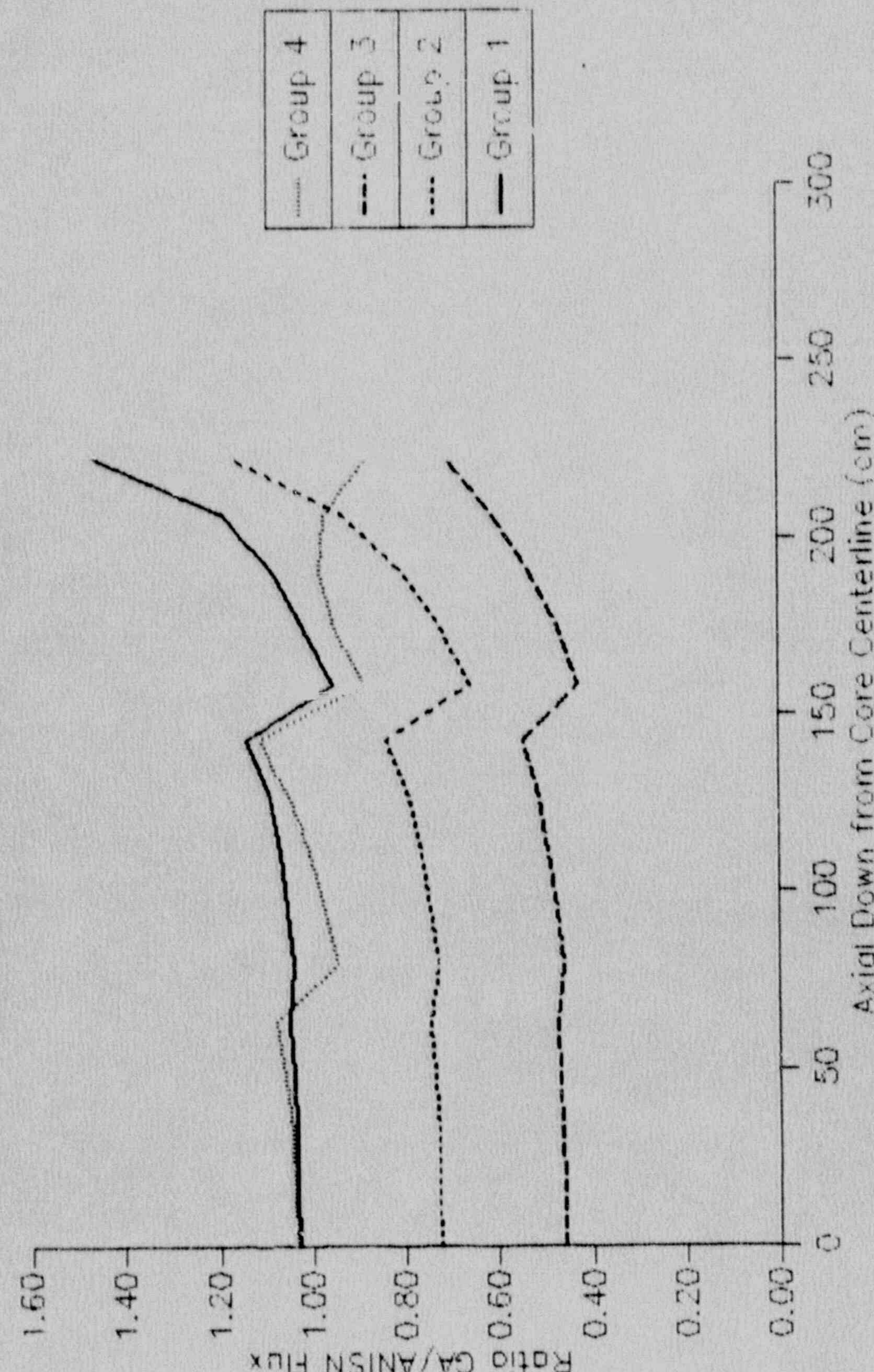
Figure 3
Axial Up Flux Ratios



EE-DEC-0010
REV. B
Page 28

ICU File: T92844(RATIO0N4)

Figure 4
Axial Down Flux Ratios



ICU File: TB284(FLU)RAD4)

Figure 5
Radial Flux Traverse

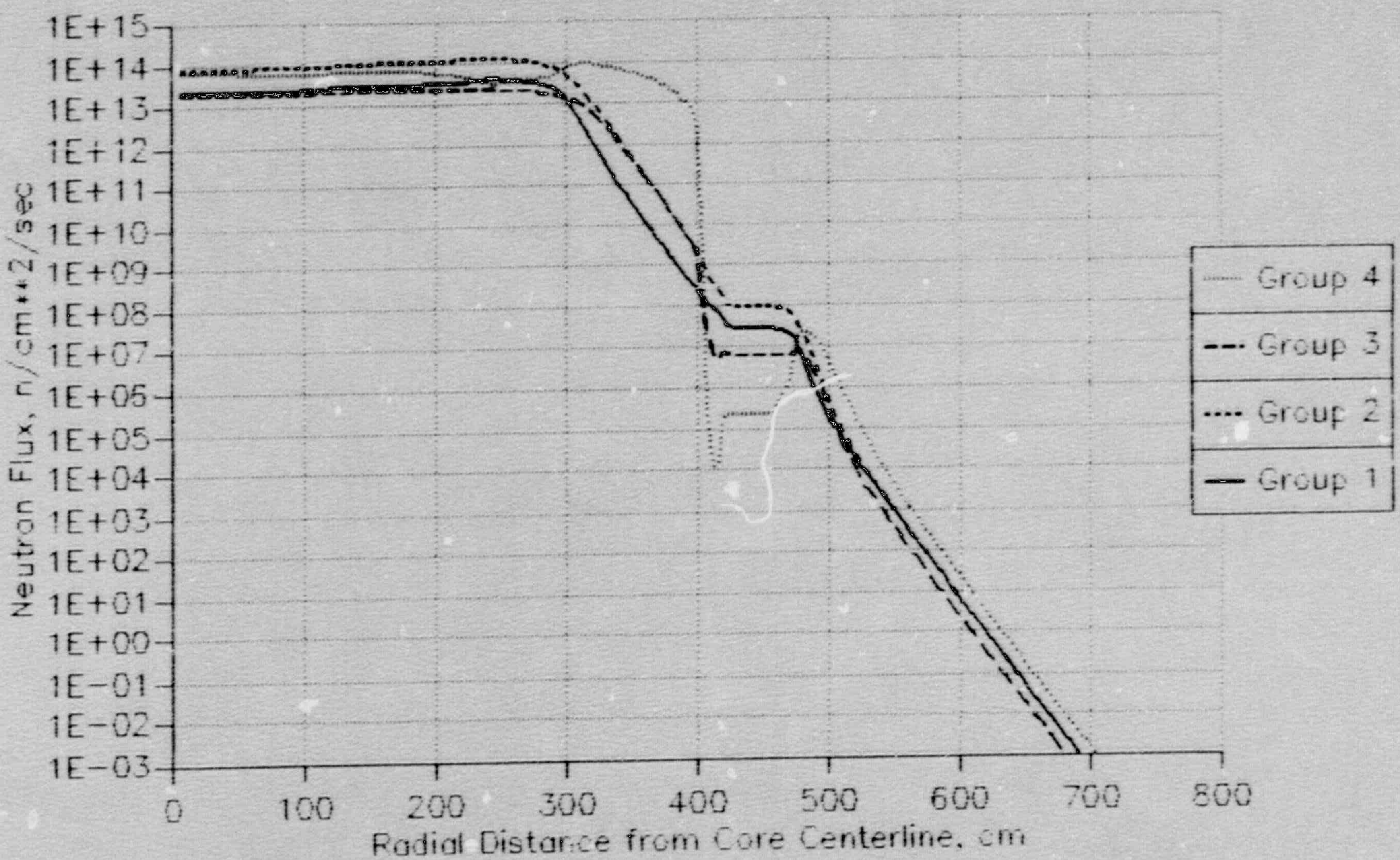
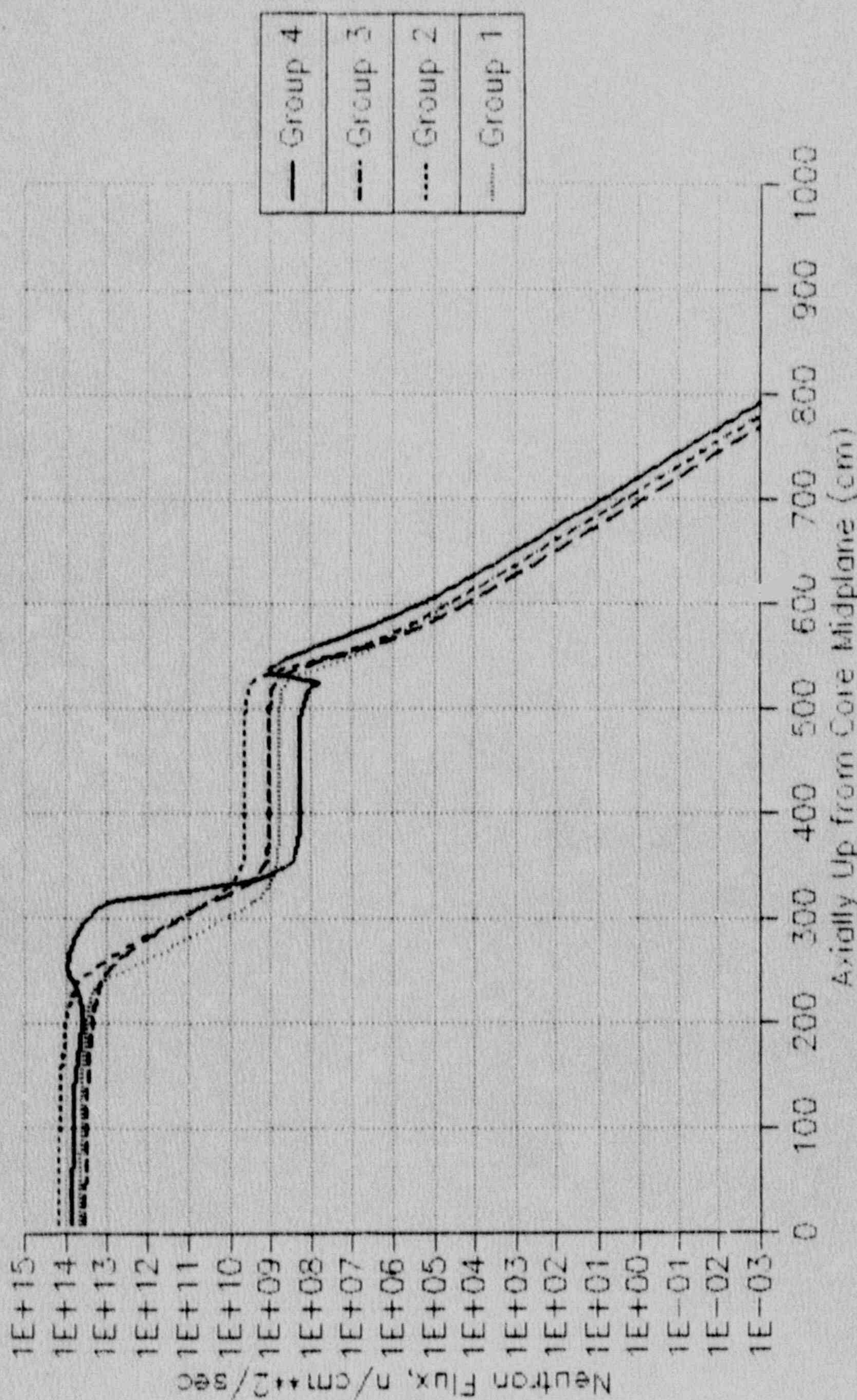
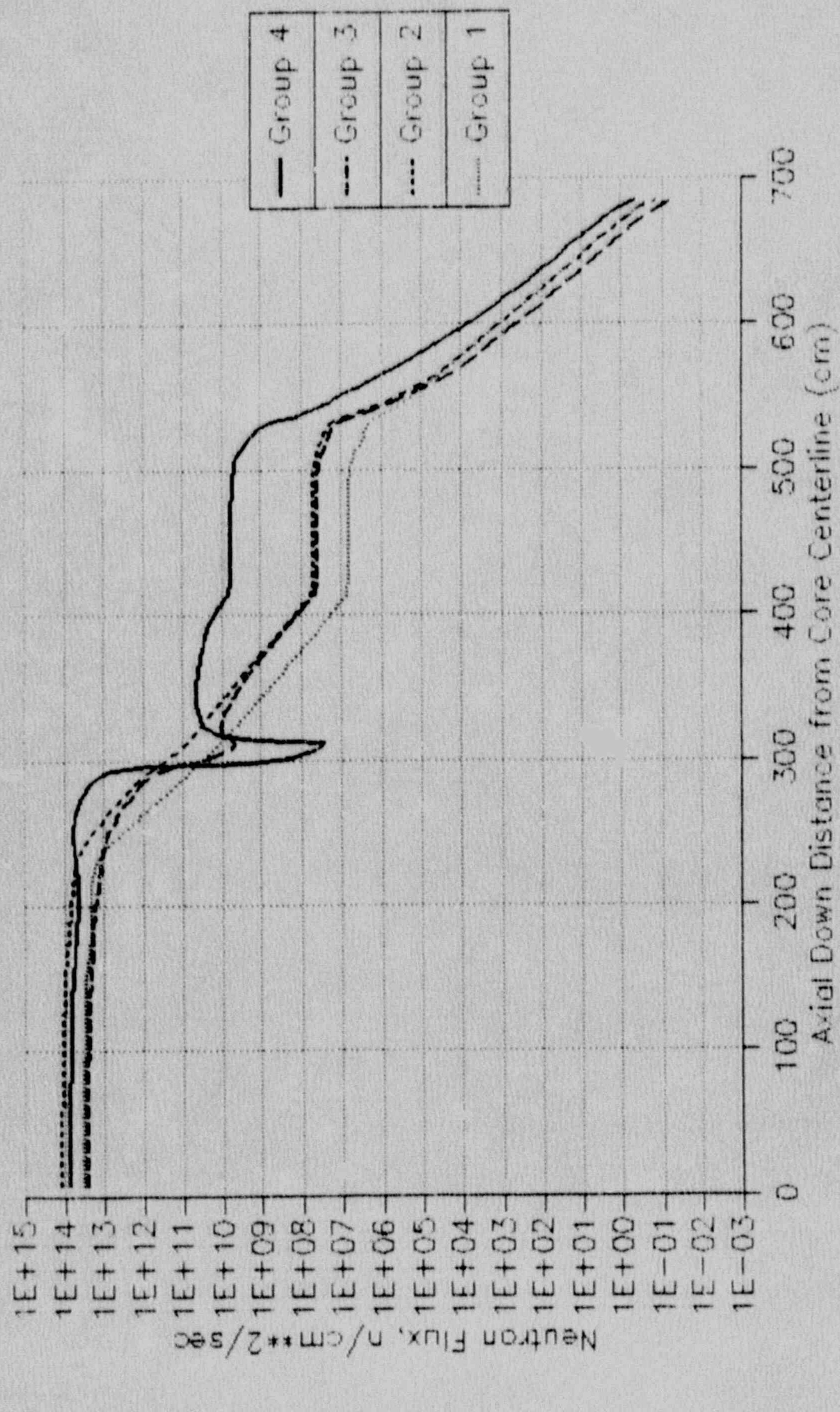


Figure 6
Axial Up Flux Traverse



KCU File: T8284(FLUX)8484)

Figure 7
Axial Down Flux Traverse



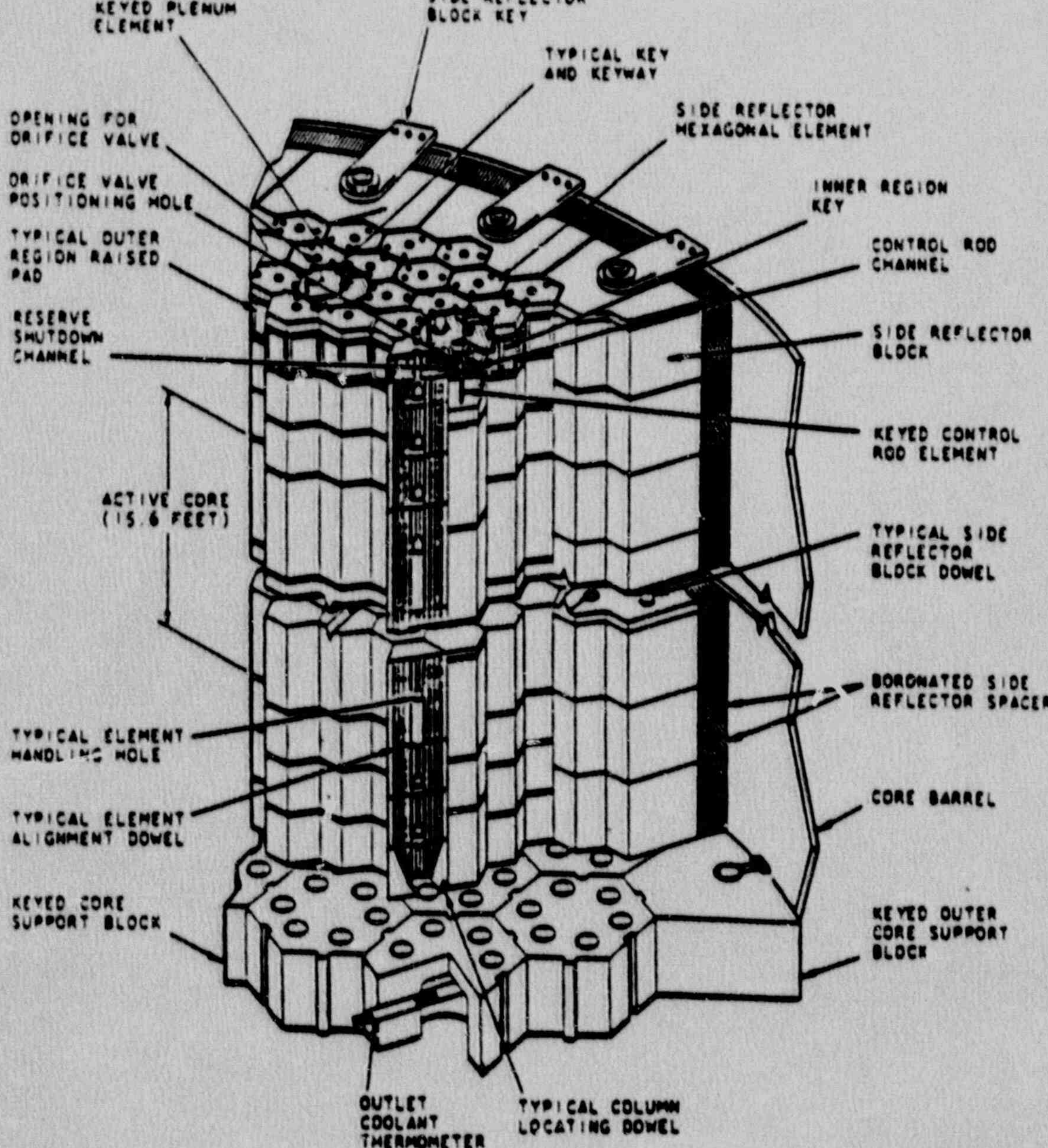


Figure 8
Core Arrangement

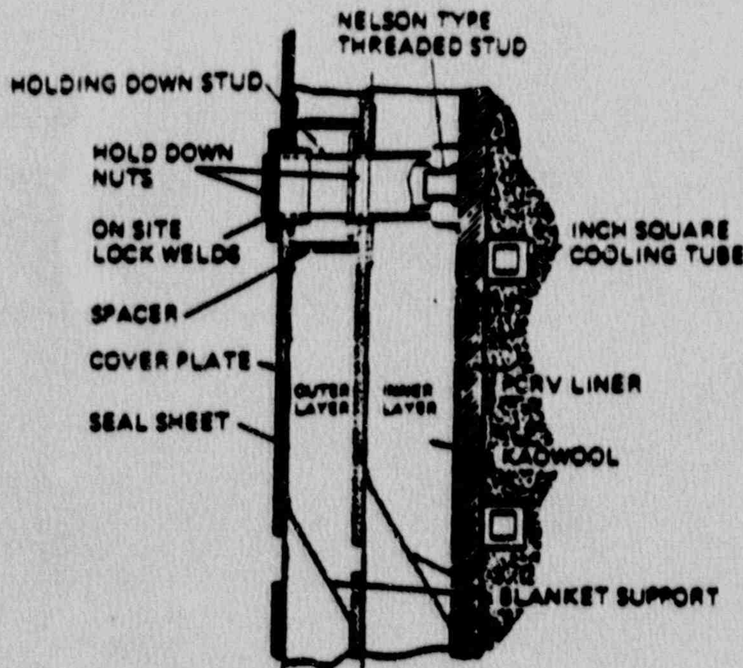


Figure 9
Class A Insulation

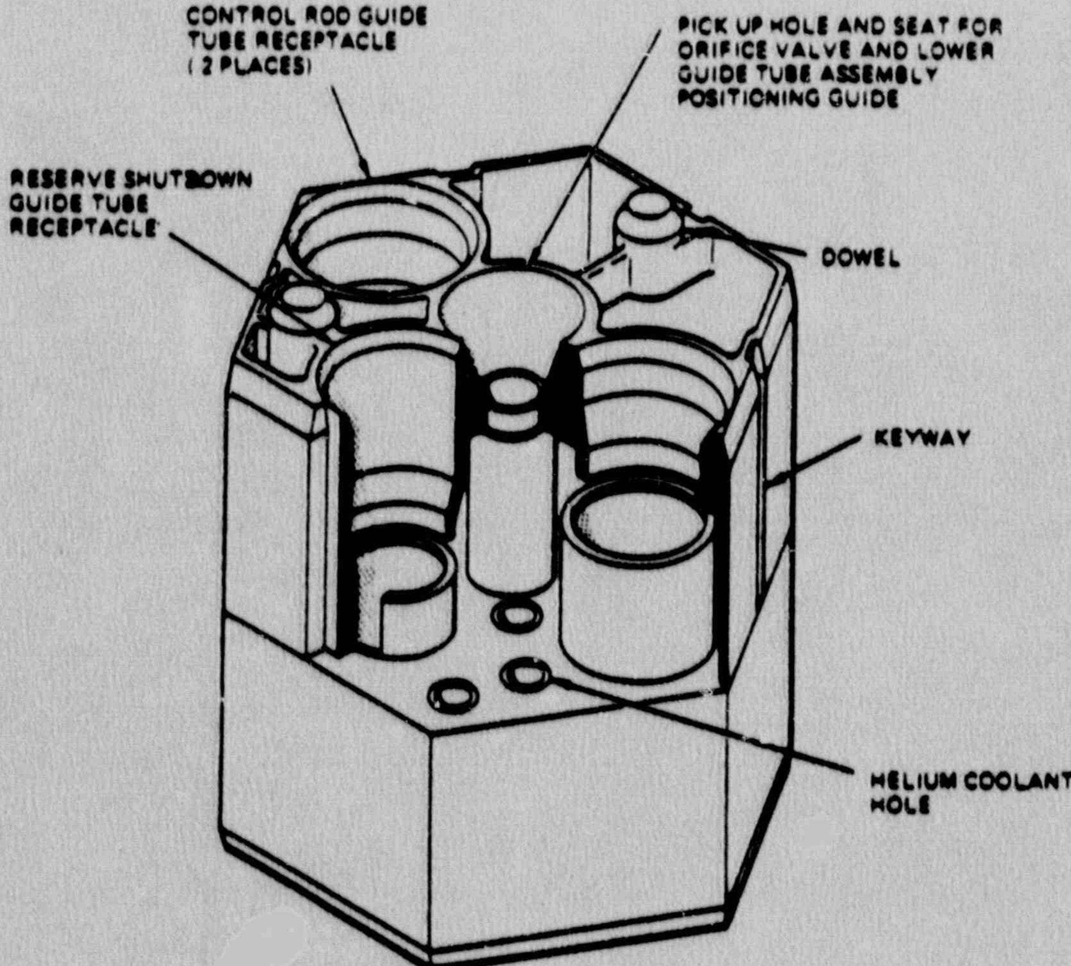


Figure 10
Central Column Metal Clad Reflector

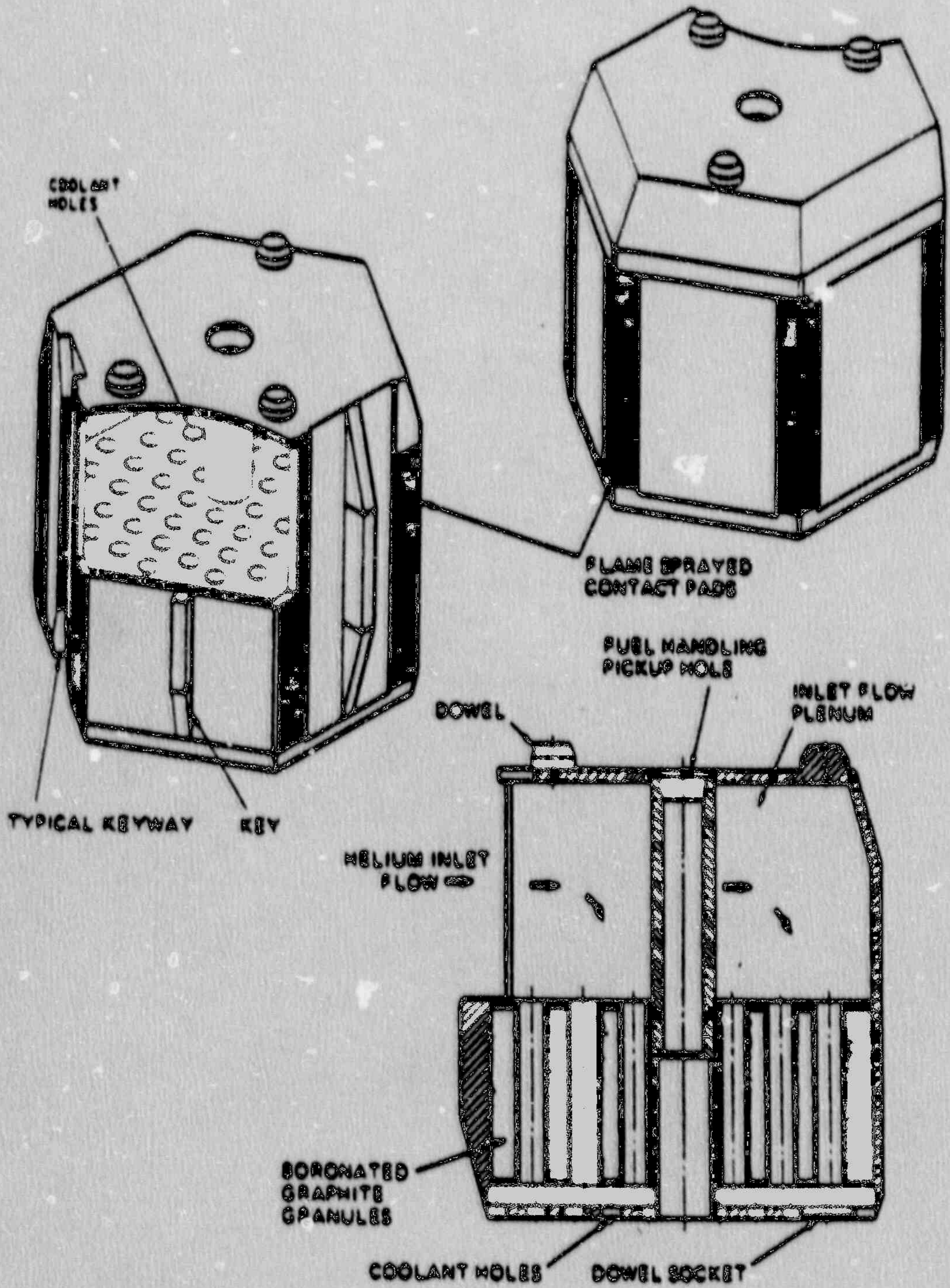


Figure 11
Side Column Metal Clad Reflector

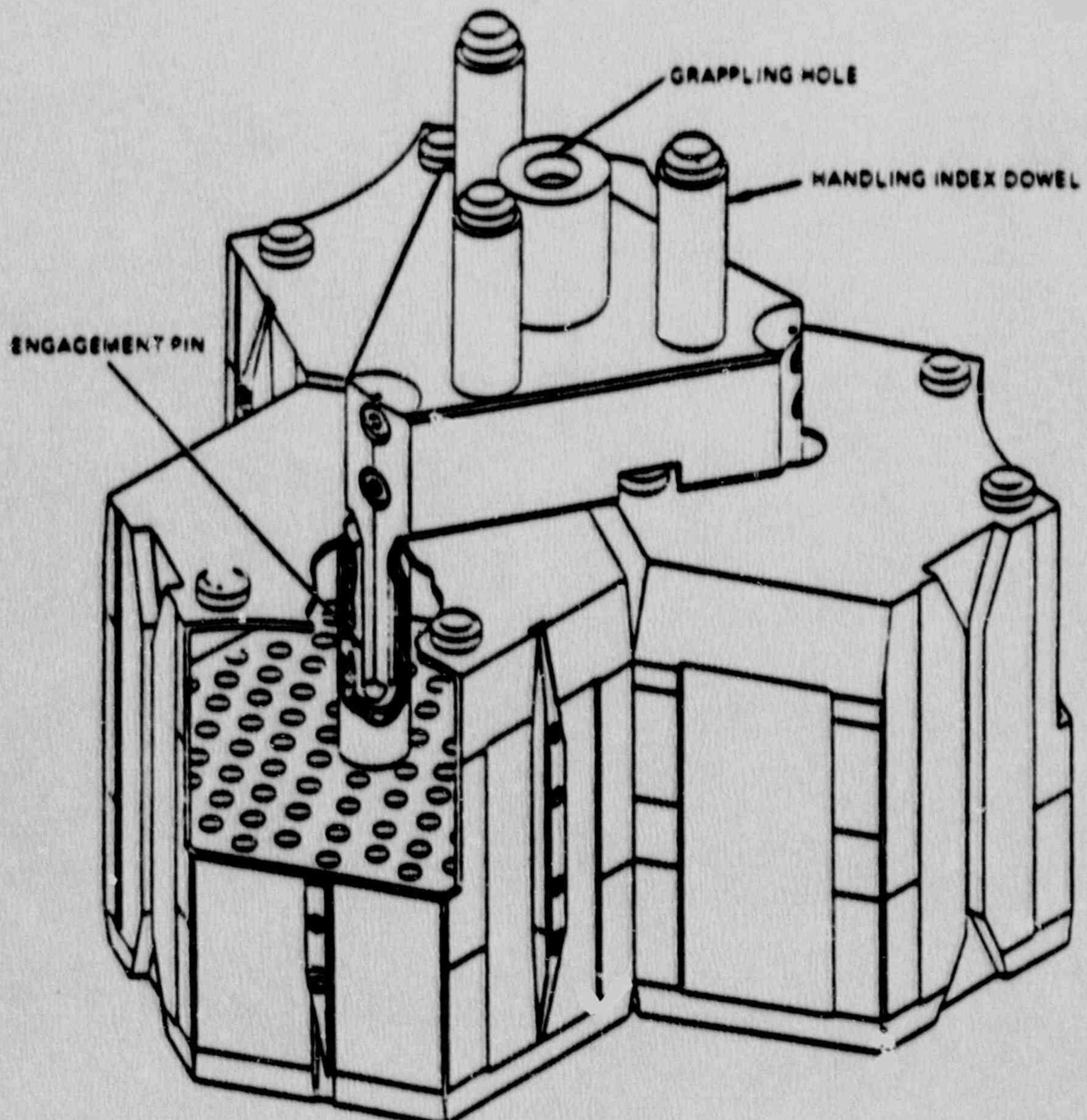


Figure 12
Region Constraint Device

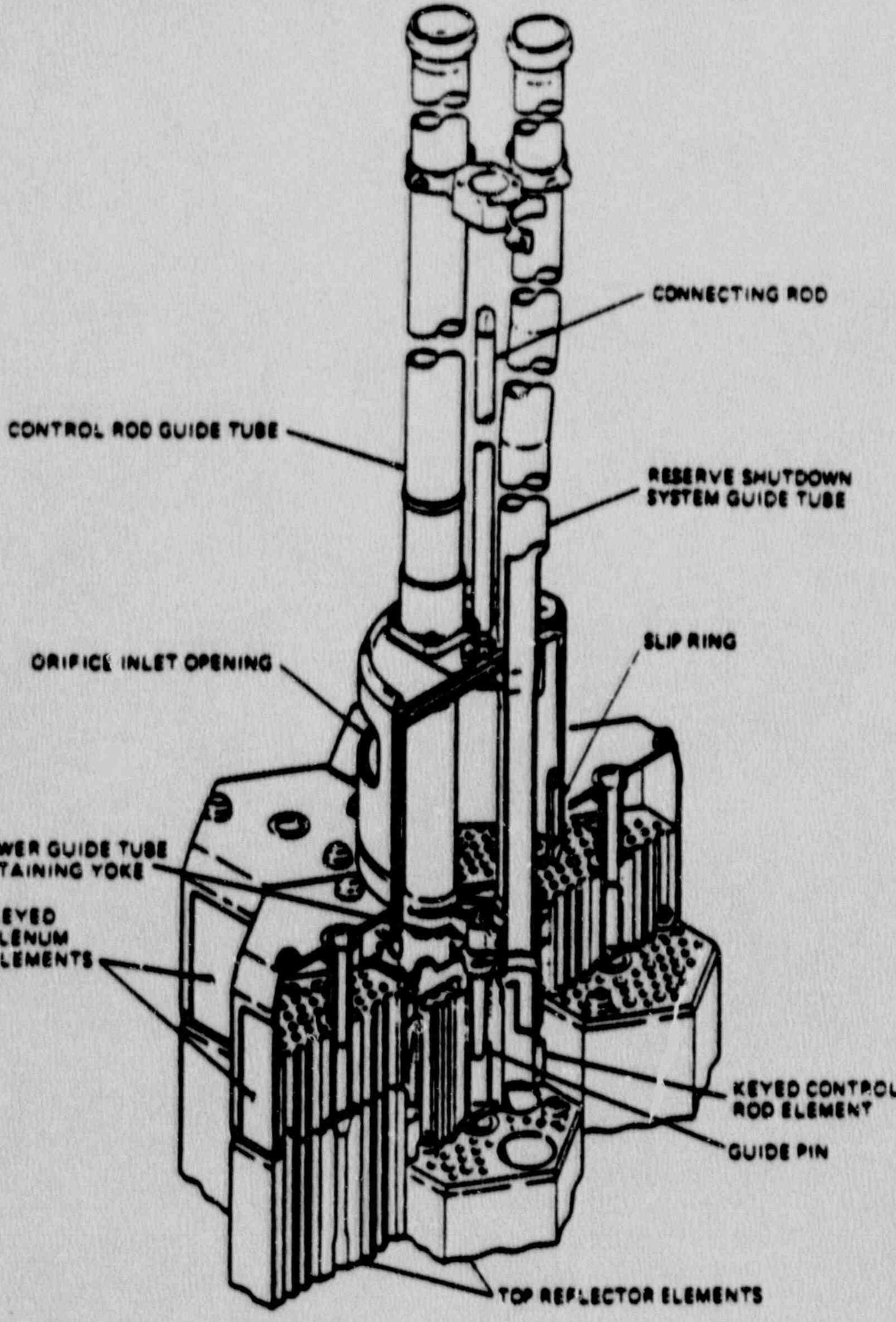


Figure 13
Lower Orifice .alve Assembly

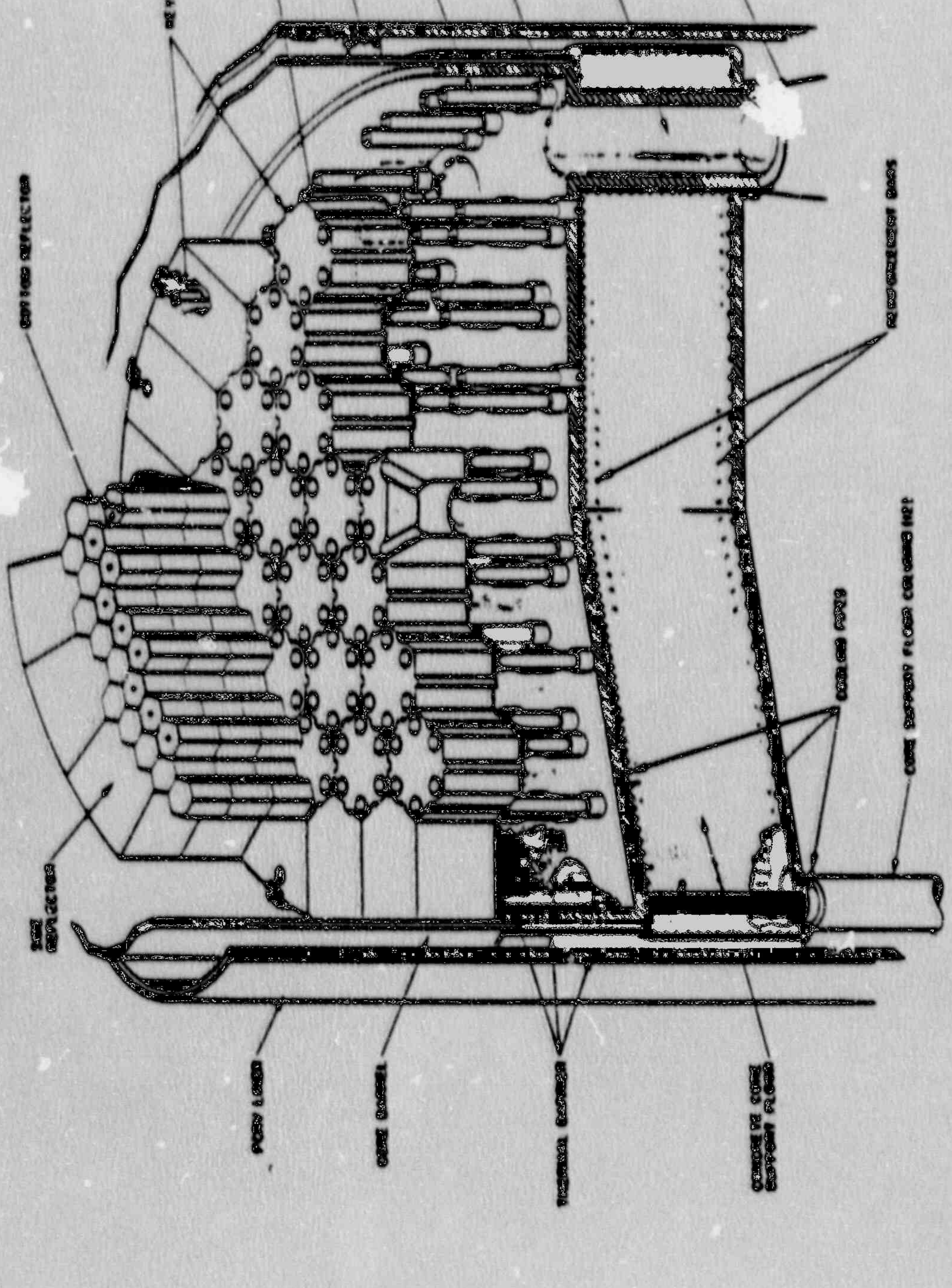


Figure 14
Core Support Arrangement

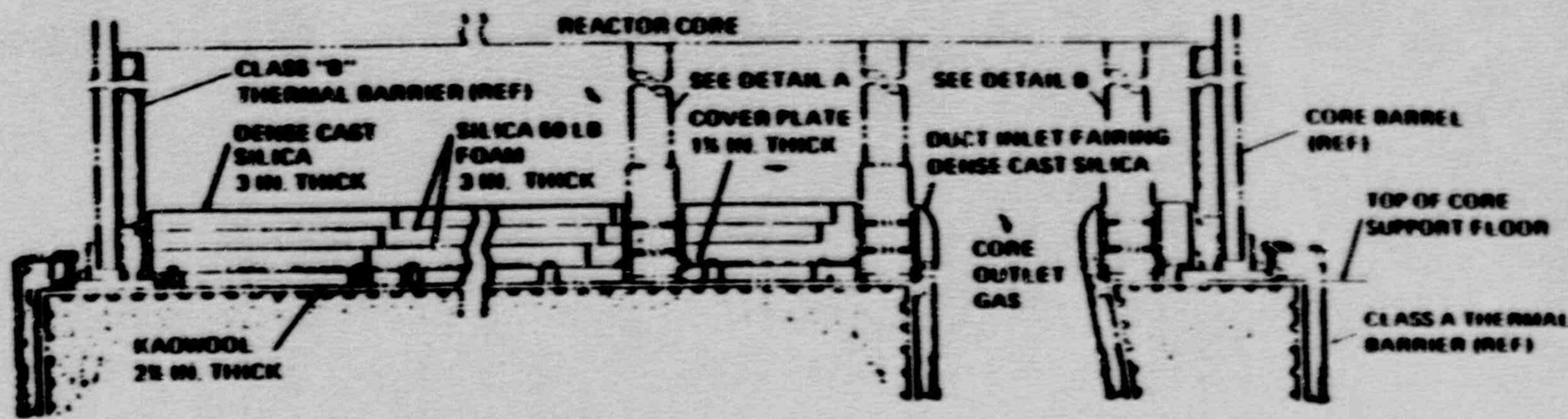


Figure 15
Class C Insulation

Appendices

EE-DEC-0010

REV B

Fort St. Vrain Activation Analysis

Appendix B
EE-DEC-0010

Material Composition Data Base

FORM (A)292 12

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TTTTTTTTTTTT        11      3333333333    6666666666    8888888888     AAAAAAAAAA
TTTTTTTTTTTT       111     333333333333  666666666666  888888888888   AAAAAAAAAAAA
     TT           1111     33        33  66        66  88        88   AA        AA
     TT             11               33  66            88        88   AA        AA
     TT             11               33  66             88      88    AA        AA
     TT             11             3333  66666666666     88888888     AAAAAAAAAAAA
     TT             11             3333  666666666666    88888888     AAAAAAAAAAAA
     TT             11               33  66        66   88      88    AA        AA
     TT             11               33  66        66  88        88   AA        AA
     TT             11     33        33  66        66  88        88   AA        AA
     TT         1111111111 333333333333  666666666666  888888888888   AA        AA
     TT         1111111111  3333333333    6666666666    8888888888    AA        AA
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 JJJJJJJJJ  000000000000  BBBBBBBBBBB    00000000      00000000        11      2222222222    9999999999
 JJJJJJJJJ  000000000000  BBBBBBBBBBBB  0000000000    0000000000      111     222222222222  999999999999
        JJ  00        00  BB        BB  00      0000  00      0000   1111     22        22  99        99
        JJ  00        00  BB        BB  00     00 00  00     00 00     11               22  99        99
        JJ  00        00  BB       BB   00    00  00  00    00  00     11               22  99        99
        JJ  00        00  BBBBBBBBBB    00   00   00  00   00   00     11              22   999999999999
        JJ  00        00  BBBBBBBBBB    00  00    00  00  00    00     11            22     999999999999
        JJ  00        00  BB       BB   00 00     00  00 00     00     11          22                 99
 JJ     JJ  00        00  BB        BB  0000      00  0000      00     11        22                   99
 JJ     JJ  00        00  BB        BB  000       00  000       00     11      22           99        99
 JJJJJJJJ   000000000000  BBBBBBBBBBBB  0000000000    0000000000   1111111111  222222222222  999999999999
  JJJJJJ    000000000000  BBBBBBBBBBB    00000000      00000000    1111111111  222222222222   9999999999
```

```
  AAAAAAAAAA
 AAAAAAAAAAAA
 AA        AA
 AA        AA
 AA        AA
 AAAAAAAAAAAA
 AAAAAAAAAAAA
 AA        AA
 AA        AA
 AA        AA
 AA        AA
 AA        AA
```

Diam Hill

```
*START  JOB00129  T1368A   1      001 001 LOCAL   1368 VW DIAMOND HILL ROOM      9.00.16 AM 11 JUL 89 PRT15    DDDD START A*
*START  JOB00129  T1368A   1      001 001 LOCAL   1368 VW DIAMOND HILL ROOM      9.00.16 AM 11 JUL 89 PRT15    DDDD START A*
*START  JOB00129  T1368A   1      001 001 LOCAL   1368 VW DIAMOND HILL ROOM      9.00.16 AM 11 JUL 89 PRT15    DDDD START A*
*START  JOB00129  T1368A   1      001 001 LOCAL   1368 VW DIAMOND HILL ROOM      9.00.16 AM 11 JUL 89 PRT15    DDDD START A*
*START  JOB00129  T1368A   1      001 001 LOCAL   1368 VW DIAMOND HILL ROOM      9.00.16 AM 11 JUL 89 PRT15    DDDD START A*
*START  JOB00129  T1368A   1      001 001 LOCAL   1368 VW DIAMOND HILL ROOM      9.00.16 AM 11 JUL 89 PRT15    DDDD START A*
*START  JOB00129  T1368A   1      001 001 LOCAL   1368 VW DIAMOND HILL ROOM      9.00.16 AM 11 JUL 89 PRT15    DDDD START A*
*START  JOB00129  T1368A   1      001 001 LOCAL   1368 VW DIAMOND HILL ROOM      9.00.16 AM 11 JUL 89 PRT15    DDDD START A*
*START  JOB00129  T1368A   1      001 001 LOCAL   1368 VW DIAMOND HILL ROOM      9.00.16 AM 11 JUL 89 PRT15    DDDD START A*
*START  JOB00129  T1368A   1      001 001 LOCAL   1368 VW DIAMOND HILL ROOM      9.00.16 AM 11 JUL 89 PRT15    DDDD START A*
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Appendix B
ZE-DEC-0010

```
                 J E S 2  J O B  L O G  --  S Y S T E M  D D D D  --  N O D E  L O O K O U T

-------- JOB00129  IEF097I T1368A   - USER T8284     ASSIGNED
09.00.04 JOB00129  TSS701I T8284     LAST-USED 11 JUL 89 08:55 SYSTEM=DDDD FACILITY=BATCH
09.00.04 JOB00129  TSS702I COUNT=03532  MODE=WARN  LOCKTIME=NONE NAME=FISHER, STEVE
09.00.04 JOB00129  $HASP373 T1368A   STARTED - INIT 62 - CLASS A - SYS DDDD
09.00.14 JOB00129  * T1368A   001 SAS        SASLPA      ----------- R000
09.00.15 JOB00129  * T1368A     1      6311      6.51    -----------  EOJ
09.00.15 JOB00129  $HASP395 T1368A   ENDED

------ JES2 JOB STATISTICS ------

    11 JUL 89 JOB EXECUTION DATE

           58 CARDS READ

        1,101 SYSOUT PRINT RECORDS

            0 SYSOUT PUNCH RECORDS

           97 SYSOUT SPOOL KBYTES

         0.1_ MINUTES EXECUTION TIME
```

```
1 //T1368A JOB (12,4821-63-56),'1368 VW DIAMOND HILL',                JOB00129
  //          MSGLEVEL=(0,0),CLASS=A,MSGCLASS=A,NOTIFY=T1360           00020000
```

```
TSS701I T8284    LAST-USED 11 JUL 89 08:55 SYSTEM=DDDD FACILITY=BATCH
TSS702I COUNT=03532  MODE=WARN  LOCKTIME=NONE NAME=FISHER, STEVE
IEF142I T1368A SAS - STEP WAS EXECUTED - COND CODE 0000
IEF373I STEP /SAS     / START 89192.0900
IEF374I STEP /SAS     / STOP  89192.0900 CPU    0MIN 00.30SEC SRB    0MIN 00.04SEC VIRT  1664K SYS   192K EXT       4K SYS    9012K
************************************ S T E P   T E R M I N A T I O N ************************************
*    JOB    STP   STEP       PGM      STARTED        ENDED         TCB       SRB    ELAPSED   SWAP  CORE    COMP *
*   NAME     #    NAME       NAME      TIME          TIME        SECONDS   SECONDS  SECONDS   COUNT USED    CODE *
* T1368A    001 SAS       SASLPA   09:00:04.96 09:00:14.19        .30       .04      9.23      0  1856K   R000 *
**************************************************************************************************************
*                   SWAP     SWAP       VIO       VIO        TCB       I/O       MSU       SRB       TOTAL     *
*  PAGEINS PAGEOUTS  PAGEINS PAGEOUTS  PAGEINS PAGEOUTS      S U       S U       S U       S U       S U       *
*        0        0        0        0        0        0     1851      1540      2688       232      6311      *
**************************************************************************************************************
IEF375I  JOB /T1368A  / START 89192.0900
IEF376I  JOB /T1368A  / STOP  89192.0900 CPU    0MIN 00.30SEC SRB    0MIN 00.04SEC
************************************* J O B   T E R M I N A T I O N *****************************************
*     JOB  PERF    TOTAL    ACTIVE    STARTED       ENDED         TCB       SRB   ELAPSED   TOTAL              *
*    NAME   GRP     S U     SECONDS    TIME          TIME        SECONDS  SECONDS SECONDS   SWAPS              *
* T1368A     1      6311      6.51 09:00:04.96 09:00:14.99        .30       .04    10.03      0                *
**************************************************************************************************************
```

```
1         SAS(R) LOG    OS SAS 5.18            MVS/XA JOB T1368A    STEP SAS                    9:00 TUESDAY, JULY 11, 1989

NOTE: COPYRIGHT (C) 1984,1988 SAS INSTITUTE INC., CARY, N.C.  27512, U.S.A.
NOTE: THE JOB T1368A HAS BEEN RUN UNDER RELEASE 5.18 OF SAS AT PUBLIC SERVICE COMPANY OF COLORADO (01298001).

NOTE: SAS OPTIONS SPECIFIED ARE:
       SORT=4

BASE SAS PRODUCT NEWS:

YOU ARE RUNNING THE VERSION 5 MAINTENANCE RELEASE OF THE SAS SYSTEM (5.18).


DATA TEMP;
  SET SASDAT.ACTANAL;
  ARRAY ELEMS (17) ELEM1-ELEM17;
  ARRAY WEIGHTS (17) WEIGHT1-WEIGHT17;
  ARRAY NUMS (17) NUM1-NUM17;
  FILE PRINT HEADER=TOPPAGE;
  PUT _PAGE_;
  PUT @26 'COMPONENT:  ' COMP $68.;
  PUT @26 'LOCATION:  ' LOC $6. @52 'FIXED OR REMOVABLE:  ' FIXED $2.;
  PUT @26 'DESC: ' DESC $69.;
  PUT @36 DESC2 $69.;
  PUT @26 'REF DWGS: ' REFDWG1 $69.;
  PUT @36 REFDWG2 $69.;
  PUT @36 REFDWG3 $69.;
  PUT @36 REFDWG4 $69.;
  PUT @36 REFDWG5 $69.;
  PUT @26 'COMPOSITION REF:   ' COMPREF $60.;
  PUT @26 'COMPONENT VOLUME (CM**3):';
  PUT @45 COMPVOL E12. +1 VOLNOTE $20.
      +2 COMPVOL2 E12. +1 VOLNOTE2 $20.;
  PUT @45 COMPVOL3 E12. +1 VOLNOTE3 $20.
      +2 COMPVOL4 E12. +1 VOLNOTE4 $20.;
  PUT @45 COMPVOL5 E12. +1 VOLNOTE5 $20.
      +2 COMPVOL6 E12. +1 VOLNOTE6 $20.;
  PUT @45 COMPVOL7 E12. +1 VOLNOTE7 $20.
      +2 COMPVOL8 E12. +1 VOLNOTE8 $20.;
  PUT @26 'COMPONENT DENSITY (G/CM2):  ';
  PUT @45 DENSITY E12. +1 DENNOTE1 $20. +2 DENSITY2 E12. +1
      DENNOTE2 $20.;
  PUT @45 DENSITY3 E12. +1 DENNOTE3 $20. +2 DENSITY4 E12. +1
      DENNOTE4 $20.;
  PUT @26 'CALCULATION NUMBERS:   '  CALCNO 3. +2 CALCNO2 3. +2
    CALCNO3 3.;
  PUT ;
  PUT @38 'ELEMENT' @51 'WEIGHT FRACTION' @74 'NUMBER DENSITY';
  DO I = 1 TO 17
    PUT @40 ELEMS(I) $2. @54 WEIGHTS(I) 8.5 @75 NUMS(I) E12.;
  END;
  PUT;
  PUT @26 'COMMENTS: ' COMMENT $69.;
  PUT @36 COMMENT2 $69.;
  PUT @36 COMMENT3 $69.;
RETURN;
TOPPAGE:
  PUT /
```

```
46          PUT @53 'ACTIVATION ANALYSIS DATA';                    00560000
47          PUT ;                                                  00570000
48          PUT ;                                                  00580000
49        RETURN;                                                  00590000

NOTE: AT LEAST ONE W.D FORMAT WAS TOO SMALL FOR THE NUMBER TO
      BE PRINTED. THE DECIMAL POINT MAY BE SHIFTED BY THE
      'BEST' FORMAT.
NOTE: 969 LINES WERE WRITTEN TO FILE PRINT.
NOTE: DATA SET WORK.TEMP HAS 26 OBSERVATIONS AND 97 VARIABLES. 28 OBS/TRK.
NOTE: THE DATA STATEMENT USED 0.20 SECONDS AND 776K AND PRINTED PAGES 1 TO 26.
NOTE: SAS USED 776K MEMORY.

NOTE: SAS INSTITUTE INC.
      SAS CIRCLE
      PO BOX 8000
      CARY, N.C. 27512-8000
```

ACTIVATION ANALYSIS DATA

COMPONENT: HASTELLOY-X CANS AND GRAPHITE (H-451) BLOCK
LOCATION: B FIXED OR REMOVABLE: R
DESC: BORONATED CANS IN BOTTOM REFLECTORS (NON CONTROL ROD ONLY)
TUBES ONLY - DOES NOT INCLUDE END CAPS
REF DWGS; 90R1701-274, ISSUE E 90R1701-272
-355
-330
-440
-275
COMPOSITION REF: AMS-5588B
COMPONENT VOLUME (CM**3):
4.13000E+00 ONE CAN
8.28520E+04 TOTAL CORE

COMPONENT DENSITY (G/CM2):
8.23000E+00 MET HAND

CALCULATION NUMBERS: C05 V03

ELEMENT	WEIGHT FRACTION	NUMBER DENSITY (atoms/cc)	* Element	Graphite Number Density ** (atoms/cc)
CR	0.22000	2.09700E+22	B	1.59 E-7
NI	0.49000	4.13700E+22	Fe	1.30 E-7
CO	0.01500	1.26200E+21	Va	1.11 E-7
MO	0.09000	4.65000E+21	Ti	1.01 E-7
W	0.00600	1.61800E+20	Si	1.01 E-6
AL	0.02000	3.67400E+21	S	7.53 E-8
FE	0.15800	1.40200E+22	Li	4.18 E-9
C	0.00150	6.19000E+20	Co	1.23 E-11

COMMENTS: * Metal Only
** Graphite Number densities - weighted, see C-06 App. C

ACTIVATION ANALYSIS DATA

COMPONENT: REFLECTOR BLOCK KEY
LOCATION: FIXED OR REMOVABLE:
DESC: KEY FOR THE CORE BARREL AND LARGE METAL CLAD SIDE REFLECTOR

REF DWGS; R1105-705 SHTS 1&2

COMPOSITION REF: ASME-SA201GB
COMPONENT VOLUME (CM**3):
1.59090E+04 ONE KEY
3.81816E+05 24 TOTAL CORE

COMPONENT DENSITY (G/CM2):
7.85000E+00 MET HAND

CALCULATION NUMBERS: C06 V06

ELEMENT	WEIGHT FRACTION	NUMBER DENSITY
C	0.00280	1 .0200E+21
MN	0.01035	8.90700E+20
P	0.00035	5.34300E+19
S	0.00040	5.89900E+19
SI	0.00283	4.76400E+20
FE	0.98307	8.32300E+22
CO	0.00020	1.60500E+19

COMMENTS:

ACTIVATION ANALYSIS DATA

COMPONENT: TOP REFLECTOR CR
LOCATION: FIXED OR REMOVABLE:
DESC: METAL CLAD TOP REFLECTOR FOR A CONTROL ROD REGION
METAL SHELL ONLY - ONLY PRIMARY PLATES NOT INNER TUBES
REF DWGS; 90R1701-318,ISSUE E

COMPOSITION REF: SST347 (ASTM-A240)
COMPONENT VOLUME (CM**3):
3.00690E+03 ONE ELE - PRIM PLATE .
1.11255E+05 37 TOT CORE PRI PLAT .
9.64500E+03 TOTAL METAL .
2.04200E+03 GRANULE VOLUME .
COMPONENT DENSITY (G/CM2):
7.80000E+00 MET HAND .
.
CALCULATION NUMBERS: C03 V07

ELEMENT	WEIGHT FRACTION	NUMBER DENSITY
C	0.00080	3.12900E+20
MN	0.02000	1.71000E+21
P	0.00045	6.82500E+19
S	0.00030	4.39600E+19
SI	0.01000	1.67300E+21
CR	0.18000	1.62600E+22
NI	0.11000	8.80200E+21
NB	0.01000	5.05700E+20
FE	0.66645	5.60600E+22
CO	0.00200	1.59400E+20

COMMENTS: NUMBER DENSITIES FOR PRIMARY PLATES ONLY (TOP,MIDDLE,BOTTOM,SIDES)
NOT FOR INNER TUBES

ACTIVATION ANALYSIS DATA

COMPONENT: BORONATED RODS
LOCATION: FIXED OR REMOVABLE:
DESC: BORONATED RODS IN SIDE REFLECTOR BLOCKS

REF DWGS; 90R1701-850,ISSUE F
90R1701-830,ISSUE F
-829,ISSUE H
-819,ISSUE F
REFERENCE SPECIFICATION: 17-R-12
COMPOSITION REF: AISI-304
COMPONENT VOLUME (CM**3):
1.81900E+03 ONE ROD
5.63512E+06 309792 TOTAL CORE

COMPONENT DENSITY (G/CM2):
7.90000E+00 MET HAND

CALCULATION NUMBERS: C02 V01

ELEMENT	WEIGHT FRACTION	NUMBER DENSITY
C	0.00080	3.16900E+20
MN	0.02000	1.73200E+21
SI	0.01000	1.69400E+21
CR	0.19000	1.73900E+22
NI	0.09250	7.49700E+21
P	0.00045	6.91300E+19
S	0.00030	4.45200E+19
N	0.00100	3.39[illegible]00E+20
B	0.02250	9.90400E+21
FE	0.66045	5.62700E+22
CO	0.00200	1.61500E+20

COMMENTS:

ACTIVATION ANALYSIS DATA

COMPONENT: LARGE SIDE REFLECTOR METAL JACKET
LOCATION: FIXED OR REMOVABLE:
DESC: METAL JACKET FOR KEYED LARGE SIDE REFLECTOR (TYPE 1 - TYPICAL)

REF DWGS; R1701-701
-711
-710

COMPOSITION REF: SA387 GRC (GRC=GR11 PER TELECON W/ E DUPONT, QA)
COMPONENT VOLUME (CM**3):
1.61780E+03 ONE ELEMENT
3.88272E+05 24 TOTAL CORE

COMPONENT DENSITY (G/CM2):
7.86000E+00 MET HAND

CALCULATION NUMBERS: V10 C07

ELEMENT	WEIGHT FRACTION	NUMBER DENSITY
C	0.00170	6.70000E+20
MN	0.00525	4.52400E+20
P	0.00035	5.34900E+19
S	0.00040	5.90650E+19
SI	0.00650	1.09600E+21
CR	0.01250	1.13800E+21
MO	0.00550	2.71400E+20
FE	0.96760	8.20200E+22
CO	0.00020	1.60700E+19

COMMENTS:

ACTIVATION ANALYSIS DATA

COMPONENT: PCRV LINER
LOCATION: FIXED OR REMOVABLE:
DESC: PCRV LINER AND COOLING TUBES HOMOGENOUS MIX

REF DWGS; SYSTEM DESCRIPTION SD-11-2 PAGE 5 OF 7
R1102-300 REV F
R1102-200 REV M
R1102-100 REV D

COMPOSITION REF: A537 GRB (LINER) , A537 (TUBES)
COMPONENT VOLUME (CM**3):
1.60000E+66 TOP HEAD
7.00000E+06 SIDEWALL
1.39000E+06 CSF (TOP)
9.65000E+05 CSF (SIDES)
COMPONENT DENSITY (G/CM2):
7.86000E+00 TYP FOR CARBON STEEL

CALCULATION NUMBERS: VC1 VC- 10

ELEMENT	WEIGHT FRACTION	NUMBER DENSITY
C	0.00240	9.45900E+20
MN	0.01310	1.12900E+21
P	0.00035	5.34900E+19
S	0.00040	5.90700E+19
SI	0.00333	5.61300E+20
CU	0.00365	2.71900E+20
NI	0.00265	2.13700E+20
CR	0.00270	2.45800E+20
MO	0.00085	4.19400E+19
FE	0.97037	8.22600E+22
CO	0.00020	1.60700E+19

COMMENTS: THE COMP OF THE LINER & COOLING TUBES ARE CLOSE (TUBES - SA106 GRB)
SO THE MIXTURE WAS ASSUMED TO BE ALL A537

ACTIVATION ANALYSIS DATA

COMPONENT: CORE BARREL TOP
LOCATION: FIXED OR REMOVABLE:
DESC: TOP PORTION OF CORE BARREL (TOP 12' - 2.25")

REF DWGS; R1105-505 REV D
R1100-500 REV K

COMPOSITION REF: ASMESA201 GRB (ASTM 515/516)
COMPONENT VOLUME (CM**3):
5.50050E+06 TOP

COMPONENT DENSITY (G/CM2):
7.85000E+00 MET HAND

CALCULATION NUMBERS: C08 V04

ELEMENT	WEIGHT FRACTION	NUMBER DENSITY
C	0.00300	1.18100E+21
MN	0.01035	8.90700E+20
P	0.00035	5.34300E+19
S	0.00040	5.89900E+19
SI	0.00263	4.76400E+29
FE	0.98305	8.32300E+22
CO	0.00020	1.60500E+19

COMMENTS:

ACTIVATION ANALYSIS DATA

COMPONENT: CORE BARREL BOTTOM/MIDDLE
LOCATION: FIXED OR REMOVABLE:
DESC: BOTTOM OF CORE BARREL
MIDDLE 8'- 2.50", BOTTOM 9' - 2.75"
REF DWGS; R1105-505 REVD

COMPOSITION REF: ASMESA387 GB
COMPONENT VOLUME (CM**3):
4.08350E+06 MIDDLE
5.05720E+06 BOTTOM

COMPONENT DENSITY (G/CM2):
7.86000E+00 MET HAND

CALCULATION NUMBERS: C08 V04

ELEMENT	WEIGHT FRACTION	NUMBER DENSITY
C	0.00170	6.70000E+20
MN	0.00525	4.52400E+20
P	0.00035	5.34900E+19
S	0.00040	5.90700E+19
SI	0.00225	3.79300E+20
CR	0.00975	8.87700E+20
MO	0.00525	2.59100E+20
FE	0.97485	8.26400E+22
CO	0.00020	1.60700E+19

COMMENTS:

ACTIVATION ANALYSIS DATA

COMPONENT: RCD-PRIMARY
LOCATION: FIXED OR REMOVABLE:
DESC: REGION CONSTRAINT DEVICE ON TOP OF TOP REFLECTORS
PRIMARY STRUCTURE ONLY - PINS ON A SEPARATE OBSERVATION
REF DWGS; 90R1701-074 ISSUE C
-073 ISSUE D
-072 ISSUE B
-071 ISSUE B
-070 ISSUE A
COMPOSITION REF: SA515 GR70
COMPONENT VOLUME (CM**3):
1.00210E+04 ONE DEVICE
8.41738E+05 84 TOTAL CORE

COMPONENT DENSITY (G/CM2):
7.85000E+00 MET HAND

CALCULATION NUMBERS: C01 V11

ELEMENT	WEIGHT FRACTION	NUMBER DENSITY
C	0.00350	1.37800E+21
MN	0.01250	1.07600E+21
P	0.00035	5.34300E+19
S	0.00040	5.89900E+19
SI	0.00280	4.71400E+20
FE	0.98025	8.29900E+22
CO	0.00020	1.60500E+19

COMMENTS:

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                         ACTIVATION ANALYSIS DATA

COMPONENT:  TOP REFLECTOR NCR
LOCATION:                  FIXED OR REMOVABLE:
DESC: TOP METAL CLAD REFLECTOR FOR A NON CONTROL ROD REGION, ALSO SAME
      COMP FOR METAL CLAD SIDE REFLECTOR AND REFLECTOR KEYS
REF DWGS; 90R1701-310 ISSUE J          90R1701-340   ISS ?
          90R1701-320       ?                 -347       F
          90R1701-327       E                 -324       D
          90R1701-150       H

COMPOSITION REF:   ASTMA387 GRD (GRD=GR22 PER TELECON W/ E DUPONT, QA)
COMPONENT VOLUME (CM**3):
                   6.70500E+03 ONE ELE,COOL, PRI PT   6.66100E+03 ONE ELE,SIDE, PRI PT
                   1.40805E+06 210 TOT CORE, ", "     4.39626E+05 COR TOT, SIDE, PP
                   8.65200E+03 TOT MET, 1 ELE, COOL     .
                   5.51000E+03 TOTAL B GRANULES         .
COMPONENT DENSITY (G/CM2):
                   7.86000E+00 MET HAND                 .
                                                        .
CALCULATION NUMBERS:   C04  V08  V09

          ELEMENT      WEIGHT FRACTION        NUMBER DENSITY
             C             0.00150              5.91200E+20
             MN            0.00450              3.87800E+20
             P             0.00035              5.34900E+19
             S             0.00035              5.16800E+19
             SI            0.00500              8.42800E+20
             CR            0.02250              2.04900E+21
             MO            0.01000              4.93400E+20
             FE            0.95560              8.10000E+22
             CO            0.00020              1.60700E+19
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COMMENTS:
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ACTIVATION ANALYSIS DATA

COMPONENT: RCD PINS
LOCATION: FIXED OR REMOVABLE:
DESC: REGION CONSTRAINT DEVICE PINS

REF DWGS; 90R1701-072 ISSUE B

COMPOSITION REF: ASME-SA637 GRADE 718 (UNS 0778)
COMPONENT VOLUME (CM**3):
6.21000E+02 ONE PIN
1.26300E+03 PER RCD
1.06087E+05 84 TOTAL CORE

COMPONENT DENSITY (G/CM2):
8.19000E+02 TELE W/ INCO

CALCULATION NUMBERS: VC2

ELEMENT	WEIGHT FRACTION	NUMBER DENSITY
C	0.00080	3.28600E+20
MN	0.00350	3.14300E+20
SI	0.00350	6.14700E+20
P	0.00015	2.38900E+19
S	0.00015	2.30800E+19
CR	0.19000	1.80300E+22
CO	0.01000	8.37000E+20
NB	0.05130	2.72400E+21
TI	0.00900	9.27200E+20
B	0.00006	2.73800E+19
CU	0.00300	2.32900E+20
NI	0.51500	4.32900E+22
FE	0.21360	1.88700E+22

COMMENTS: DENSITY REF - TELECON W/ MR. BREITZIG, INCO.

ACTIVATION ANALYSIS DATA

COMPONENT: INSULATION AND COVER PLATES / CSF
LOCATION: FIXED OR REMOVABLE:
DESC: HOMOGENOUS MIXTURE OF COVER PLATES AND KAOWOOL ON THE TOP OF THE CSF - THIS DOES NOT INCLUDE THE SILICA FOAM BRICKS
REF DWGS; 90-R1104-900

COMPOSITION REF: AISI1020 (CVPL),INCONEL 600 (FAST), GAMD-9074 (KAO)
COMPONENT VOLUME (CM**3):
3.23900E+06 COMPOSITE MIXTURE

COMPONENT DENSITY (G/CM2):
7.48000E-01

CALCULATION NUMBERS: VC8

ELEMENT	WEIGHT FRACTION	NUMBER DENSITY
O	.	3.25300E+21
AL	.	9.19500E+20
SI	.	8.9870uE+20
FE	.	8.49900E+21
TI	.	2.21100E+19
CA	.	1.85300E+18
NA	.	6.70800E+18
B	.	2.38900E+18
C	.	8.01700E+19
MN	.	4.01700E+19
P	.	6.15900E+18
S	.	7.46400E+18
CO	.	2.64400E+18
NI	.	7.55700E+19
CR	.	1.80300E+19
CU	.	4.76100E+17

COMMENTS:

ACTIVATION ANALYSIS DATA

COMPONENT: INSULATION AND COVER PLATE - PCRV TOP HEAD
LOCATION: FIXED OR REMOVABLE:
DESC: HOMOGENOUS MIXTURE OF COVER PLATES, INSULATION AND FASTENERS FOR THE PCRV TOP HEAD
REF DWGS; 90-1104-104
90-1104-250

COMPOSITION REF: KAOWOOL (GAMD-9074),AISI1020 (CVPL), NITRIDED C STEEL (FAST)
COMPONENT VOLUME (CM**3):
8.33500E+06 TOTAL FOR COMP

COMPONENT DENSITY (G/CM2):
1.16000E+00 CALCUALTED

CALCULATION NUMBERS: VC4

ELEMENT	WEIGHT FRACTION	NUMBER DENSITY
AL	.	8.94300E+20
SI	.	8.73100E+20
FE	.	1.06700E+22
TI	.	2.15100E+19
CA	.	1.80300E+18
NA	.	6.52400E+18
B	.	2.32300E+18
O	.	3.16400E+21
C	.	9.98400E+19
MN	.	4.91200E+19
P	.	7.74300E+18
S	.	9.34900E+18
CO	.	2.03400E+18

COMMENTS:

ACTIVATION ANALYSIS DATA

COMPONENT: INSULATION AND COVER PLATE - PCRV SIDES
LOCATION: FIXED OR REMOVABLE:
DESC: COMPOSITE KAOWOOL, COVER PLATE AND FASTENERS FOR THE PCRV SIDES

REF DWGS; 90-R1104-101
90-R1104-230

COMPOSITION REF: AISI1020(CVPL),KAOWOOL(GAMD-9074),NITRIDED C STEEL (FAST)
COMPONENT VOLUME (CM**3):
3.00500E+07 TOTAL COMP .
. .
. .
. .
COMPONENT DENSITY (G/CM2):
1.33000E+00 CALCULATED .
. .
CALCULATION NUMBERS: VC3

ELEMENT	WEIGHT FRACTION	NUMBER DENSITY
AL	.	8.72200E+20
SI	.	8.51400E+20
FE	.	1.24800E+22
TI	.	2.09700E+19
CA	.	1.75800E+18
NA	.	6.36300E+18
B	.	2.26600E+18
O	.	3.06800E+21
C	.	1.16800E+20
MN	.	5.74600E+18
P	.	9.05800E+18
S	.	1.09400E+19
CO	.	2.38000E+18
	.	.
	.	.
	.	.
	.	.

COMMENTS:

ACTIVATION ANALYSIS DATA

COMPONENT: CORE SUPPORT FLOOR POST SEATS
LOCATION: FIXED OR REMOVABLE: F
DESC: POST SEATS FOR GRAPHITE CORE SUPPORTS POSTS SETTING ON TOP OF CSF

REF DWGS; R1100-700
R1104-1596

COMPOSITION REF: INCONEL 600 (SMALL AMOUNT OF CARBON STEEL AT BASE NEGLECTED)
COMPONENT VOLUME (CM**3):
0.60000E+04 TOTAL FOR ALL 183 SL

COMPONENT DENSITY (G/CM2):
0.47000E+00

CALCULATION NUMBERS: VC5

ELEMENT	WEIGHT FRACTION	NUMBER DENSITY
NI	0.75000	6.52000E+22
CR	0.15500	1.52000E+22
FE	0.08000	7.31000E+21
C	0.00150	6.37000E+20
MN	0.00100	9.29000E+19
S	0.00015	2.39000E+19
SI	0.00500	9.08000E+20
CU	0.00500	4.01000E+20
CO	0.00200	1.73000E+20

COMMENTS:

ACTIVATION ANALYSIS DATA

COMPONENT: PCRV CONCRETE AND REBAR (OBS 1 OF 6)
LOCATION: FIXED OR REMOVABLE: F
DESC: HOMOGENOUS MIXTURE OF CONCRETE AND REBAR

REF DWGS; N1102-100 REV D
FSAR SECTION 5.5.2.2

COMPOSITION REF: A431,A432,A305 (REBAR); NUREG/CR-3473 PG 53 (CONCRETE)
COMPONENT VOLUME (CM**3):

1.44000E+07	TYP TOP LAYER	5.37000E+07	4TH 6" SIDE LAYER
4.90000E+07	1ST 6" SIDE LAYER	5.53000E+07	5TH 6" SIDE LAYER
5.06000E+07	2ND 6" SIDE LAYER	5.68000E+07	6TH 6" SIDE LAYER
5.22000E+07	3RD 6" SIDE LAYER	5.84000E+07	7TH 6" SIDE LAYER

COMPONENT DENSITY (G/CM2):
3.49200E+00 CALCULATED: (2%) [illegible].40000E+00 CONCRETE
(.2)(7.86)+(.8)(2.4) 7.86000E+00 REBAR

CALCULATION NUMBERS: VC6

ELEMENT	WEIGHT FRACTION	NUMBER DENSITY
H	.	1.59000E+22
[illegible]	.	4.30000E+22
NA	.	1.38000E+21
MN	.	5.13600E+20
AL	.	3.42900E+21
SI	.	1.05600E+22
K	.	2.58800E+20
CA	.	4.47200E+21
FE	.	3.09000E+21
S	.	5.98000E+19
P	.	3.15200E+20
CU	.	4.44000E+18
B	.	1.34000E+18
CO	.	1.21500E+18
N	.	6.99000E+18
CL	.	2.62000E+18
SC	.	3.79000E+17

COMMENTS: VOLUMES BROKE IN 6" LAYERS

ACTIVATION ANALYSIS DATA

COMPONENT: PCRV CONCRETE AND REBAR (OBS 2 OF 6)
LOCATION: FIXED OR REMOVABLE:
DESC:

REF DWGS;

COMPOSITION REF:
COMPONENT VOLUME (CM**3):
8.99000E+07 TOTAL CSF VOLUME .

COMPONENT DENSITY (G/CM2): .

CALCULATION NUMBERS:

ELEMENT	WEIGHT FRACTION	NUMBER DENSITY
TI	.	1.24000E+20
LI	.	1.17000E+18
V	.	6.00000E+18
CR	.	6.35000E+18
NI	.	5.71000E+17
ZN	.	4.37000E+18
GA	.	5.13000E+17
	.	.
AS	.	4.61000E+17
SE	.	5.36000E+16
BR	.	1.40000E+17
RB	.	2.04000E+18
SR	.	2.55000E+19
Y	.	1.06000E+18
ZR	.	4.14000E+18
	.	.
	.	.

COMMENTS:

6

ACTIVATION ANALYSIS DATA

COMPONENT: PCRV CONCRETE AND REBAR (OBS 3 OF 4)
LOCATION: FIXED OR REMOVABLE:
DESC:

REF DWGS;

COMPOSITION REF:
COMPONENT VOLUME (CM**3):
. .
. .
. .
. .

COMPONENT DENSITY (G/CM2):
. .
. .

CALCULATION NUMBERS:

E[illegible]MENT	WEIGHT FR[illegible]TION	NUMBER DENSITY
[illegible]	.	2.51000E+17
[illegible]	.	6.00000E+17
PB	.	1.75000E+17
AG	.	1.17000E+16
CD	.	1.75000E+16
SN	.	4.08000E+17
SB	.	1.05000E+17
CS	.	7.58000E+16
BA	.	5.54000E+19
C	.	3.16000E+19
LA	.	7.58000E+17
CE	.	1.42000E+18
SM	.	1.[illegible]000E+17
EU	.	3.21000E+16
	.	.
	.	.
	.	.

COMMENTS:

ACTIVATION ANALYSIS DATA

COMPONENT: PCRV CONCRETE AND REBAR (OBS 4 OF 4)
LOCATION: FIXED OR REMOVABLE:
DESC:

REF DWGS;

COMPOSITION REF:
COMPONENT VOLUME (CM**3): .

COMPONENT DENSITY (G/CM2): .

CALCULATION NUMBERS:

ELEMENT	WEIGHT FRACTION	NUMBER DENSITY
LU	.	1.57000E+16
HF	.	1.20000E+17
TA	.	2.57000E+16
W	.	8.16000E+16
PB	.	3.56000E+18
TH	.	2.04000E+17
U	.	1.57000E+17
O	.	3.10000E+22
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COMMENTS:

ACTIVATION ANALYSIS DATA

COMPONENT: STEAM GENERATOR
LOCATION: FIXED OR REMOVABLE: R?
DESC: INCLUDES SUPERHEATER II, REHEATER AND THEIR CENTRAL SUPPORT STRUCTURE

REF DWGS; 22-B-001-0076
-0077
-0078
-0087
-0102
COMPOSITION REF: INCOLOY 800 (ASSUMED FOR ALL INCLUDED PARTS)
COMPONENT VOLUME (CM**3):
1.40000E+07 TOT FOR TUBES & SUP

COMPONENT DENSITY (G/CM2):
7.94000E+00 PER TELE W/QA

CALCULATION NUMBERS: VC7

ELEMENT	WEIGHT FRACTION	NUMBER DENSITY
NI	0.32500	2.65000E+22
CR	0.21000	1.93000E+22
FE	0.43700	3.74000E+22
C	0.00100	3.98000E+20
MN	0.00015	1.31000E+19
SI	0.01000	1.70000E+21
CU	0.00750	5.64000E+20
AL	0.00380	6.74000E+20
TI	0.00380	3.80000E+20
CO	0.00200	1.62000E+20

COMMENTS:

ACTIVATION ANALYSES DATA

COMPONENT: CORE BARREL KEYS
LOCATION: FIXED OR REMOVABLE:
DESC: KEYS THE CORE BARREL AND LINER TOGETHER

REF DWGS; R1100-500
R1100-504
R1100-506

COMPOSITION REF: ASTM A387 GRB (COMP PER TELE W/ E DUPONT QA)
COMPONENT VOLUME (CM**3):
1.90000E+06 24 TOTAL KEYS

COMPONENT DENSITY (G/CM2):
7.85000E+00

CALCULATION NUMBERS: VC9

ELEMENT	WEIGHT FRACTION	NUMBER DENSITY
C	0.00170	6.69200E+20
MN	0.00530	4.56100E+20
P	0.00035	5.34200E+19
S	0.00040	5.89800E+19
SI	0.00230	3.87200E+20
CR	0.00980	8.90900E+20
MO	0.00530	2.61200E+20
CO	0.00020	1.60400E+19
FE	0.97470	8.25100E+22

COMMENTS:

ACTIVATION ANALYSIS DATA

COMPONENT: ORIFICE VALVE
LOCATION: FIXED OR REMOVABLE:
DESC: ORIFICE VALVE AND LOWER GUIDE TUBE

REF DWGS; D1201-500

COMPOSITION REF: ASTM A53 TYPE S GR B (ASSUMED AS TYPICAL FOR ALL)
COMPONENT VOLUME (CM**3):
1.59200E+06 37 TOTAL CORE

COMPONENT DENSITY (G/CM2):
7.85000E+00 ASTM

CALCULATION NUMBERS: VC- 11

ELEMENT	WEIGHT FRACTION	NUMBER DENSITY
C	0.00300	1.18100E+21
MN	0.01200	1.03300E+21
P	0.00050	7.63200E+19
S	0.00060	8.84700E+19
CO	0.00020	1.60400E+19
FE	0.98370	8.32800E+22

COMMENTS:

ACTIVATION ANALYSIS DATA

COMPONENT: SILICA BLOCKS - CSF
LOCATION: FIXED OR REMOVABLE:
DESC: THREE 3" LAYERS OF SILICA BLOCKS , TWO DIFFERENT DENSITIES - ONE
COMPOSITE DENSITY ASSUMED
REF DWGS; 90-R1104-900

COMPOSITION REF: MASSROCK & GLASSROCK FOAM (FSAR)
COMPONENT VOLUME (CM**3):
9.51700E+06 COMPOSITE MIXTURE .

COMPONENT DENSITY (G/CM2):
1.17700E+00 COMPOSITE MIXTURE .

CALCULATION NUMBERS: VC- 12

ELEMENT	WEIGHT FRACTION	NUMBER DENSITY
O	.	2.35800E+22
SI	.	1.17600E+22
FE	.	1.02500E+19
TI	.	1.33900E+19
CA	.	1.12200E+18
NA	.	4.06100E+18
B	.	1.44600E+18

COMMENTS:

ACTIVATION ANALYSI ,TA

COMPONENT: LARGE SIDE REFLECTOR - HLM GRAPI
LOCATION: FIXED OR REMOVABLE: F
DESC: HLM GRAPHITE IS USED IN THE LARGE PERMANEN, SIDE REFLECTORS

REF DWGS; GRAPHITE DATA AND IMPURITY DATA COME FROM GA

COMPOSITION REF: GRAPHITE DESIGN MANUAL,GA DOC 906374,ISS A,8/84,PROPRIETORY
COMPONENT VOLUME (CM**3):
4.68100E+07 PCRV TOTAL VOL . FROM FSAR TAB 3.3-1
1.95000E+06 AV PER BLK(24 TOTAL) .

COMPONENT DENSITY (G/CM2):
1.80000E+00 GRAPH DESIGN MAN .

CALCULATION NUMBERS:

ELEMENT	~~WEIGHT~~ FRACTION	ppm	NUMBER DENSITY	atoms/b·cm
B	~~5.00000~~	3	~~5.36170E+17~~	3.01E-7
FE	~~3650~~	2000	~~7.04600E+19~~	3.88E-5
V	~~76.00000~~	42	~~1.61740E+18~~	8.92E-7
TI	~~71.00000~~	39	~~1.60760E+18~~	8.83E-7
CA	~~354~~	195	~~9.57600E+18~~	5.14E-6
SI	~~118~~	65	~~4.55500E+18~~	2.31E-6
AL	~~82.00000~~	45	~~3.29680E+18~~	1.81E-6
BA	~~4[illegible].00000~~	25	~~3.55250E+17~~	1.97E-7
S	~~[illegible]9.00000~~	38	~~2.33290E+18~~	1.28E-6
LI	~~4.00000~~	2	~~6.24770E+17~~	3.12E-7
Co		.2		3.68E-9

COMMENTS:

ACTIVATION ANALYSIS DATA

COMPONENT:
LOCATION: FIXED OR REMOVABLE:
DESC:

REF DWGS;

COMPOSITION REF:
COMPONENT VOLUME (CM**3):

COMPONENT DENSITY (G/CM2):

CALCULATION NUMBERS:

ELEMENT	WEIGHT FRACTION	NUMBER DENSITY
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COMMENTS:

ACTIVATION ANALYSIS DATA

COMPONENT: CORE SUPPORT BLOCKS -PGX GRAPHITE
LOCATION: FIXED OR REMOVABLE: F
DESC: CORE SUPPORT BLOCKS ARE JUST ABOVE CORE SUPPORT POSTS

REF DWGS;

COMPOSITION REF: GRAPHITE DESIGN MANUAL GA DOC 906374 (PROPIETARY)
COMPONENT VOLUME (CM**3):

4.17780E+05	IRREGULAR BLOCK	.
4.69280E+05	HEXAGONAL BLOCK	.
.	24 IRREC BLCK	. 37 HEXAGONAL BLKS
2.73900E+07	TOTAL VOLUME CSB	.

COMPONENT DENSITY (G/CM2):

1.76000E+00	GRAPHITE DESIGN MAN	.
.		.

CALCULATION NUMBERS:

ELEMENT	~~WEIGHT FRACTION~~ ppm		NUMBER DENSITY — atoms/b cm	
B	4.00000	2	~~3.92210E+17~~	1.961E-7
FE	3606	1900	~~6.99650E+19~~	3.61E-5
V	27.00000	14	~~5.61850E+17~~	2.91E-7
TI	54.00000	28	~~1.19550E+18~~	6.20E-7
CA	368	190	~~9.73350E+18~~	5.03E-6
SI	120	62	~~4.52920E+18~~	2.34E-6
AL	128	66	~~5.02890E+18~~	2.59E-6
S	601	310	~~1.98680E+19~~	1.02E-5
LI	4.00000	2	~~6.10890E+17~~	3.05E-7
	.		.	
Co	.	.19	.	3.42E-9
	.		.	
	.		.	
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	.		.	

COMMENTS: WEIGHT FRACTIONS ARE IN PPM

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TTTTTTTTTTTT       11      3333333333    6666666666    8888888888    AAAAAAAAAA
TTTTTTTTTTTT      111     333333333333  666666666666  888888888888  AAAAAAAAAAAA
     TT          1111     33        33  66        66  88        88  AA        AA
     TT            11               33  66            88        88  AA        AA
     TT            11               33  66             88      88   AA        AA
     TT            11            3333   66666666666     88888888    AAAAAAAAAAAA
     TT            11            3333   666666666666    88888888    AAAAAAAAAAAA
     TT            11               33  66        66   88      88   AA        AA
     TT            11               33  66        66  88        88  AA        AA
     TT            11     33        33  66        66  88        88  AA        AA
     TT        1111111111 333333333333  666666666666  888888888888  AA        AA
     TT        1111111111  3333333333    6666666666    8888888888   AA        AA

   JJJJJJJJJJ 000000000000 BBBBBBBBBBB    00000000     00000000       11      2222222222    9999999999
   JJJJJJJJJJ 000000000000 BBBBBBBBBBBB  0000000000   0000000000     111     222222222222  999999999999
       JJ     00        00 BB        BB 00      0000 00      0000   1111     22        22  99        99
       JJ     00        00 BB        BB 00     00 00 00     00 00     11               22  99        99
       JJ     00        00 BB       BB  00    00  00 00    00  00     11               22  99        99
       JJ     00        00 BBBBBBBBBB   00   00   00 00   00   00     11              22   999999999999
       JJ     00        00 BBBBBBBBBB   00  00    00 00  00    00     11            22     999999999999
       JJ     00        00 BB       BB  00 00     00 00 00     00     11          22                 99
 JJ    JJ     00        00 BB        BB 0000      00 0000      00     11        22                   99
 JJ    JJ     00        00 BB        BB 000       00 000       00     11      22           99        99
 JJJJJJJJ     000000000000 BBBBBBBBBBBB  0000000000   0000000000  1111111111  222222222222  999999999999
  JJJJJJ      000000000000 BBBBBBBBBBB    00000000     00000000   1111111111  222222222222   9999999999

                                                                                             AAAAAAAAAA
                                                                                            AAAAAAAAAAAA
                                                                                            AA        AA
                                                                                            AA        AA
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                                                                                            AAAAAAAAAAAA
                                                                                            AAAAAAAAAAAA
                                                                                            AA        AA
                                                                                            AA        AA
                                                                                            AA        AA
                                                                                            AA        AA
                                                                                            AA        AA

*END  JOB00129 T1368A  1     001 001 LOCAL   1368 VW DIAMOND HILL ROOM    9.00.19 AM 11 JUL 89 PRT15   DDDD END  A*
*END  JOB00129 T1368A  1     001 001 LOCAL   1368 VW DIAMOND HILL ROOM    9.00.19 AM 11 JUL 89 PRT15   DDDD END  A*
*END  JOB00129 T1368A  1     001 001 LOCAL   1368 VW DIAMOND HILL ROOM    9.00.19 AM 11 JUL 89 PRT15   DDDD END  A*
*END  JOB00129 T1368A  1     001 001 LOCAL   1368 VW DIAMOND HILL ROOM    9.00.19 AM 11 JUL 89 PRT15   DDDD END  A*
*END  JOB00129 T1368A  1     001 001 LOCAL   1368 VW DIAMOND HILL ROOM    9.00.19 AM 11 JUL 89 PRT15   DDDD END  A*
*END  JOB00129 T1368A  1     001 001 LOCAL   1368 VW DIAMOND HILL ROOM    9.00.19 AM 11 JUL 89 PRT15   DDDD END  A*
*END  JOB00129 T1368A  1     001 001 LOCAL   1368 VW DIAMOND HILL ROOM    9.00.19 AM 11 JUL 89 PRT15   DDDD END  A*
*END  JOB00129 T1368A  1     001 001 LOCAL   1368 VW DIAMOND HILL ROOM    9.00.19 AM 11 JUL 89 PRT15   DDDD END  A*
*END  JOB00129 T1368A  1     001 001 LOCAL   1368 VW DIAMOND HILL ROOM    9.00.19 AM 11 JUL 89 PRT15   DDDD END  A*
*END  JOB00129 T1368A  1     001 001 LOCAL   1368 VW DIAMOND HILL ROOM    9.00.19 AM 11 JUL 89 PRT15   DDDD END  A*
*END  JOB00129 T1368A  1     001 001 LOCAL   1368 VW DIAMOND HILL ROOM    9.00.19 AM 11 JUL 89 PRT15   DDDD END  A*
*END  JOB00129 T1368A  1     001 001 LOCAL   1368 VW DIAMOND HILL ROOM    9.00.19 AM 11 JUL 89 PRT15   DDDD END  A*
*END  JOB00129 T1368A  1     001 001 LOCAL   1368 VW DIAMOND HILL ROOM    9.00.19 AM 11 JUL 89 PRT15   DDDD END  A*
*END  JOB00129 T1368A  1     001 001 LOCAL   1368 VW DIAMOND HILL ROOM    9.00.19 AM 11 JUL 89 PRT15   DDDD END  A*
*END  JOB00129 T1368A  1     001 001 LOCAL   1368 VW DIAMOND HILL ROOM    9.00.19 AM 11 JUL 89 PRT15   DDDD END  A*
*END  JOB00129 T1368A  1     001 001 LOCAL   1368 VW DIAMOND HILL ROOM    9.00.19 AM 11 JUL 89 PRT15   DDDD END  A*
```

FORM (A)292-12

Appendix C
EE-DEC-0010

Detailed Component Curie Inventory

T8184A

JOB00097

A

```
ART JOB00097 T8184A   1        001 001 LOCAL    D.HILL-8184-SHERMAN  ROOM      8.32.11 AM 11 OCT 90 PRT12    AAAA START A*
ART JOB00097 T8184A   1        001 001 LOCAL    D.HILL-8184-SHERMAN  ROOM      8.32.11 AM 11 OCT 90 PRT12    AAAA START A*
ART JOB00097 T8184A   1        001 001 LOCAL    D.HILL-8184-SHERMAN  ROOM      8.32.11 AM 11 OCT 90 PRT12    AAAA START A*
ART JOB00097 T8184A   1        001 001 LOCAL    D.HILL-8184-SHERMAN  ROOM      8.32.11 AM 11 OCT 90 PRT12    AAAA START A*
ART JOB00097 T8184A   1        001 001 LOCAL    D.HILL-8184-SHERMAN  ROOM      8.32.11 AM 11 OCT 90 PRT12    AAAA START A*
ART JOB00097 T8184A   1        001 001 LOCAL    D.HILL-8184-SHERMAN  ROOM      8.32.11 AM 11 OCT 90 PRT12    AAAA START A*
ART JOB00097 T8184A   1        001 001 LOCAL    D.HILL-8184-SHERMAN  ROOM      8.32.11 AM 11 OCT 90 PRT12    AAAA START A*
ART JOB00097 T8184A   1        001 001 LOCAL    D.HILL-8184-SHERMAN  ROOM      8.32.11 AM 11 OCT 90 PRT12    AAAA START A*
ART JOB00097 T8184A   1        001 001 LOCAL    D.HILL-8184-SHERMAN  ROOM      8.32.11 AM 11 OCT 90 PRT12    AAAA START A*
ART JOB00097 T8184A   1        001 001 LOCAL    D.HILL-8184-SHERMAN  ROOM      8.32.11 AM 11 OCT 90 PRT12    AAAA START A*
ART JOB00097 T8184A   1        001 001 LOCAL    D.HILL-8184-SHERMAN  ROOM      8.32.11 AM 11 OCT 90 PRT12    AAAA START A*
ART JOB00097 T8184A   1        001 001 LOCAL    D.HILL-8184-SHERMAN  ROOM      8.32.11 AM 11 OCT 90 PRT12    AAAA START A*
ART JOB00097 T8184A   1        001 001 LOCAL    D.HILL-8184-SHERMAN  ROOM      8.32.11 AM 11 OCT 90 PRT12    AAAA START A*
ART JOB00097 T8184A   1        001 001 LOCAL    D.HILL-8184-SHERMAN  ROOM      8.32.11 AM 11 OCT 90 PRT12    AAAA START A*
ART JOB00097 T8184A   1        001 001 LOCAL    D.HILL-8184-SHERMAN  ROOM      8.32.11 AM 11 OCT 90 PRT12    AAAA START A*
ART JOB00097 T8184A   1        001 001 LOCAL    D.HILL-8184-SHERMAN  ROOM      8.32.11 AM 11 OCT 90 PRT12    AAAA START A*
```

J E S 2 J O B L O G -- S Y S T E M A A A A -- N O D E L O O K O U T

```
-------- JOB00097  IEF097I T8184A   - USER T8184    ASSIGNED
08.29.32 JOB00097  TSS7011 T8184    LAST-USED 11 OCT 90 08:26 SYSTEM=AAAA FACILITY=BATCH
08.29.32 JOB00097  TSS7021 COUNT=09897  MODE=WARN  LOCKTIME=NONE NAME=SHERMAN, RUSSELL
08.29.32 JOB00097  $HASP373 T8184A   STARTED - INIT 16 - CLASS C - SYS AAAA
08.30.06 JOB00097  = T8184A   001            IEBGENER   ------------ R000
08.30.07 JOB00097  = T8184A     1     6885    32.48   ------------  EOJ =
08.30.07 JOB00097  $HASP395 T8184A   ENDED
```

------ JES2 JOB STATISTICS ------

11 OCT 90 JOB EXECUTION DATE

10 CARDS READ

5,109 SYSOUT PRINT RECORDS

0 SYSOUT PUNCH RECORDS

643 SYSOUT SPOOL KBYTES

9.62 MINUTES EXECUTION TIME

```
1 //T8184A JOB (12,4840-63-09-N703N450),'D.HILL-8184-SHERMAN',          JOB00097
  //         MSGCLASS=R,CLASS=C,NOTIFY=T818~,MSGLEVEL=(1,1)
2 //THOUP OUTPUT CHARS=GT18,PAGEDEF=MP120,PRMODE=PAGE,DEFAULT=YES,
  //            JESDS=ALL
  ***JOBPARM LINES=100
3 //        EXEC PGM=IEBGENER
4 //SYSPRINT     DD   SYSOUT=c
5 //SYSIN  DD     DUMMY
6 //SYSUT2 DD SYSOUT=*,DCB=(RECFM=FBA,LRECL=133,BLKSIZE=6118),COPIES=02
7 //SYSUT1 DD  DSN=T8184.REBATE.L133R5(RSSITEA),DISP=SHR
```

```
TSS7011 T8184    LAST-USED 11 OCT 90 08:26 SYSTEM=AAAA FACILITY=BATCH
TSS7021 COUNT=09897  MODE=WARN  LOCKTIME=NONE NAME=SHERMAN, RUSSELL
IEF236I ALLOC. FOR T8184A
IEF237I JES2 ALLOCATED TO SYS[illegible] INT
IEF237I DMY  ALLOCATED TO SYSIN
IEF237I JES2 ALLOCATED TO SYSUT2
IEF237I 65C  ALLOCATED TO SYSUT1
IEF142I T8184A - STEP WAS EXECUTED - COND CODE 0000
IEF285I   JES2.JOB00097.D0000101                          SYSOUT
IEF285I   JES2.JOB00097.D0000102                          SYSOUT
IEF285I   T8184.REBATE.L133R5                             KEPT
IEF285I   VOL SER NOS= TS0303.
****************************************** S T E P   T E R M I N A T I O N ******************************************
*    JOB    STP   STEP       PGM       STARTED       ENDED        TCB       SRB     ELAPSED    SWAP  CORE     COMP *
*    NAME    #    NAME       NAME       TIME          TIME      SECONDS   SECONDS   SECONDS   COUNT  USED     CODE *
* T8184A   001           IEBGENER 08:29:33.22 08:30:06.99         .17       .06     33.77        0  344K     R000 *
*********************************************************************************************************************
*                        SWAP     SWAP       VIO       VIO        TCB       I/O       MSO       SRB       TOTAL     *
*  PAGEINS PAGEOUTS  PAGEINS PAGEOUTS  PAGEINS PAGEOUTS         S U       S U       S U       S U        S U      *
*        7        7        0        0        0        0        1654      1670      1070       491       4885      *
*********************************************************************************************************************
IEF373I STEP /        / START 90284.0829
IEF374I STEP /        / STOP  90284.0830 CPU    0MIN 00.17SEC SRB    0MIN 00.06SEC VIRT   128K SYS   216K EXT       4K SYS    9064K
****************************************** J O B   T E R M I N A T I O N *******************************************
*    JOB   PERF   TOTAL    ACTIVE    STARTED       ENDED         TCB       SRB    ELAPSED    TOTAL                    *
*    NAME   GRP    S U    SECONDS     TIME          TIME       SECONDS   SECONDS  SECONDS    SWAPS                    *
* T8184A     1    4885     32.48 08:29:33.22 08:30:07.61          .17       .06    34.59        0                    *
*********************************************************************************************************************
IEF375I  JOB /T8184A  / START 90284.0829
IEF376I  JOB /T8184A  / STOP  90284.0830 CPU    0MIN 00.17SEC SRB    0MIN 00.06SEC
```

PROCESSING ENDED AT EOD

COMPONENT : BORONATED STAINLESS STEEL RODS R5
VOLUME : 2.50250E+07 CC
: ABOVE VOLUME IS FOR ALL SS RODS IN THE SPACER BLOCKS BTWN THE
: CORE BARREL AND THE PERMANENT LARGE SIDE REFLECTORS
: TOTAL OF 309792 RODS AT 80.78 CC OF HOMOGENIZED TARGET MATL/ROD
: (INTERVALS 46-51 TOTGRDRS)

NUCLIDE SYM	Z	N	HALF-LIFE (SECONDS)	CONCENTRATION (CURIES/CC) AT TIME SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
LI	3	8	8.40170E-01	1.09090E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	8	3.00064E-16	2.62130E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	10	7.00563E+13	1.76762E-13	1.76762E-13	1.76761E-13	1.76761E-13	1.76761E-13	1.76760E-13	1.76759E-13	1.76757E-13
B	5	12	1.99756E-02	6.24720E-06	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
C	6	14	1.80970E+11	4.07729E-08	4.07581E-08	4.07483E-08	4.07237E-08	4.06745E-08	4.06254E-08	4.04783E-08	4.02831E-08
AL	13	28	1.38629E+02	1.33196E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SI	14	31	9.43057E+03	7.65964E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	9.17407E-10	7.80059E-33	3.30539E-48	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	3.48315E+02	5.60655E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	49	2.85246E+07	5.55462E-12	5.56595E-13	1.20078E-13	2.59500E-15	1.21307E-18	5.66095E-22	5.70553E-32	2.75933E-45
V	23	52	2.02084E+02	5.08100E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	53	1.19922E+02	1.06055E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	54	5.50117E+01	1.05395E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39043E+06	1.88761E-03	2.47417E-15	2.96326E-23	4.65209E-43	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	1.31281E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	5.04488E-17	5.04488E-17	5.04488E-17	5.04488E-17	5.04487E-17	5.04486E-17	5.04483E-17	5.04479E-17
MN	25	54	2.61565E+07	9.32953E-08	7.59082E-09	1.42531E-09	2.17751E-11	5.08233E-15	1.18619E-18	1.50017E-29	4.47552E-46
MN	25	56	9.29152E+03	3.64481E-03	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	1.24660E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	1.24340E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	2.61511E-03	1.17506E-03	6.89352E-04	1.81716E-04	1.26269E-05	8.77401E-07	2.94379E-10	6.06309E-15
FE	26	59	3.89409E+06	3.10209E-05	1.40940E-12	1.96765E-17	1.24812E-29	5.02151E-54	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	60	3.15569E+12	8.30075E-20	8.30058E-20	8.30046E-20	8.30017E-20	8.29960E-20	8.29903E-20	8.29730E-20	8.29500E-20
FE	26	61	3.60001E+02	1.03108E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	57	2.34038E+07	3.27609E-10	2.00346E-11	3.10970E-12	2.95193E-14	2.65982E-18	2.39661E-22	1.75322E-34	1.15564E-50
CO	27	58	6.13405E+06	1.96095E-07	4.42960E-12	3.53982E-15	6.38994E-23	2.08216E-38	6.70472E-54	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	4.12090E-04	2.78062E-04	2.13637E-04	1.10538E-04	2.95921E-05	7.92215E-06	1.52000E-07	7.80748E-10
CO	27	61	5.94007E+03	1.56272E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	62	8.34012E+02	3.23500E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	64	2.99999E-01	2.02146E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NI	28	59	2.52053E+12	1.12275E-07	1.12270E-07	1.12268E-07	1.12263E-07	1.12253E-07	1.12243E-07	1.12214E-07	1.12175E-07
NI	28	63	2.90020E+09	1.60411E-05	1.56822E-05	1.54476E-05	1.48757E-05	1.37950E-05	1.27920E-05	1.02023E-05	7.54531E-06
TOTAL (CURIES/CC)				8.61426E-03	1.46097E-03	9.18591E-04	3.87282E-04	5.61649E-05	2.17452E-05	1.05473E-05	7.69055E-06
TOTAL (CURIES)				2.15572E+05	3.67609E+04	2.29877E+04	7.68973E+03	1.40550E+03	5.44175E+02	2.62946E+02	1.92656E+02

COMPONENT : BORONATED GRAPHITE BLOCK MINUS ALL THE BORON RODS - REV 5
VOLUME : 3.39500E+07 CC
: ABOVE VOLUME IS FOR THE GRAPHITE MATERIAL ONLY
: COMPRISING EACH BORONATED GRAPHITE BLOCK.
:
: (INTERVAL 45 , TOTGRDRS)

NUCLIDE SYM	Z	N	HALF-LIFE (SECONDS)	CONCENTRATION (CURIES/CC) AT TIME SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
H	1	3	3.87233E+08	4.02380E-04	3.39662E-04	3.03377E-04	2.20729E-04	1.30016E-04	7.39046E-05	1.35737E-05	1.41709E-06
HE	2	6	8.09751E-01	3.94556E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
LI	3	8	8.40170E-01	1.06335E-06	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	8	3.00064E-16	8.41754E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	10	7.00563E+13	3.36033E-15	3.36033E-15	3.36033E-15	3.36032E-15	3.36031E-15	3.36031E-15	3.36020E-15	3.36024E-15
B	5	12	1.99756E-02	1.22026E-07	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NA	11	24	5.41521E+04	1.45871E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MG	12	27	5.60153E+02	4.93892E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AL	13	28	1.38629E+02	4.29310E-05	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	3.00526E-10	2.50153E-33	1.00270E-48	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AR	18	37	3.02604E+06	4.33909E-10	1.66703E-19	8.00805E-26	1.70005E-41	7.36639E-73	0.00000E+00	0.00000E+00	0.00000E+00
AR	18	39	8.40405E+09	2.09566E-15	2.07951E-15	2.06002E-15	2.04232E-15	1.99034E-15	1.93960E-15	1.79530E-15	1.61938E-15
CA	20	41	2.52053E+12	2.39043E-08	2.39037E-08	2.39032E-08	2.39022E-08	2.39001E-08	2.38981E-08	2.38918E-08	2.38835E-08
CA	20	45	1.42623E+07	9.15043E-06	9.19600E-08	6.27792E-09	2.60011E-12	4.36790E-19	9.53916E-26	9.93572E-46	2.25002E-72
CA	20	47	3.91608E+05	4.76309E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	46	7.25049E+06	4.59377E-12	3.36879E-16	1.29134E-18	3.63013E-25	2.06855E-38	2.26672E-51	0.00000E+00	0.00000E+00
SC	21	47	2.96217E+05	5.44900E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	48	1.58253E+05	1.17701E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	49	3.44649E+03	8.40435E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	50	1.03147E+02	1.40163E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	3.48315E+02	7.83964E-07	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	49	2.85246E+07	2.39672E-15	2.40161E-16	5.10114E-17	1.12004E-18	5.23417E-22	2.44663E-25	2.49636E-35	1.19060E-48
V	23	52	2.02084E+02	4.60000E-04	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39043E+06	2.97536E-11	3.09992E-23	4.67085E-31	7.33265E-51	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	1.69434E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	3.54952E-19	3.54952E-19	3.54952E-19	3.54951E-19	3.54950E-19	3.54950E-19	3.54948E-19	3.54945E-19
MN	25	54	2.61565E+07	7.27773E-10	5.92141E-11	1.11185E-11	1.69862E-13	3.96460E-17	9.25318E-21	1.17640E-31	3.49126E-46
MN	25	56	9.29152E+03	3.51930E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	9.30151E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	8.76205E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	1.16701E-03	5.24379E-04	3.07620E-04	8.10920E-05	5.63463E-06	3.91546E-07	1.31369E-10	3.06270E-15
FE	26	59	3.89409E+06	1.38054E-05	6.62072E-13	8.75675E-18	5.55456E-30	2.23475E-54	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	6.06280E-06	4.08299E-06	3.13690E-06	1.62310E-06	4.34523E-07	1.16327E-07	2.23193E-09	1.14643E-11
TOTAL (CURIES/CC)				2.10340E-03	8.68240E-04	6.14170E-04	3.11466E-04	1.36109E-04	7.44363E-05	1.35999E-05	1.44099E-06
TOTAL (CURIES)				7.14103E+04	2.94767E+04	2.08511E+04	1.05743E+04	4.62009E+03	2.52711E+03	4.61717E+02	4.89215E+01

COMPONENT : CORE BARREL - MIDDLE AND BOTTOM R5
VOLUME : 9.14100E+06 CC
: ABOVE VOLUME IS FOR THE LOWER 17 FEET OF THE CORE BARREL
: BOTTOM 9 FT - 2.75" THICK
: MIDDLE 8 FT - 2.50" THICK
: (INTERVALS 52-54 TOTGRDRS)

NUCLIDE SYM	Z	M	HALF-LIFE (SECONDS)	CONCENTRATION (CURIES/CC) AT TIME SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
AL	13	28	1.38629E+02	2.35536E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SI	14	31	9.43057E+03	4.20397E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	8.84228E-10	7.59558E-33	3.18585E-48	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	3.48315E+02	2.43035E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	49	2.85246E+07	2.43490E-13	2.43987E-14	5.26368E-15	1.13789E-16	5.31755E-20	2.48502E-23	2.53613E-33	1.20957E-46
V	23	52	2.02084E+02	1.93010E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	53	1.19922E+02	4.26917E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	54	5.50117E+01	4.61747E-13	0.00000E+00	0.00000E+00	0.0000[illegible]+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39843E+06	6.77932E-08	8.88594E-20	1.06425E-27	1.67079[illegible]47	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	2.66285E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	6.36256E-17	6.36256E-17	6.36256E-17	6.36255E-17	6.36254E-17	6.36253E-17	6.36249E-17	6.36245E-17
MN	25	54	2.61565E+07	9.95309E-08	8.09818E-09	1.52057E-09	2.32305E-11	5.42202E-15	1.26547E-18	1.60897E-29	4.77466E-44
MN	25	56	9.29152E+03	1.49268E-06	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	1.40789E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	[illegible].55922E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	1.10275E-06	4.95507E-07	2.90690E-07	7.66271E-08	5.32457E-09	3.69987E-10	1.24135E-13	2.89407E-18
FE	26	59	3.89409E+06	8.646[illegible]E-08	4.15174E-15	5.48458E-20	3.47896E-32	1.39968E-56	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	1.04479E-07	7.03604E-08	5.40582E-08	2.79702E-08	7.48794E-09	2.00461E-09	3.84618E-11	1.97559E-13
ZR	40	88	7.20602E+06	2.81852E-14	3.12670E-18	7.21876E-21	1.84890E-27	1.21282E-40	7.95564E-54	0.00000E+00	0.00000E+00
ZR	40	89	2.82249E+05	2.81148E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	93	4.74758E+13	2.04540E-18	2.04540E-18	2.04540E-18	2.04540E-18	2.04539E-18	2.04538E-18	2.04535E-18	2.04531E-18
ZR	40	95	5.63534E+06	6.37336E-13	5.58619E-18	2.37475E-21	8.84849E-30	1.22845E-46	1.70547E-63	0.00000E+00	0.00000E+00
ZR	40	97	6.04840E+04	8.89187E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	91	2.20888E+10	9.14346E-16	9.11633E-16	9.09830E-16	9.05336E-16	8.96415E-16	8.87582E-16	8.61601E-16	8.28139E-16
NB	41	92	8.80746E+05	1.80101E-11	7.89462E-44	2.11448E-65	0.00000E+00	0.0000[illegible]00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	94	6.30134E+11	2.70762E-16	2.70734E-16	2.70715E-16	2.70668E-16	2.7057[illegible]16	2.70480E-16	2.70199E-16	2.69824E-16
NB	41	95	3.02[illegible]E+06	5.25959E-12	2.02031E-21	1.06756E-27	2.16697E-43	8.92746E-75	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	96	8.78132E+04	9.54788E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	97	6.33217E+03	9.25600E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	98	3.06025E+03	2.54320E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	100	3.09994E+00	1.64379E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	93	2.84077E+11	1.72741E-12	1.72701E-12	1.72675E-12	1.72608E-12	1.72475E-12	1.72343E-12	1.71945E-12	1.71416E-12
MO	42	9[illegible]	2.41515E+05	1.16269E-07	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	101	8.76292E+02	4.85388E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TOTAL (CURIES/CC)				3.12586E-06	5.73967E-07	3.46271E-07	1.04622E-07	1.28142E-08	2.37632E-09	[illegible]03865E-11	1.91289E-12
TOTAL (CURIES)				2.85734E+01	5.24663E+00	3.16526E+00	9.56351E-01	1.17135E-01	2.17219E-02	3.60442E-04	1.74857E-05

COMPONENT : CORE BARREL [illegible] 04
VOLUME : 5.50850E+06 [illegible]
: ABOVE VOLUME IS FOR THE TOP 12 FT OF THE CORE BARREL
: TOP 12FT - 2.25" THICK
:
: (INTERVALS 52-54 RCBTOPRS)

NUCLIDE SYM	Z	M	HALF-LIFE (SECONDS)	CONCENTRATION (CURIES/CC) AT TIME SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
AL	13	28	1.38629E+02	2.95834E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SI	14	31	9.43057E+03	4.19926E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	8.83031E-10	7.58530E-33	3.18154E-48	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	52	2.02084E+02	8.52220E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39843E+06	4.56189E-09	5.97947E-21	7.16148E-29	1.12429E-48	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	5.09573E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	6.40799E-17	6.40798E-17	6.40798E-17	6.40797E-17	6.40796E-17	6.40795E-17	6.40791E-17	6.40787E-17
MN	25	54	2.61565E+07	1.00241E-07	8.15599E-09	1.53143E-09	2.33963E-11	5.46073E-15	1.27451E-18	1.62046E-29	4.80874E-44
MN	25	56	9.29152E+03	2.88473E-06	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	1.61794E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	1.57036E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	1.11063E-06	4.99044E-07	2.92765E-07	7.71741E-08	5.36258E-09	3.72629E-10	1.25022E-13	2.91473E-18
FE	26	59	3.89409E+06	8.70840E-08	4.18137E-15	5.52372E-20	3.50379E-32	1.40967E-56	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	1.04349E-07	7.02730E-08	5.39911E-08	2.79355E-08	7.47864E-09	2.00212E-09	3.84148E-11	1.97314E-13
TOTAL (CURIES/CC)				4.29788E-06	5.77473E-07	3.48288E-07	1.05133E-07	1.28412E-08	2.37474E-09	3.85391E-11	1.97388E-13
TOTAL (CURIES)				2.36749E+01	3.18101E+00	[illegible].91854E+00	5.79125E-01	7.07359E-02	1.30813E-02	2.12292E-04	1.08727E-06

COMPONENT : METAL CLAD REFLECTOR - CONTROL ROD ELEMENT R5
VOLUME : 3.56860E+05 CC
: ABOVE VOLUME IS FOR THE TOTAL VOLUME OF METAL FOR ALL METAL
: CLAD CR REFLECTORS. TOTAL OF 37 ELEMENTS AT 9.645+3 CC EACH
:
: (INTERVALS 29-39 TOPREFRS)

NUCLIDE SYM	Z	M	HALF-LIFE (SECONDS)	CONCENTRATION (CURIES/CC) AT TIME SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
LI	3	8	8.40170E-01	1.71846E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	8	3.00064E-16	2.66747E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	10	7.80563E+13	3.82920E-13	3.82920E-13	3.82920E-13	3.82919E-13	3.82918E-13	3.82917E-13	3.82914E-13	3.82909E-13
B	5	12	1.99754E-02	1.37545E-05	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AL	13	28	1.34629E+02	2.51004E-07	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SI	14	31	9.43057E+03	1.59126E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	1.94043E-08	1.66604E-31	6.99131E-47	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	3.48315E+02	9.56952E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	49	2.85246E+07	9.64170E-11	9.46095E-12	2.04107E-12	4.41232E-16	2.06196E-17	9.63603E-21	9.83421E-31	4.69028E-44
V	23	52	2.02084E+02	9.60905E-07	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	53	1.99822E+02	1.89946E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	54	6.50117E+01	1.79186E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39863E+06	7.84694E-02	1.02853E-13	1.23185E-21	1.93391E-41	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	2.56329E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	9.13715E-16	9.13714E-16	9.13714E-16	9.13713E-16	9.13711E-16	9.13710E-16	9.13705E-16	9.13698E-16
MN	25	54	2.61565E+07	1.94099E-06	1.58658E-07	2.97900E-08	4.55127E-10	1.06227E-13	2.47930E-17	3.15227E-28	9.35443E-43
MN	25	56	9.29152E+03	1.59340E-01	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	2.42221E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	2.25693E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	1.15072E-01	5.17050E-02	3.03333E-02	7.99598E-03	5.55615E-04	3.86079E-05	1.29534E-08	3.01996E-13
FE	26	59	3.89409E+06	1.36826E-03	6.56976E-11	8.67086E-16	5.50515E-28	2.21487E-52	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	60	3.15569E+12	1.77230E-18	1.77226E-18	1.77223E-18	1.77217E-18	1.77205E-18	1.77193E-18	1.77156E-18	1.77107E-18
FE	26	61	3.60001E+02	2.20080E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	57	2.34838E+07	6.99372E-09	6.27693E-10	6.63868E-11	6.30170E-13	5.67811E-17	5.11621E-21	3.74274E-33	2.46703E-49
CO	27	58	6.13405E+06	4.93357E-06	1.11447E-10	8.90587E-14	1.60765E-21	5.23853E-37	1.70697E-52	0.00000E+00	0.00000E+00
CO	27	60	1.65903E+08	1.80705E-02	1.21694E-02	9.34983E-03	4.83769E-03	1.29510E-03	3.46716E-04	6.65229E-06	3.41695E-08
CO	27	61	5.94007E+03	3.66099E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	62	8.34012E+02	6.94066E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	64	[illegible]	6.02231E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NI	28	59	2.52053E+12	5.83180E-06	5.83166E-06	5.83154E-06	5.83129E-06	5.83078E-06	5.83028E-06	5.82876E-06	5.82674E-06
NI	28	63	2.90020E+09	8.32349E-04	8.13727E-04	8.01544E-04	7.71080E-04	7.15804E-04	6.63802E-04	5.29385E-04	3.91515E-04
Y	39	89	1.56998E+01	7.68123E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	90	2.30281E+05	4.75260E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	93	4.74750E+13	6.26056E-15	6.26055E-15	6.26055E-15	6.26053E-15	6.26050E-15	6.26047E-15	6.26039E-15	6.26027E-15
NB	41	92	8.80746E+05	2.11478E-09	9.26997E-42	2.48285E-63	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	94	6.30134E+11	4.94431E-07	4.94379E-07	4.94345E-07	4.94259E-07	4.94086E-07	4.93916E-07	4.93402E-07	4.92718E-07
TOTAL (CURIES/CC)				3.73180E-01	6.46953E-02	4.04910E-02	1.36119E-02	2.57285E-03	1.05545E-03	5.62372E-04	3.97069E-04
TOTAL (CURIES)				1.33173E+05	2.30872E+04	1.44496E+04	4.85753E+03	9.18146E+02	3.76647E+02	1.93551E+02	1.41983E+02

COMPONENT : CORE SUPPORT BLOCKS R5
VOLUME : 2.73980E+07 CC
: ABOVE VOLUME IS FOR THE TOTAL VOLUME OF THE CORE SUPPORT
: BLOCKS. 37 HEX BLOCKS AT 4.692+5 EACH AND 24 IRREGULAR
: BLOCKS AT 4.1778+5 CC EACH.
: (INTERVALS 39-66 TOTGRBRS)

NUCLIDE SYM	Z	M	HALF-LIFE (SECONDS)	CONCENTRATION (CURIES/CC) AT TIME SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
H	1	3	3.87233E+08	2.04091E-06	1.72277E-06	1.53073E-06	1.16011E-06	6.59460E-07	3.74846E-07	6.88457E-08	7.18750E-09
HE	2	6	8.09751E-01	1.12233E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
LI	3	8	8.40170E-01	5.39360E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	8	3.00064E-16	1.58966E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	10	7.88563E+13	1.17260E-17	1.17260E-17	1.17260E-17	1.17260E-17	1.17259E-17	1.17259E-17	1.17258E-17	1.17257E-17
B	5	12	1.99754E-02	4.15028E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NA	11	24	5.41521E[illegible]	6.18296E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MG	12	27	5.68155E+02	2.07060E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AL	13	28	1.34629E+02	3.18065E-07	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	6.98124E-10	5.99496E-33	2.51533E-48	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AR	18	37	3.02604E+06	1.24261E-10	4.77311E-20	2.52218E-26	5.11961E-42	2.10917E-73	0.00000E+00	0.00000E+00	0.00000E+00
AR	18	39	8.48405E+09	6.04041E-16	5.99086E-16	5.96324E-16	5.88600E-16	5.73702E-16	5.59099E-16	5.17484E-16	4.66776E-16
CA	20	41	2.52053E+12	1.21026E-10	1.21023E-10	1.21021E-10	1.21016E-10	1.21005E-10	1.20995E-10	1.20963E-10	1.20921E-10
CA	20	45	1.42623E+07	4.65314E-08	6.67212E-10	2.17451E-11	1.01620E-14	2.21925E-21	4.84654E-28	5.04806E-48	1.16825E-74
CA	20	47	3.91680E+05	2.61195E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	46	7.25049E+06	1.00113E-12	1.17639E-16	2.81624E-19	7.91123E-26	6.25151E-39	6.93991E-52	0.00000E+00	0.00000E+00
SC	21	47	2.96217E+05	1.18120E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	48	1.58253E+05	2.37903E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	49	3.46049E+03	1.19045E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	50	1.03147E+02	3.80936E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	3.48315E+02	3.02604E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	49	2.85246E+07	2.32770E-16	2.33244E-17	5.03195E-18	1.08779E-19	5.08343E-22	[illegible].37561E-26	2.42467E-36	1.15631E-49
V	23	52	2.02084E+02	7.77011E-07	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39043E+06	8.06150E-12	1.05666E-23	1.26553E-31	1.98670E-51	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	4.68998E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	9.85370E-20	9.85370E-20	9.85369E-20	9.85368E-20	9.85366E-20	9.85364E-20	9.85359E-20	9.85352E-20
MN	25	54	2.61565E+07	1.97559E-10	1.60761E-11	3.01819E-12	4.61103E-14	1.07622E-17	2.51184E-21	3.19368E-32	9.47723E-47
MN	25	56	9.29152E+03	9.64216E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	2.54043E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	2.42847E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	5.61840E-06	2.52455E-06	1.48103E-06	3.90406E-07	2.71281E-08	1.88504E-09	6.32455E-13	1.47449E-17
FE	26	59	3.89409E+06	6.68946E-08	3.21196E-15	4.24310E-20	2.69147E-32	1.08285E-56	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	60	1.65903E+08	2.94408E-08	1.98266E-08	1.52329E-08	7.88164E-09	2.11000E-09	5.64872E-10	1.08380E-11	5.56695E-14
TOTAL (CURIES/CC)				8.90841E-06	4.26775E-06	3.03516E-06	1.55852E-06	6.88799E-07	3.77415E-07	6.89781E-08	7.30847E-09
TOTAL (CURIES)				2.44081E+02	1.16894E+02	8.31324E+01	4.26878E+01	1.88662E+01	1.03376E+01	1.88931E+00	2.00179E-01

COMPONENT : CORE SUPPORT FLOOR KAOWOOL AND COVER PLATES - R5
VOLUME : 3.23900E+06 CC
: ABOVE VOLUME IS FOR THE COMPOSITE MIXTURE OF THE KAOWOOL
: AND COVER PLATE LAYER ON THE CORE SUPPORT FLOOR.
:
: (INTERVAL 54 TOTGDNRS)

NUCLIDE			HALF-LIFE	CONCENTRATION (CURIES/CC) AT TIME							
SYM	Z	N	(SECONDS)	SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
LI	3	8	8.40178E-01	5.04127E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	8	3.00064E-16	5.74092E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	10	7.08563E+13	6.39171E-18	6.39170E-18	6.39170E-18	6.39169E-18	6.39167E-18	6.39166E-18	6.39160E-18	6.39153E-18
B	5	12	1.99754E-02	2.20853E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
C	6	14	1.80970E+11	3.45563E-12	3.45438E-12	3.45354E-12	3.45146E-12	3.44729E-12	3.44312E-12	3.43066E-12	3.41411E-12
F	9	20	1.10023E+01	5.09630E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NE	10	25	3.76710E+01	8.24509E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NA	11	24	5.41521E+04	8.50652E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MG	12	27	5.68153E+02	2.37030E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AL	13	28	1.38629E+02	5.12100E-06	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SI	14	31	9.43057E+03	6.95119E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	1.59035E-11	1.36612E-34	6.72999E-50	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AR	18	37	3.02684E+06	1.46673E-12	5.63397E-22	2.97708E-28	6.04297E-44	2.40957E-75	0.00000E+00	0.00000E+00	0.00000E+00
AR	18	39	8.48405E+09	7.52036E-18	7.46242E-18	7.42404E-18	7.32895E-18	7.14240E-18	6.96061E-18	6.44251E-18	5.81121E-18
CA	20	41	2.52053E+12	2.01974E-12	2.01968E-12	2.01965E-12	2.01956E-12	2.01939E-12	2.01921E-12	2.01868E-12	2.01798E-12
CA	20	45	1.42623E+07	7.75399E-10	7.78563E-12	3.62360E-13	1.69339E-16	3.69815E-23	8.07634E-30	8.41208E-50	1.91344E-76
CA	20	47	3.91608E+05	4.02543E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	46	7.25049E+06	1.08552E-12	1.27339E-16	3.05146E-19	8.57810E-26	6.77847E-39	5.35631E-52	0.00000E+00	0.00000E+00
SC	21	47	2.96217E+05	1.22417E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	48	1.58253E+05	2.63220E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	49	3.44849E+03	1.27687E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	50	1.03147E+02	4.04708E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	3.48315E+02	4.65786E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000[illegible]	0.00000E+00	0.00000E+00	0.00000E+00
V	23	49	2.85246E+07	6.33847E-16	6.35139E-17	1.37[illegible]3E-17	2.96211E-19	1.386[illegible]	6.46093E-26	6.60197E-36	3.14871E-49
V	23	52	2.02084E+02	5.81179E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.0000[illegible]	0.00000E+00	0.00000E+00	0.00000E+00
V	23	53	1.19922E+02	1.16616E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	54	5.50117E+01	1.20268E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39843E+06	2.98670E-07	3.91480E-19	4.68867E-27	7.36083E-47	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	3.16968E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	8.38656E-19	8.38655E-19	8.38655E-19	8.38654E-19	8.38652E-19	8.38651E-19	8.38646E-19	8.38640E-19
MN	25	54	7.61565E+07	1.44654E-09	1.17859E-10	2.21380E-11	3.38089E-13	7.89105E-17	1.84173E-20	2.34165E-31	6.94889E-46
MN	25	56	9.29152E+03	1.28395E-05	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	1.96349E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	2.86706E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	5.99178E-05	2.69232E-05	1.57945E-05	4.16351E-06	2.89309E-07	2.01031E-08	6.74485E-12	1.57248E-16
FE	26	59	3.89409E+06	7.11433E-07	3.41597E-14	4.51260E-19	2.86242E-31	1.15163E-55	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	60	3.15569E+12	9.20921E-23	9.20902E-23	9.20889E-23	9.20857E-23	9.20793E-23	9.20730E-23	9.20538E-23	9.20283E-23
FE	26	61	3.60001E+02	1.14392E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	57	2.34838E+07	3.63463E-13	2.22272E-14	3.45012E-15	3.27499E-17	2.95091E-21	2.65889E-25	1.94510E-37	1.28211E-53
CO	27	58	6.13405E+06	2.00319E-10	4.52511E-15	3.61608E-18	6.52759E-26	2.12781E-41	6.93087E-57	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	1.02680E-06	6.91487E-07	5.31273E-07	2.74885E-07	7.35899E-08	1.97008E-08	3.77994E-10	1.94157E-12
CO	27	61	5.94007E+03	1.62079E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	62	8.34012E+02	4.10950E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	64	2.99999E-01	3.13024E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NI	28	59	2.52053E+12	1.71923E-10	1.71918E-10	1.71915E-10	1.71908E-10	1.71893E-10	1.71878E-10	1.71833E-10	1.71774E-10
NI	28	63	2.90020E+09	2.45455E-08	2.39963E-08	2.36371E-08	2.27623E-08	2.11086E-08	1.95751E-08	1.56112E-08	1.15456E-08
NI	28	65	9.21738E+03	4.59565E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CU	29	64	6.62098E+04	3.55592E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
			TOTAL (CURIES/CC)	8.00688E-05	2.76309E-05	1.63496E-05	4.46133E-06	3.84185E-07	5.95564E-08	1.61733E-08	1.17247E-08
			TOTAL (CURIES)	2.59343E+02	8.95225E+01	5.29564E+01	1.44502E+01	1.24437E+00	1.92903E-01	5.23852E-02	3.79763E-02

COMPONENT : CORE SUPPORT FLOOR LINER - RS
VOLUME : 1.39000E+06 CC
: ABOVE VOLUME IS FOR THE CSF LINER ON TOP OF THE CSF
:
:
: (INTERVAL 55 TOTGDMRS)

NUCLIDE SYM	Z	M	HALF-LIFE (SECONDS)	CONCENTRATION (CURIES/CC) AT TIME SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
AL	13	28	1.30629E+02	3.59792E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SI	14	31	9.43057E+03	6.55703E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	9.49686E-11	8.15616E-34	3.42090E-49	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	3.48315E+02	6.75166E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	49	2.05246E+07	6.70503E-15	6.71870E-16	1.44947E-16	3.13341E-18	1.46430E-21	6.84304E-25	6.98377E-35	3.33081E-48
V	23	52	2.02004E+02	6.15324E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	53	1.19922E+02	1.21515E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	54	5.50117E+01	1.27209E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39843E+06	1.50060E-06	2.07187E-18	2.48143E-26	3.89565E-46	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	6.69876E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	6.29845E-18	6.29845E-18	6.29845E-18	6.29844E-18	6.29843E-18	6.29842E-18	6.29838E-18	6.29833E-18
MN	25	54	2.61565E+07	1.05732E-08	8.60272E-10	1.61531E-10	2.46778E-12	5.75983E-16	1.34432E-19	1.70922E-30	5.07213E-45
MN	25	56	9.29152E+03	1.39772E-04	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	1.44647E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	1.55059E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	2.24125E-04	1.00707E-04	5.90801E-05	1.55738E-05	1.08217E-06	7.51966E-08	2.52294E-11	5.88193E-16
FE	26	59	3.89409E+06	2.66748E-06	1.28080E-13	1.69198E-18	1.07325E-30	4.31799E-55	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	60	3.15569E+12	2.02037E-22	2.02033E-22	2.02030E-22	2.02023E-22	2.02009E-22	2.01995E-22	2.01953E-22	2.01897E-22
FE	26	61	3.60001E+02	1.51002E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	57	2.34838E+07	[illegible].97454E-13	4.87674E-14	7.56971E-15	7.18547E-17	6.47643E-21	5.83373E-25	4.26763E-37	2.81301E-53
CO	27	58	6.13405E+06	6.[illegible]8330E-10	9.67577E-15	7.73205E-18	1.39576E-25	4.56807E-41	1.68199E-56	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	2.[illegible]2065E-06	1.63017E-06	1.25247E-06	6.48037E-07	1.73487E-07	6.64464E-08	8.91115E-10	4.57721E-12
CO	27	61	5.94007E+03	3.4[illegible]73E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	62	8.34012E+02	2.37[illegible]E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	64	2.99999E-01	6.86840E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NI	28	59	2.52053E+12	1.88096E-10	1.88091E-10	1.88087E-10	1.88079E-10	1.88063E-10	1.88047E-10	1.87998E-10	1.87932E-10
NI	28	63	2.90020E+09	2.68370E-08	2.62366E-08	2.58438E-08	2.48873E-08	2.30793E-08	2.14026E-08	1.70687E-08	1.26234E-08
NI	28	65	9.21734E+03	1.98727E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CU	29	64	4.62098E+04	7.85973E-06	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	88	7.26602E+06	4.70474E-16	5.21917E-20	1.20497E-22	3.08624E-29	2.02[illegible]46E-62	1.32797E-55	0.00000E+00	0.00000E+00
ZR	40	89	2.82249E+05	6.63522E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	93	4.74758E+13	3.37853E-20	3.37852E-20	3.37852E-20	3.37851E-20	3.37850E-20	3.37848E-20	3.37844E-20	3.37837E-20
ZR	40	95	5.63534E+06	1.04888E-14	9.19336E-20	3.90820E-23	1.45622E-31	2.02169E-48	2.80674E-65	0.00000E+00	0.00000E+00
ZR	40	97	6.94840E+04	1.45971E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	91	2.20888E+10	1.48079E-17	1.47640E-17	1.47348E-17	1.46620E-17	1.45175E-17	1.43765E-17	1.39537E-17	1.34118E-17
NB	41	92	8.80746E+05	3.00687E-13	1.31806E-45	3.53020E-67	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	94	6.30134E+11	4.47151E-18	4.47106E-18	4.47073E-18	4.46996E-18	4.46841E-18	4.46686E-18	4.46221E-18	4.45601E-18
NB	41	95	3.02604E+06	8.73617E-14	3.35573E-23	1.77321E-29	3.59933E-45	1.68285E-76	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	96	8.28132E+04	1.57008E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	97	4.33217E+03	1.52972E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	98	3.06025E+03	4.14278E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	100	3.09996E+00	2.64793E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	93	2.84077E+11	1.95618E-14	1.95573E-14	1.95543E-14	1.95466E-14	1.95[illegible]E-14	1.95167E-14	1.94717E-14	1.94118E-14
MO	42	99	2.61515E+05	1.67704E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	101	8.76292E+02	8.20789E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TOTAL (CURIES/CC)				3.78486E-04	1.02365E-04	6.03500E-05	1.62468E-05	1.27892E-06	1.43232E-07	1.81730E-08	1.28160E-08
TOTAL (CURIES)				5.26096E+02	1.42287E+02	8.38987E+01	2.25831E+01	1.77770E+00	1.99092E-01	2.52605E-02	1.78142E-02

COMPONENT : LARGE PERMANENT REFLECTORS - RS
VOLUME : 1.01490E+08 CC
: ABOVE VOLUME IS THE TOTAL VOLUME OF ALL PERMANENT AND
: IRREGULAR BLOCKS. 54 HEX BLKS AT 8.85+4 CC EACH.
: 288 PERM BLKS AT 3.3580+5 CC EACH.
: (INTERVALS 35-45 TOTGRDRS)

NUCLIDE SYM	Z	M	HALF-LIFE (SECONDS)	CONCENTRATION (CURIES/CC) AT TIME SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
H	1	3	3.87233E+08	9.63679E-04	8.13457E-04	7.26557E-04	5.67782E-04	3.11374E-04	1.76994E-04	3.25076E-05	3.39379E-06
HE	2	6	8.09751E-01	2.01652E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
LI	3	8	8.40178E-01	8.02199E-06	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	8	3.00066E-16	4.96162E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	10	7.88563E+13	2.79970E-14	2.79970E-14	2.79970E-14	2.79970E-14	2.79969E-14	2.79968E-14	2.79966E-14	2.79963E-14
B	5	12	1.99754E-02	1.81906E-06	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NA	11	24	5.41521E+04	4.61231E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MG	12	27	5.68153E+02	2.06294E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AL	13	28	1.30629E+02	3.56206E-04	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	1.60910E-08	1.30223E-31	5.79753E-67	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AR	18	37	3.02684E+06	1.96874E-08	7.56232E-18	3.99604E-24	[illegible].11130E-40	3.34169E-71	0.00000E+00	0.00000E+00	0.00000E+00
AR	18	39	8.48405E+09	7.68396E-14	7.62476E-14	7.58554E-14	7.48838E-14	7.29778E-14	7.11203E-14	6.58267E-14	5.93763E-14
CA	20	41	2.52053E+12	1.98126E-07	1.98119E-07	1.98116E-07	1.98107E-07	1.98090E-07	1.98073E-07	1.98021E-07	1.97953E-07
CA	20	45	1.42623E+07	7.59965E-05	7.63066E-07	3.55147E-08	1.65969E-11	3.62454E-18	7.91558E-25	8.24465E-45	1.87536E-71
CA	20	47	3.91600E+05	3.98043E-07	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	46	7.25009E+06	1.93071E-10	2.26084E-16	5.42736E-17	[illegible].52571E-23	1.20563E-36	9.52678E-50	0.00000E+00	0.00000E+00
SC	21	47	2.96217E+05	3.19163E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	48	1.58253E+05	3.09645E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	49	3.44849E+03	2.37526E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	50	1.03147E+02	4.43173E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	3.48315E+02	6.69820E-06	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	49	2.05246E+07	7.16232E-14	7.17692E-15	1.54832E-15	3.34711E-17	1.56417E-20	7.30973E-24	7.46007E-34	3.55797E-47
V	23	52	2.02084E+02	3.81653E-03	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39843E+06	1.56416E-09	2.85021E-21	2.45549E-29	3.05493E-49	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	5.11107E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	1.06076E-17	1.06073E-17	1.06073E-17	1.06073E-17	1.06073E-17	1.06073E-17	1.06072E-17	1.06072E-17
MN	25	54	2.61565E+07	3.64946E-08	2.96933E-09	5.57542E-10	8.51782E-12	1.98807E-15	4.64006E-19	5.09955E-30	1.75070E-44
MN	25	56	9.29152E+03	1.25900E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	3.65009E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	2.63231E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	9.67291E-03	4.34638E-03	2.549[illegible]E-03	6.72142E-04	4.67050E-05	3.24538E-06	1.08884E-09	2.53854E-14
FE	26	59	3.89409E+06	1.14683E-04	5.50652E-12	7.27[illegible]29E-17	4.61420E-29	1.85642E-53	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	5.04223E-05	3.39566E-05	2.6[illegible]89E-05	1.34906E-05	3.61374E-06	9.67439E-07	1.05620E-08	9.53435E-11
TOTAL (CURIES/CC)				1.50676E-02	5.19476E-03	3.30270E-03	1.23362E-03	3.61891E-04	1.[illegible]1405E-04	3.27252E-05	3.59184E-06
TOTAL (CURIES)				1.52919E+06	5.27216E+05	3.35191E+05	1.2520[illegible]E+05	3.67283E+04	1.8[illegible]08E+04	3.32128E+03	3.64536E+02

COMPONENT : METAL SHELL FOR LARGE SIDE REFLECTOR - SEE ** BELOW
VOLUME : 3.88272E+05 CC
: ABOVE VOLUME IS FOR THE TOTAL NUMBER OF SHELLS IN THE PCRV
: ONE SHELL : 1.6178+3 - 24 SHELLS PCRV TOTAL
: ** USE ORIGINAL CALC FROM T8284.REBATE.L133(LARGEREF)
: (INTERVAL 2 LARGEREF)

NUCLIDE SYM	Z	M	HALF-LIFE (SECONDS)	CONCENTRATION (CURIES/CC) AT TIME SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
AL	13	28	1.38629E+02	3.78514E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SI	14	31	9.43057E+03	4.99108E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	1.00773E-13	8.65649E-37	3.63084E-52	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	3.48315E+02	1.23672E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	49	2.85246E+07	1.26665E-17	1.26924E-18	2.73820E-19	5.91936E-21	2.76623E-24	1.29273E-27	1.31931E-37	6.29226E-51
V	23	52	2.02084E+02	2.03040E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	53	1.19922E+02	3.14565E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	54	5.[illegible]0117E+01	2.29544E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39843E+06	2.76937E-08	3.62993E-20	4.34749E-28	6.82521E-48	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	1.85905E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	3.38065E-21	3.38065E-21	3.38065E-21	3.38065E-21	3.38064E-21	3.38063E-21	3.38061E-21	3.38059E-21
MN	25	54	2.61565E+07	1.05218E-11	8.56891E-13	1.60746E-13	2.45579E-15	5.73184E-19	1.33778E-22	1.70091E-33	5.04748E-48
MN	25	56	9.29152E+03	7.73625E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	9.13389E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	6.06876E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	[illegible]	55	8.20292E+07	7.21408E-08	3.24154E-08	1.90166E-08	5.01285E-09	3.48327E-10	2.42041E-11	8.12078E-15	1.89327E-19
FE	26	[illegible]	3.89409E+06	3.72281E-09	1.78752E-16	2.36137E-21	1.49786E-33	6.02629E-58	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	5.34840E-09	3.60184E-09	2.76731E-09	1.43183E-09	3.83317E-10	1.02618E-10	1.96891E-12	1.01133E-14
TOTAL (CURIES/CC)				1.86280E-07	3.60181E-08	2.17841E-08	6.44468E-09	7.31644E-10	1.26822E-10	1.97703E-12	1.01135E-14
TOTAL (CURIES)				7.23271E-02	1.39848E-02	8.45814E-03	2.50229E-03	2.84077E-04	4.92416E-05	7.67624E-07	3.92678E-09

COMPONENT : METAL CLAD BLOCK - NON CONTROL ROD WITH COOLANT HOLES R5
VOLUME : 1.81692E+06 CC
: ABOVE VOLUME IS THE TOTAL METAL VOLUME FOR THE NCR ELEMENTS
: WITH COOLANT HOLES. 210 ELEMENTS AT 8.652+3 CC EACH.
: VOLUME OF BORON GRANULES IS 5.51+3 CC.
: (INTERVALS 29-39 TOTGUPRS)

NUCLIDE SYM	Z	M	HALF-LIFE (SECONDS)	CONCENTRATION (CURIES/CC) AT TIME SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
LI	3	8	8.40178E-01	1.71846E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	8	3.00064E-16	2.66747E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	10	7.88563E+13	3.82920E-13	3.82920E-13	3.82920E-13	3.82919E-13	3.82918E-13	3.82917E-13	3.82914E-13	3.82909E-13
B	5	12	1.99754E-02	1.37545E-05	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AL	13	28	1.38629E+02	1.26447E-07	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SI	14	31	9.43057E+03	1.24712E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	2.28120E-08	1.[illegible]5956E-31	8.21918E-47	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	3.48315E+02	1.20590E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	49	2.85246E+07	1.18979E-11	1.19222E-12	2.57205[illegible]-13	5.56017E-15	2.59837E-18	1.21428E-21	1.23926E-31	5.91045E-45
V	23	52	2.02084E+02	1.21458E-07	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	53	1.19922E+02	2.39361E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	54	5.50117E+01	2.25801E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39843E+06	9.88843E-03	1.29612E-14	1.55233E-22	2.43704E-42	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	5.84632E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	1.32021E-15	1.32021E-15	1.32021E-15	1.32021E-15	1.32020E-15	1.32020E-15	1.32020E-15	1.32019E-15
MN	25	54	2.61565E+07	2.81750E-06	2.29242E-07	4.30441E-08	6.57604E-10	1.53486E-13	3.58228E-17	4.55465E-28	1.35160E-42
MN	25	56	9.29152E+03	3.61367E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	3.49980E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	3.26099E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	1.64265E-01	7.47086E-02	4.38280E-02	1.15532E-02	8.02797E-04	5.57830E-05	1.87162E-08	4.36345E-13
FE	26	59	3.89409E+06	1.97697E-03	9.49258E-11	1.25399E-15	7.95427E-28	3.20022E-52	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	1.82178E-03	1.22686E-03	9.42606E-04	4.87713E-04	1.30566E-04	3.49540E-05	6.70653E-07	3.44481E-09
ZR	40	88	7.20602E+06	1.32100E-12	1.46544E-16	3.38333E-19	8.66555E-26	5.60429E-39	3.72869E-52	0.00000E+00	0.00000E+00
ZR	40	89	2.82249E+05	1.24666E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	93	4.74758E+13	9.21946E-17	9.21945E-17	9.21944E-17	9.21942E-17	9.21937E-17	9.21933E-17	9.21920E-17	9.21903E-17
ZR	40	95	5.63534E+06	2.78211E-11	2.43849E-16	1.03463E-19	3.86255E-28	5.36243E-45	7.44474E-62	0.00000E+00	0.00000E+00
ZR	40	97	6.04840E+04	3.79833E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	91	2.20888E+10	3.72391E-14	3.72206E-14	3.70551E-14	3.68721E-14	3.65088E-14	3.61490E-14	3.50909E-14	[illegible]281E-14
NB	41	92	8.80746E+05	8.53442E-10	3.74180E-42	1.00198E-63	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	[illegible]00E+00
NB	41	94	6.30134E+11	1.22064E-14	1.22051E-14	1.22042E-14	1.22021E-14	1.21979E-14	1.21937E-14	1.21810E-14	[illegible]41E-14
NB	41	95	3.02604E+06	2.45506E-10	9.43035E-20	4.98314E-26	1.01149E-41	4.16716E-73	0.00000E+00	0.00000E+00	[illegible]000E+00
NB	41	96	8.28132E+04	4.13568E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	97	4.33217E+03	4.18424E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	98	3.06025E+03	1.04769E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	100	3.09994E+00	6.63431E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	93	2.04077E+11	1.56101E-10	1.56065E-10	1.56041E-10	1.55981E-10	1.55860E-10	1.55741E-10	1.55381E-10	1.54903E-10
MO	42	99	2.41515E+05	1.29580E-04	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	101	8.76292E+02	7.21358E-05	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TOTAL (CURIES/CC)				2.16307E-01	7.59356E-02	4.47706E-02	1.20409E-02	9.33363E-04	9.07380E-05	6.89525E-07	3.60058E-09
TOTAL (CURIES)				3.93012E+05	1.37969E+05	8.13446E+04	2.18774E+04	1.69585E+03	1.64864E+02	1.25281E+00	6.54196E-03

COMPONENT : METAL CLAD BLOCK - NON CONTROL ROD COLUMN WITHOUT COOLANT HOLES R5
VOLUME : 4.54140E+05 CC
: ABOVE VOLUME IS THE TOTAL METAL VOLUME FOR NCR ELEMENTS
: WITHOUT COOLANT HOLES.
: 60 ELEMENTS AT 7.569+3 CC EACH.
: (INTERVALS 29-39 TOTGUPR5)

NUCLIDE SYM	Z	N	HALF-LIFE (SECONDS)	CONCENTRATION (CURIES/CC) AT TIME SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
LI	3	8	8.40178E-01	1.71846E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	8	3.00064E-16	2.66747E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	10	7.88563E+13	3.82920E-13	3.82920E-13	3.82920E-13	3.82919E-13	3.82918E-13	3.82917E-13	3.82914E-13	3.82909E-13
B	5	12	1.99756E-02	1.37945E-05	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AL	13	28	1.38629E+02	1.26447E-07	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SI	14	31	9.43057E+03	1.24712E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	2.28120E-08	1.95956E-31	8.21910E-47	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	3.68315E+02	1.20590E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	49	2.85246E+07	1.10979E-11	1.19222E-12	2.57205E-13	5.56017E-15	2.59837E-18	1.21428E-21	1.23926E-31	5.91045E-45
V	23	52	2.02084E+02	1.21450E-07	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	53	1.19922E+02	2.39361E-07	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	54	5.50117E+01	2.25801E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39843E+06	9.80043E-03	1.29412E-14	3.55233E-22	2.43704E-42	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	5.06632E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	1.32021E-15	1.32021E-15	1.32021E-15	1.32021E-15	1.32020E-15	1.32020E-15	1.32020E-15	1.32019E-15
MN	25	54	2.61565E+07	2.81750E-06	2.29242E-07	4.30441E-08	6.57604E-10	1.53486E-13	3.58228E-17	4.55465E-28	1.35160E-42
MN	25	56	9.29152E+03	3.61367E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	3.49980E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	3.26099E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	1.66265E-01	7.47086E-02	4.38280E-02	1.15532E-02	8.02797E-04	5.57838E-05	1.87162E-08	4.36345E-13
FE	26	59	3.89409E+06	1.97697E-03	9.49250E-11	1.25399E-15	7.95427E-28	3.20022E-52	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	1.82178E-03	1.22686E-03	9.42606E-04	4.87713E-04	1.30566E-04	3.49540E-05	6.70653E-07	3.64481E-09
ZR	40	88	7.20602E+06	1.32100E-12	1.46544E-16	3.38333E-19	8.66555E-26	5.68429E-39	3.72069E-52	0.00000E+00	0.00000E+00
ZR	40	89	2.82249E+05	1.24666E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	93	4.74750E+13	9.21946E-17	9.21945E-17	9.21944E-17	9.21942E-17	9.21937E-17	9.21933E-17	9.21920E-17	9.21903E-17
ZR	40	95	5.63534E+06	2.78211E-11	2.43849E-16	1.03663E-19	3.86255E-28	5.36243E-45	7.66474E-62	0.00000E+00	0.00000E+00
ZR	40	97	6.04840E+04	3.79833E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	91	2.20888E+10	3.72391E-16	3.71286E-14	3.70551E-14	3.68721E-14	3.65088E-14	3.61490E-14	3.50909E-14	[illegible]7281E-16
NB	41	92	8.80746E+05	8.53442E-10	3.74106E-42	1.00198E-63	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	[illegible]00E+00
NB	41	94	6.30134E+11	1.22066E-16	1.22051E-16	1.22042E-14	1.22021E-14	1.21979E-14	1.21937E-14	1.21810E-14	[illegible]41E-14
NB	41	95	3.02604E+06	2.45506E-10	9.43035E-20	4.90314E-26	1.01[illegible]9E-41	4.16714E-73	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	96	8.28132E+04	4.13568E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	97	4.33217E+03	4.10426E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	98	3.06025E+03	1.84769E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	100	3.09996E+00	6.63431E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	93	2.04077E+11	1.56101E-10	1.56065E-10	1.56041E-10	1.55981E-10	1.55860E-10	1.55761E-10	1.55381E-10	1.54903E-10
MO	42	99	2.41515E+05	1.29580E-04	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	101	8.76292E+02	7.21358E-05	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TOTAL (CURIES/CC)				2.16307E-01	7.59356E-02	4.67706E-02	1.20409E-02	9.33363E-04	9.07380E-05	6.89525E-07	3.60058E-09
TOTAL (CURIES)				9.82336E+04	3.44856E[illegible]	2.03321E+04	5.46827E+03	4.23877E+02	4.12077E+01	3.13141E-01	1.63517E-03

COMPONENT : ORIFICE VALVE - R5
VOLUME : 1.59208E+06 CC
: ABOVE VOLUME IS THE TOTAL VOLUME OF ALL ORIFICE VALVES AND
: LOWER GUIDE TUBES.
: 37 TOTAL DEVICES AT 4.302+4 CC EACH.
: (INTERVALS 36-39 UPOVR5)

NUCLIDE SYM	Z	N	HALF-LIFE (SECONDS)	CONCENTRATION (CURIES/CC) AT TIME SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
SI	14	31	9.43057E+03	8.16166E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	1.78782E-08	1.53575E-31	6.44168E-47	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	52	2.02084E+02	1.09986E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39843E+06	5.86930E-08	7.66692E-20	9.10251E-28	1.64158E-67	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	7.23635E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	6.93264E-16	6.93263E-16	6.93263E-16	6.93262E-16	6.93261E-16	6.93260E-16	6.93256E-16	6.93251E-16
MN	25	54	2.61565E+07	1.32577E-06	1.07869E-07	2.02543E-08	3.09436E-10	7.22224E-14	1.68564E-17	2.14310E-28	6.35994E-43
MN	25	56	9.29152E+03	4.23036E-04	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	1.70119E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	1.70459E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	4.10330E-04	1.87971E-04	1.10273E-04	2.90685E-05	2.01984E-06	1.40355E-07	4.70908E-11	1.09787E-15
FE	26	59	3.89409E+06	9.25611E-06	4.44435E-13	5.87113E-18	3.72416E-30	1.69033E-54	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	1.07707E-04	7.25081E-05	5.57697E-05	2.88558E-05	7.72502E-06	2.06807E-06	3.96795E-08	2.03814E-10
TOTAL (CURIES/CC)				9.59045E-04	2.60667E-04	1.66063E-04	5.79246E-05	9.74498E-06	2.20843E-06	3.97266E-08	2.03816E-10
TOTAL (CURIES)				1.52807E+03	4.14981E+02	2.64373E+02	9.22160E+01	1.55139E+01	3.51582E+00	6.32647E-02	3.24474E-04

COMPONENT : RADIAL COVER PLATE - R5
VOLUME : 4.45840E+06 CC
: ABOVE VOLUME IS FOR BOTH LAYERS OF THE COVER PLATES
: ON THE SIDES OF THE PCRV ABOVE THE CSF.
:
: (INTERVAL 58 TOTGRDRS)

NUCLIDE			HALF-LIFE	CONCENTRATION (CURIES/CC) AT TIME							
SYM	Z	N	(SECONDS)	SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
AL	13	28	1.38629E+02	1.[illegible]9E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SI	14	31	9.43057E+03	[illegible]47918E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	5.66557E-11	4.86676E-34	2.04129E-49	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	52	2.02084E+02	1.99352E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39043E+06	2.46020E-10	3.22468E-22	3.86213E-30	6.06324E-50	0.[illegible]E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	1.27973E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.000[illegible]+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	3.64215E-18	3.64215E-18	3.64214E-18	3.64214E-18	3.64213E-18	3.64213E-18	3.64211E-18	3.64208E-18
MN	25	54	2.61565E+07	5.13955E-09	4.18171E-10	7.85109E-11	1.19957E-12	2.79981E-16	6.53462E-20	8.30836E-31	2.46552E-45
MN	25	56	9.29152E+03	1.28156E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	7.35622E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60149E+01	8.84024E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	1.30395E-07	5.85912E-08	3.43727E-08	9.06078E-09	6.29604E-10	4.37492E-11	1.46784E-14	3.42210E-19
FE	26	59	3.89409E+06	6.76759E-09	3.24948E-16	4.29267E-21	2.72291E-33	1.09550E-57	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	7.89382E-09	5.31602E-09	4.08432E-09	2.11327E-09	5.65745E-10	1.51456E-10	2.90595E-12	1.49264E-14
TOTAL (CURIES/CC)				1.65251E-07	6.43254E-08	3.85355E-08	1.11752E-08	1.19535E-09	1.95206E-10	2.92063E-12	1.49304E-14
TOTAL (CURIES)				7.36753E-01	2.86788E-01	1.71807E-01	4.98237E-02	5.32935E-03	8.70305E-04	1.30213E-05	6.65656E-08

COMPONENT : RADIAL KAOWOOL - R5
VOLUME : 2.55900E+07 CC
: ABOVE VOLUME IS FOR BOTH LAYERS OF KAOWOOL
: ON THE SIDES OF THE PCRV ABOVE THE CSF.
:
: (INTERVAL 59 TOTGRDRS)

NUCLIDE			HALF-LIFE	CONCENTRATION (CURIES/CC) AT TIME							
SYM	Z	N	(SECONDS)	SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
LI	3	8	8.40178E-01	1.21694E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	8	3.00064E-16	1.22446E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	10	7.88563E+13	3.77047E-19	3.77046E-19	3.77046E-19	3.77046E-19	3.77046E-19	3.77043E-19	3.77040E-19	3.77036E-19
B	5	12	1.99754E-02	5.18622E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
C	6	14	1.80978E+11	6.87197E-15	6.86948E-15	6.86782E-15	6.86367E-15	6.85538E-15	6.84710E-15	6.82232E-15	6.78942E-15
F	9	20	1.10023E+01	1.16372E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NE	10	23	3.76710E+01	1.70778E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NA	11	24	5.41521E+04	4.13295E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MG	12	27	5.68153E+02	4.80478E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AL	13	28	1.38629E+02	1.35578E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AR	18	37	3.02684E+06	2.98038E-12	1.16482E-21	6.04940[illegible]28	1.22793E-43	5.05879E-75	0.00000E+00	0.00000E+00	0.00000E+00
AR	18	39	8.48405E+09	1.61292E-17	1.60049E-17	1.5972[illegible]7	1.57187E-17	1.53186E-17	1.49287E-17	1.38175E-17	1.24635E-17
CA	20	41	2.52053E+12	2.98595E-15	2.98587E-15	2.985[illegible]5	2.98569E-15	2.98543E-15	2.98517E-15	2.98439E-15	2.98336E-15
CA	20	45	1.42623E+07	3.36171E-12	3.37543E-14	1.571[illegible]15	7.34164E-19	1.60332E-25	3.50146E-32	3.64702E-52	8.29564E-79
CA	20	47	3.91608E+05	6.67[illegible]99E-15	0.00000E+00	0.0000[illegible]00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	46	7.25049E+06	2.29520E-12	2.69243E-16	6.45196[illegible]19	1.81374E-25	1.43323E-38	1.13253E-[illegible]	0.00000E+00	0.00000E+00
SC	21	47	2.96217E+05	2.83966E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	48	1.58253E+05	6.11297E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	49	3.66849E+03	2.66957E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	50	1.03147E+02	1.02062E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	3.48315E+02	1.19849E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00[illegible]E+[illegible]	0.00000E+00	0.00000E+00	0.00000E+00
TOTAL (CURIES/CC)				1.44805E-08	4.30953E-14	1.14416E-14	9.86619E-15	9.85650E-15	9.84757E-15	9.82090E-15	9.78561E-15
TOTAL (CURIES)				3.70556E-01	1.12328E-06	2.92790E-07	2.52476E-07	2.52228E-07	2.51999E-07	2.51317E-07	2.50414E-07

COMPONENT : RADIAL PCRV LINER - R5
VOLUME : 7.00000E+06 CC
: ABOVE VOLUME IS FOR THE PCRV LINER AND COOLING TUBES
: ON THE SIDES OF THE PCRV ABOVE THE CSF.
:
: (INTERVAL 60 TOTGRDRS)

NUCLIDE SYM	Z	M	HALF-LIFE (SECONDS)	CONCENTRATION (CURIES/CC) AT TIME SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
AL	13	28	1.38629E+02	8.62084E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SI	14	31	9.43057E+03	1.05390E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	2.19739E-10	1.88758E-33	7.91716E-49	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	3.48315E+02	1.80647E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	49	2.85246E+07	1.85082E-14	1.85459E-15	4.00102E-16	8.64928E-18	4.04197E-21	1.88891E-24	1.92776E-34	9.19416E-48
V	23	52	2.02084E+02	1.53388E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	53	1.19922E+02	2.95678E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	54	5.50117E+01	3.50586E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39843E+06	3.38094E-08	4.43154E-20	5.30756E-28	8.33245E-48	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	1.56079E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	1.73857E-17	1.73857E-17	1.73857E-17	1.73857E-17	1.73857E-17	1.73857E-17	1.73856E-17	1.73854E-17
MN	25	54	2.61565E+07	2.42446E-08	1.97263E-09	3.70394E-10	5.65868E-12	1.32074E-15	3.08255E-19	3.91927E-30	1.16305E-44
MN	25	56	9.29152E+03	3.08779E-06	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	3.45830E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	[illegible].21157E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	3.05247E-06	1.37159E-06	8.[illegible]644E-07	2.12107E-07	1.47387E-08	1.02414E-09	3.43612E-13	8.01092E-18
FE	26	59	3.89409E+06	6.41219E-08	3.07883E-15	4.06724E-20	2.57992E-32	1.03797E-56	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	60	3.15569E+12	5.56294E-22	5.56282E-22	5.56275E-22	5.56256E-22	5.56217E-22	5.56178E-22	5.56063E-22	5.55909E-22
FE	26	61	3.60001E+02	6.92727E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	57	2.34838E+07	2.19837E-12	1.34439E-13	2.08677E-14	1.98084E-16	1.78483E-20	1.60820E-24	1.17647E-36	7.75473E-53
CO	27	58	6.13405E+06	1.02789E-09	2.32194E-14	1.85549E-[illegible]7	3.34946E-25	1.09142E-40	3.55640E-56	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	6.90553E-08	4.65047E-08	3.57298E-08	1.84869E-08	4.94915E-09	1.32494E-09	2.54213E-11	1.30576E-13
CO	27	61	5.94007E+03	8.13657E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	62	8.34012E+02	6.03679E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	64	2.99999E-01	1.89550E-15	0.00000E+00	0.00000E+00	0.00000E+00	[illegible]0000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NI	28	59	2.52053E+12	2.8369[illegible]E-12	2.83686E-12	2.83681E-12	2.83668E-12	[illegible]644E-12	2.83619E-12	2.83545E-12	2.83447E-12
NI	28	63	2.90020E+09	3.53138E-10	3.45237E-10	3.40068E-10	3.27483E-10	[illegible]92E-10	2.81629E-10	2.24600E-10	1.66107E-10
NI	28	65	9.21738E+03	4.65770E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CU	29	64	4.62098E+04	1.58714E-07	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	88	7.20602E+06	1.13018E-15	1.25375E-19	2.89460E-22	7.41379E-29	4.46318E-42	3.19008E-55	0.00000E+00	0.00000E+00
ZR	40	89	2.82249E+05	1.16989E-13	0.00000E+00	0.00000E+00	0.00000E+00	[illegible]00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	93	4.74758E+13	8.46618E-20	8.46617E-20	8.46616E-20	8.46615E-20	8.46611E-20	8.46607E-20	8.46595E-20	8.46580E-20
ZR	40	95	5.63534E+06	2.66702E-14	2.33762E-19	9.93748E-23	3.70277E-3[illegible]	5.14060E-48	7.13677E-65	0.00000E+00	0.00000E+00
ZR	40	97	6.04840E+04	3.74989E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	91	2.20888E+10	4.00123E-17	3.98937E-17	3.98147E-17	3.96181E-17	3.92277E-17	3.88411E-17	3.77042E-17	3.62399E-17
NB	41	92	8.80746E+05	7.34754E-13	3.22074E-45	8.62635E-67	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	94	6.30134E+11	1.12070E-17	1.12058E-17	1.12050E-17	1.12031E-17	1.11992E-17	1.11953E-17	1.11836E-17	1.11681E-17
NB	41	95	3.02684E+06	2.15040E-13	8.26010E-23	4.36476E-29	8.85973E-45	3.65002E-76	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	96	8.28132E+04	4.00410E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	97	4.33217E+03	3.82321E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	98	3.06025E+03	1.09619E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	100	3.09994E+00	7.29168E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	93	2.84077E+11	9.74333E-14	9.74108E-14	9.73958E-14	9.73583E-14	9.72834E-14	9.72085E-14	9.69842E-14	9.66860E-14
MO	42	99	2.41515E+05	6.46888E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	101	8.76292E+02	2.71454E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TOTAL (CURIES/CC)				6.50254E-06	1.42041E-06	8.41087E-07	2.30930E-07	1.99944E-08	2.63365E-09	2.53297E-10	1.69169E-10
TOTAL (CURIES)				4.55178E+01	9.94286E+00	5.88761E+00	1.61651E+00	1.39961E-01	1.84355E-02	1.77308E-03	1.18418E-03

COMPONENT : REFLECTOR KEYS - KEYS THE CORE BARREL AND THE LRG SIDE REF
VOLUME : 3.81820E+05 CC
: ABOVE VOLUME IS FOR THE TOTAL NUMBER OF KEYS IN THE CORE.
: ONE KEY : 1.5909+4 CC - 24 KEYS TOTAL.
: THIS CALC SAME AS R1 - FILE T8284.REBATE.L133(REFLKEY)
: (INTERVAL 2 REFLKEY)

NUCLIDE SYM	Z	M	HALF-LIFE (SECONDS)	CONCENTRATION (CURIES/CC) AT TIME SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
AL	13	28	1.38629E+02	1.64529E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SI	14	31	9.43057E+03	4.98549E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	1.00645E-13	8.64551E-37	3.62623E-52	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	52	2.02084E+02	3.63216E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39[illegible]3E+06	[illegible].75446E-13	6.23187E-25	7.46377E-33	1.17175E-52	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	[illegible].64893E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	3.43052E-21	3.43052E-21	3.43052E-21	3.43051E-21	3.43051E-21	3.43050E-21	3.43048E-21	3.43045E-21
MN	25	54	2.61565E+07	1.06770E-11	8.68720E-13	1.63117E-13	2.49201E-15	5.81639E-19	1.35752E-22	1.72600E-33	5.12194E-48
MN	25	56	9.29152E+03	[illegible].52311E-07	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	9.[illegible]6864E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	6.[illegible]5830E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	7.32050E-08	3.28956E-08	1.92971E-08	5.08680E-09	3.53465E-10	2.45612E-11	8.24058E-15	1.92119E-19
FE	26	59	3.89409E+06	3.77773E-09	1.81389E-16	2.39621E-21	1.51995E-33	6.11519E-58	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	5.34175E-09	3.597[illegible]E-09	2.76387E-09	1.43005E-09	3.82840E-10	1.02491E-10	1.96646E-12	1.01007E-14
TOTAL (CURIES/CC)				2.34647E-07	3.66919E-08	2.20612E-08	6.51685E-09	7.36306E-10	1.27052E-10	1.97470E-12	1.01009E-14
TOTAL (CURIES)				8.95929E-02	1.39333E-02	8.42339E-03	2.48826E-03	2.81136E-04	4.85109E-05	7.53979E-07	3.85673E-09

COMPONENT : SILICA INSULATION BLOCKS - R5
VOLUME : 9.15705E+06 CC
: ABOVE VOLUME IS THE TOTAL VOLUME OF ALL THREE LAYERS OF
: SILICA INSULATION. 2 LAYERS OF GLASSRO'K AND 1 LAYER OF
: MASSROCK.
: (INTERVAL 54 TOTGDNRS)

NUCLIDE SYM	Z	M	HALF-LIFE (SECONDS)	CONCENTRATION (CURIES/CC) AT TIME SHUTDOWN	3.. YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
LI	3	8	8.40178E-01	5.04127E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	8	3.09064E-16	5.74092E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	10	7.88563E+13	6.39171E-18	6.39170E-18	6.39170E-18	6.39169E-18	6.39167E-18	6.39166E-18	6.39160E-18	6.39153E-18
B	5	12	1.99754E-02	2.28853E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
C	6	14	1.80978E+11	3.45563E-12	3.45438E-12	3.45354E-12	3.45146E-12	3.44729E-12	3.44312E-12	3.43066E-12	3.41411E-12
F	9	20	1.10023E+01	5.09630E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NE	10	23	3.76710E+01	8.24589E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NA	11	24	5.41521E+04	8.58652E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MG	12	27	5.68153E+02	2.37030E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AL	13	28	1.38629E+02	5.12100E-06	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SI	14	31	9.43057E+03	6.95119E-12	0.00000E+00	0.00000E+00	0.00000E+60	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	1.59035E-11	1.36612E-34	5.72999E-50	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AR	18	37	3.02684E+06	1.46673E-12	5.63397E-22	2.97708E-28	6.04297E-44	2.48957E-75	0.00000E+00	0.00000E+00	0.00000E+00
AR	18	39	8.48405E+09	7.52036E-18	7.46242E-18	7.42404E-18	7.32895E-18	7.14240E-18	6.96061E-18	6.44251E-18	5.81121E-18
CA	20	41	2.52053E+12	2.01974E-12	2.01968E-12	2.0196'E-12	2.01956E-12	2.01939E-12	2.01921E-12	2.01868E-12	2.01798E-12
CA	20	45	1.42623E+07	7.75399E-10	7.78563E-12	3.62360E-13	1.69339E-16	3.69815E-23	8.07634E-30	8.41208E-50	1.91344E-76
CA	20	47	3.91608E+05	4.02543E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	46	7.25049E+06	1.08552E-12	1.27339E-16	3.05146E-19	8.57810E-26	6.77847E-39	5.35631E-52	0.00000E+00	0.00000E+00
SC	21	47	2.96217E+05	1.22417E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	48	1.58253E+05	2.63220E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	49	3.44849E+03	1.27687E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	50	1.03147E+02	4.04708E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+90	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	3.48315E+02	4.65786E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	49	2.85246E+07	6.33847E-16	6.35139E-17	1.37023E-17	2.96211E-19	1.38425E-22	6.46893E-26	6.60197E-36	3.14871E-49
V	23	52	2.02084E+02	5.81179E-12	0.00000E+00	0.00000E+00	0.00009E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	53	1.19922E+02	1.16616E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	54	5.50117E+01	1.20268E-15	0.00000E+00	0.00000E+00	0.00060E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39843E+06	2.98670E-07	3.91480E-19	4.68867E-27	7.36083E-47	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	3.16968E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	8.38656E-19	8.38655E-19	8.38655E-19	8.38654E-19	8.38652E-19	8.38651E-19	8.38646E-19	8.38640E-19
MN	25	54	2.61565E+07	1.44854E-09	1.17859E-10	2.21300E-11	3.38089E-13	7.89105E-17	1.84173E-20	2.34165E-31	6.94889E-46
MN	25	56	9.29152E+03	1.28395E-05	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	1.96349E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	2.06706E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+90	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	5.99178E-05	2.69232E-05	1.57945E-05	4.16351E-06	2.89309E-07	2.01031E-08	6.74485E-12	1.57248E-16
FE	26	59	3.89409E+06	7.11433E-07	3.41597E-14	4.51260E-19	2.86242E-31	2.15163E-55	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	60	3.15569E+12	9.20921E-23	9.20902E-23	9.20889E-23	9.20857E-23	9.20793E-23	9.20730E-23	9.20538E-23	9.20283E-23
FE	26	61	3.60001E+02	1.14392E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	57	2.34838E+07	3.63463E-13	2.22272E-14	3.45012E-15	3.27499E-17	2.95091E-21	2.65889E-25	1.94510E-37	1.28211E-53
CO	27	58	6.13405E+06	2.00319E-10	4.52511E-15	3.61608E-18	6.52759E-26	2.12701E-41	6.93087E-57	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	1.02680E-06	6.91487E-07	5.31273E-07	2.74885E-07	7.35899E-08	1.97008E-08	3.77994E-10	1.94157E-12
CO	27	61	5.94007E+03	1.62079E-13	0.00000E+60	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	62	8.34012E+02	4.10950E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	64	2.99999E-01	3.13024E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NI	28	59	2.52053E+12	1.71923E-10	1.71918E-10	1.71915E-10	1.71908E-10	1.71893E-10	1.71878E-10	1.71833E-10	1.71774E-10
NI	28	63	2.90020E+09	2.45455E-08	2.39963E-08	2.36371E-08	2.27623E-08	2.11086E-08	1.95751E-08	1.56112E-08	1.15456E-08
NI	28	65	9.21738E+03	4.59565E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CU	29	64	4.62098E+04	3.55592E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
			TOTAL (CURIES/CC)	8.00688E-05	2.76309E-05	1.63496E-05	4.46133E-06	3.84185E-07	5.95564E-08	1.61733E-08	1.17247E-08
			TOTAL (CURIES)	7.33194E+02	2.53091E+02	1.49714E+02	4.08526E+01	3.51800E+00	5.45361E-01	1.48099E-01	1.07364E-01

COMPONENT : TOP HEAD COVER PLATES - R5
VOLUME : 1.05700E+06 CC
: ABOVE VOLUME IS FOR BOTH LAYERS OF COVER PLATES
: ON THE TOP HEAD OF THE PCRV.
:
: (INTERVAL 43 TOTGUPRS)

NUCLIDE SYM	Z	M	HALF-LIFE (SECONDS)	CONCENTRATION (CURIES/CC) AT TIME SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
AL	13	28	1.38629E+02	3.81797E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SI	14	31	9.43057E+03	4.83632E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	1.10523E-09	9.49400E-33	3.98[illegible]2E-48	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	52	2.02084E+02	3.29386E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39843E+06	4.38878E-09	5.75256E-21	6.88972E-29	1.08163E-48	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	2.07307E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	5.83562E-17	5.83561E-17	5.83561E-17	5.83561E-17	5.83560E-17	5.83559E-17	5.83555E-17	5.83551E-17
MN	25	54	2.61565E+07	9.97625E-08	8.11703E-09	1.52411E-09	2.32845E-11	5.43464E-15	1.26842E-18	1.61272E-29	4.78577E-44
MN	25	56	9.29152E+03	7.51708E-06	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	1.31922E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	1.42176E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	1.11907E-05	5.02837E-06	2.94991E-06	7.77607E-07	5.40334E-08	3.75461E-[illegible]	1.25972E-12	2.93688E-17
FE	26	59	3.89409E+06	4.54697E-07	2.18324E-14	2.88413E-19	1.82945E-31	7.36039E-56	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	5.84697E-07	3.93759E-07	3.02527E-07	1.56530E-07	4.19049E-08	1.12184E-08	2.15244E-10	1.[illegible]9560E-12
TOTAL (CURIES/CC)				1.98926E-05	5.43025E-06	3.25396E-06	9.34161E-07	9.59383E-08	1.49730E-08	2.16504E-10	1.10569E-12
TOTAL (CURIES)				2.10265E+01	5.73977E+00	3.43943E+00	9.87408E-01	1.01407E-01	1.58265E-02	2.28845E-04	1.16871E-06

COMPONENT : TOP HEAD - KAOWOOL - R5
VOLUME : 7.27800E+06 CC
: ABOVE VOLUME IS FOR BOTH LAYERS OF KAOWOOL
: ON THE TOP HEAD OF THE PCRV.
:
: (INTERVAL 44 TOTGUPRS)

NUCLIDE SYM	Z	M	HALF-LIFE (SECONDS)	CONCENTRATION (CURIES/CC) AT TIME SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
LI	3	8	8.40178E-01	2.28943E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	8	3.00064E-16	2.81216E-11	0.00000E+0[illegible]	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	10	7.88563E+13	8.54431E-18	8.54431E-1[illegible]	8.54430E-18	8.54429E-18	8.54426E-18	8.54424E-18	8.54417E-18	8.54408E-18
B	5	12	1.99754E-02	3.49322E-11	0.00000E+0[illegible]	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
C	6	14	1.80978E+11	4.89937E-13	4.89759E-13	4.89641E-13	4.89345E-13	4.88754E-13	4.88164E-13	4.86397E-13	4.84051E-13
F	9	20	1.10023E+01	2.23849E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NE	10	23	3.76710E+01	3.56857E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NA	11	24	5.41521E+04	1.88837E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MG	12	27	5.68153E+02	1.03950E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AL	13	28	1.38629E+02	8.32208E-07	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AR	18	37	3.02684E+06	6.53911E-11	2.51179E-20	1.32727E-26	2.69414E-42	1.10993E-73	0.00000E+00	0.00000E+00	0.00000E+00
AR	18	39	8.48405E+09	3.29327E-16	3.26790E-16	3.25109E-16	3.20945E-16	3.12776E-16	3.04815E-16	2.82127E-16	2.54481E-16
CA	20	41	2.52053E+12	1.59928E-13	1.59924E-13	1.59921E-13	1.59914E-13	1.59900E-13	1.59887E-13	1.59845E-13	1.59789E-13
CA	20	45	1.42623E+07	1.61459E-10	1.62117E-12	7.54528E-14	3.52609E-17	7.70053E-24	1.68171E-30	1.75162E-50	3.98430E-77
CA	20	47	3.91608E+05	3.33238E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	46	7.25049E+06	5.80565E-11	5.87195E-15	1.40712E-17	3.95561E-24	3.12575E-37	2.46995E-50	0.00000E+00	0.00000E+00
SC	21	47	2.96217E+05	6.30716E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	48	1.58253E+05	1.20608E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	49	3.44849E+03	5.91392E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	[illegible]1	50	1.03147E+02	1.92273E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	3.48315E+02	8.19381E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TOTAL (CURIES/CC)				8.62786E-07	2.27706E-12	7.25363E-13	6.49624E-13	6.48976E-13	6.48364E-13	6.46533E-13	6.44103E-13
TOTAL (CURIES)				6.27936E+00	1.65725E-05	5.27919E-06	4.72796E-06	4.72325E-06	4.71879E-06	4.70546E-06	4.68778E-06

COMPONENT : TOP HEAD LINER - R5
VOLUME : 1.60000E+06 CC
: ABOVE VOLUME IS FOR THE PCRV LINER AND COOLING TUBES
: ON THE TOP HEAD OF THE PCRV.
:
: (INTERVAL 45 TOTGUPRS)

NUCLIDE SYM	Z	N	HALF-LIFE (SECONDS)	CONCENTRATION (CURIES/CC) AT TIME SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
AL	13	28	1.38629E+02	1.70419E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SI	14	31	9.43057E+03	2.35134E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	4.89527E-09	4.20507E-32	1.76375E-47	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	3.48315E+02	3.31805E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	49	2.85246E+07	3.36914E-13	3.37601E-14	7.28327E-15	1.57448E-16	7.35782E-20	3.43849E-23	3.50920E-33	1.67366E-46
V	23	52	2.02084E+02	3.24349E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	53	1.19922E+02	5.85703E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	54	5.50117E+01	6.38470E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39843E+06	1.95544E-06	2.56308E-18	3.06975E-26	4.81926E-46	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	3.26343E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	3.16483E-16	3.16483E-16	3.16483E-16	3.16483E-16	3.16482E-16	3.16482E-16	3.16480E-16	3.16478E-16
MN	25	54	2.61565E+07	5.36019E-07	4.36123E-08	8.18897E-09	1.25107E-10	2.92000E-14	6.81515E-18	8.66504E-29	2.57137E-43
MN	25	56	9.29152E+03	1.59237E-04	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	7.04722E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	7.70170E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	1.40119E-05	6.29605E-05	3.69359E-05	9.73646E-06	6.76555E-07	4.70117E-08	1.57730E-11	3.67729E-16
FE	26	59	3.89409E+06	3.18037E-06	1.52707E-13	2.01730E-18	1.27961E-30	5.14822E-55	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	60	3.15569E+12	1.01336E-20	1.01333E-20	1.01332E-20	1.01328E-20	1.01321E-20	1.01314E-20	1.01293E-20	1.01265E-20
FE	26	61	3.60001E+02	1.26107E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	57	2.34838E+07	4.00327E-11	2.44815E-12	3.80004E-13	3.60714E-15	3.25020E-19	2.92857E-23	2.14238E-35	1.41215E-51
CO	27	58	6.13405E+06	2.24945E-08	[illegible]	4.06061E-16	7.33004E-24	2.38849E-39	7.78289E-55	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	3.72142E-06	2.50616E-06	1.92549E-06	9.96268E-07	2.66712E-07	7.14018E-08	1.36997E-09	7.03683E-12
CO	27	61	5.94007E+03	1.71408E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	62	8.34012E+02	1.14199E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	64	2.99999E-01	3.45070E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NI	28	59	2.52053E+12	1.46607E-10	1.46603E-10	1.46600E-10	1.46594E-10	1.46581E-10	1.46569E-10	1.46530E-10	1.46480E-10
NI	28	63	2.90020E+09	1.72152E-08	1.68300E-08	1.65781E-08	1.59645E-08	1.48047E-08	1.37292E-08	1.09491E-08	8.09759E-09
NI	28	65	9.21738E+03	9.83719E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CU	29	64	4.62098E+04	7.41938E-06	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	88	7.20602E+06	2.25937E-14	2.50641E-18	5.78667E-21	1.48211E-27	9.72211E-41	6.37736E-54	0.00000E+00	0.00000E+00
ZR	40	89	2.82249E+05	2.25372E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	93	4.74758E+13	1.64751E-18	1.64751E-18	1.64750E-18	1.64750E-18	1.64749E-18	1.64748E-18	1.64746E-18	[illegible]
ZR	40	95	5.63534E+06	5.08899E-13	4.46046E-18	1.89619E-21	7.06533E-30	9.80890E-47	1.36178E-63	0.00000E+00	0.00000E+00
ZR	40	97	6.04840E+04	7.06327E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	91	2.20888E+10	7.32719E-16	7.30546E-16	7.29100E-16	7.25499E-16	7.18350E-16	7.11271E-16	6.90451E-16	6.63637E-16
NB	41	92	8.80746E+05	1.47545E-11	6.46752E-44	1.73225E-65	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	94	6.30134E+11	2.18107E-16	2.18085E-16	2.18069E-16	2.18032E-16	2.17956E-16	2.17880E-16	2.17654E-16	2.17352E-16
NB	41	95	3.02684E+06	[illegible]	1.64345E-21	8.68421E-28	1.76275E-43	7.26216E-75	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	96	8.28132E+04	7.60549E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	97	4.33217E+03	7.45424E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	98	3.06025E+03	2.02109E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	100	3.09994E+00	1.32823E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	93	2.84077E+11	2.97722E-12	2.97653E-12	2.97607E-12	2.97493E-12	2.97264E-12	2.97035E-12	2.96349E-12	2.95438E-12
MO	42	99	2.41515E+05	2.38291E-07	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	101	8.76292E+02	1.65703E-07	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TOTAL (CURIES/CC)				3.16509E-04	6.55272E-05	3.88863E-05	1.07490E-05	9.58221E-07	1.32292E-07	1.24843E-08	8.25406E-09
TOTAL (CURIES)				5.06542E+02	1.04844E+02	6.22181E+01	1.71983E+01	1.53315E+00	2.11667E-01	1.99749E-02	1.32065E-02

COMPONENT : REGION CONSTRAINT DEVICE, PRIMARY BODY - REV 5
VOLUME : 8.41760E+05 CC
: ABOVE VOLUME IS THE TOTAL VOLUME OF THE RCD PRIMARY BODY
: FOR ALL THE DEVICES.
: 84 TOTAL AT 1.0021E+4 CC EACH.
: (INTERVAL 39 , UPRCDRS)

NUCLIDE SYM	Z	N	HALF-LIFE (SECONDS)	CONCENTRATION (CURIES/CC) AT TIME SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
AL	13	28	1.38629E+02	2.70830E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SI	14	31	9.43057E+03	4.50392E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	9.39083E-09	8.06680E-32	3.38350E-47	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	52	2.02084E+02	9.24294E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39843E+06	4.61659E-08	6.05116E-20	7.24735E-28	1.13778E-47	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	5.96144E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	5.64604E-16	5.64604E-16	5.64604E-16	5.64603E-16	5.64602E-16	5.64601E-16	5.64598E-16	5.64594E-16
MN	25	54	2.61565E+07	1.04055E-06	8.46629E-08	1.58969E-08	2.42864E-10	5.66849E-14	1.32300E-17	1.68211E-28	4.99169E-43
MN	25	56	9.29152E+03	2.52677E-04	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	1.34704E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	1.38461E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	1.75706E-04	7.89518E-05	4.63168E-05	1.22093E-05	8.48384E-07	5.89515E-08	1.97790E-11	4.61123E-16
FE	26	59	3.89409E+06	5.37722E-06	2.58189E-13	3.41076E-18	2.16350E-30	8.70436E-55	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	6.74098E-06	4.53966E-06	3.48784E-06	1.80464E-06	4.83123E-07	1.29337E-07	2.48156E-09	1.27465E-11
TOTAL (CURIES/CC)				4.41648E-04	8.35753E-05	4.98205E-05	1.40142E-05	1.33151E-06	1.88289E-07	2.50134E-09	1.27475E-11
TOTAL (CURIES)				3.71761E+02	7.03503E+01	4.19369E+01	1.17966E+01	1.12081E+00	1.58494E-01	2.10552E-03	1.07304E-05

COMPONENT : REGION CONSTRAINT DEVICE , LEGS ONLY - REV5
VOLUME : 1.05840E+05 CC
: ABOVE VOLUME IS THE TOTAL VOLUME OF THE RCD LEGS
: FOR ALL THE DEVICES.
: 84 TOTAL AT 1.26E+3 CC EACH.
: (INTERVALS 36-38 , UPRCORS)

NUCLIDE SYM	Z	M	HALF-LIFE (SECONDS)	CONCENTRATION (CURIES/CC) AT TIME SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
LI	3	8	8.40178E-01	5.17105E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	8	3.00064E-16	7.27597E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	10	7.88563E+13	2.68984E-16	2.68983E-16	2.68983E-16	2.68983E-16	2.68982E-16	2.68981E-16	2.68979E-16	2.68976E-16
B	5	12	1.99754E-02	2.68445E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AL	13	28	1.38629E+02	4.73294E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SI	14	31	9.43057E+03	2.73512E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	4.99402E-09	4.28990E-32	1.79933E-47	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CA	20	45	1.42623E+07	2.27259E-10	2.28186E-12	1.06203E-13	4.96310E-17	1.08388E-23	2.36706E-30	2.46547E-50	5.60804E-77
CA	20	47	3.91608E+05	1.06008E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	46	7.25049E+06	4.60007E-09	5.39619E-13	1.29311E-15	3.63511E-22	2.87249E-35	2.26983E-48	0.00000E+00	0.00000E+00
SC	21	47	2.96217E+05	5.91446E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	48	1.58253E+05	1.05069E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	49	3.44849E+03	5.46363E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	50	1.03147E+02	1.59114E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	3.48315E+02	2.17676E-07	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	49	2.85246E+07	5.67292E-11	5.68448E-12	1.22635E-12	2.65108E-14	1.23890E-17	5.78968E-21	5.90875E-31	2.81809E-44
V	23	52	2.02084E+02	5.21527E-07	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	53	1.19922E+02	1.07992E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	54	5.50117E+01	1.07621E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39843E+06	4.73665E-04	6.20853E-16	7.43582E-24	1.16736E-43	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	2.35317E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	1.66652E-16	1.66652E-16	1.66652E-16	1.66652E-16	1.66651E-16	1.66651E-16	1.66650E-16	1.66649E-16
MN	25	54	2.61565E+07	3.21667E-07	2.61719E-08	4.91423E-09	7.50769E-11	1.75231E-14	4.08979E-18	5.19992E-29	1.54309E-43
MN	25	56	9.29152E+03	1.46959E-04	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	4.11855E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	4.10037E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	1.13336E-04	5.09260E-05	2.98759E-05	7.87540E-06	5.47236E-07	[illegible]	1.27581E-11	2.97440E-16
FE	26	59	3.89409E+06	2.40216E-06	1.15340E-13	1.52368E-18	9.66499E-31	3.88849E-55	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	60	3.15569E+12	4.72020E-18	4.72010E-18	4.72004E-18	4.71988E-18	4.71955E-18	4.71922E-18	4.71824E-18	4.71693E-18
FE	26	61	3.60001E+02	5.86474E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	57	2.34838E+07	1.86319E-08	1.13942E-09	1.76861E-10	1.67883E-12	1.51270E-16	1.36301E-20	9.97101E-33	6.57241E-49
CO	27	58	6.13405E+06	1.19696E-05	2.70387E-10	2.16070E-13	3.90041E-21	1.27095E-36	4.14138E-52	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	6.32846E-04	4.26165E-04	3.27440E-04	1.69420E-04	4.53558E-05	1.21422E-05	2.32979E-07	1.19665E-09
CO	27	61	5.94007E+03	8.95895E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	62	8.34012E+02	2.06276E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	64	2.99999E-01	1.60482E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NI	28	59	2.52053E+12	1.02778E-07	1.02776E-07	1.02774E-07	1.02769E-07	1.02760E-07	1.02751E-07	1.02725E-07	1.02689E-07
NI	28	63	2.90020E+09	1.22395E-05	1.19656E-05	1.17865E-05	1.13503E-05	1.05257E-05	9.76102E-06	7.78445E-06	5.75712E-06
NI	28	65	9.21738E+03	2.17844E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CU	29	64	4.62098E+04	2.10402E-05	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	89	1.56998E+01	2.11592E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	90	2.30281E+05	1.31594E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	93	4.74758E+13	1.71453E-14	1.71452E-14	1.71452E-14	1.71452E-14	1.71451E-14	1.71450E-14	1.71448E-14	1.71445E-14
NB	41	92	8.80746E+05	6.17247E-09	2.70566E-41	7.24678E-63	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	94	6.30134E+11	4.68709E-08	4.68660E-08	4.68628E-08	4.68546E-08	4.68384E-08	4.68221E-08	4.67734E-08	4.67085E-08
TOTAL (CURIES/CC)				1.41579E-03	4.89234E-04	3.69257E-04	1.88796E-04	5.65783E-05	2.20908E-05	8.16693E-06	5.90772E-06
TOTAL (CURIES)				1.49848E+02	5.17826E+01	3.90821E+01	1.99821E+01	5.98824E+00	2.33809E+00	8.64388E-01	6.25273E-01

COMPONENT : BORONATED BOTTOM REFLECTORS WITH HASTELLOY-X CANS - R5
VOLUME : 8.28520E+04 CC
: ABOVE VOLUME IS FOR THE TOTAL NUMBER OF HASTELLOY-X CANS ONLY.
: ONE CAN = 4.13 CC. BOTTOM NCR ELEMENTS, 208 ELE W/72 CANS.
: CR ELE, 37 W/9 CANS. BOTT NCR SIDE ELE, 66 ELE W/72 CANS.
: (INTERVALS 25-32 HASTXMRS)

NUCLIDE SYM	Z	M	HALF-LIFE (SECONDS)	CONCENTRATION (CURIES/CC) AT TIME SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
NA	11	24	5.41521E+04	8.05154E-07	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MG	12	27	5.68153E+02	3.48970E-06	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AL	13	28	1.38629E+02	1.77308E-03	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	3.48315E+02	1.80751E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	49	2.85246E+07	1.76938E-09	1.77299E-10	3.82497E-11	8.26871E-13	3.86412E-16	1.80580E-19	1.84294E-29	8.78961E-43
V	23	52	2.02084E+02	2.50451E-05	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	53	1.19922E+02	4.22507E-07	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	54	5.50117E+01	3.35918E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39843E+06	3.40815E-02	4.46721E-14	5.35028E-22	8.39951E-42	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	1.59785E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	3.32047E-15	3.32047E-15	3.32047E-15	3.32047E-15	3.32046E-15	3.32046E-15	3.32044E-15	3.32041E-15
MN	25	54	2.61565E+07	1.07443E-05	8.74197E-07	1.64145E-07	2.50773E-09	5.85306E-13	1.36608E-16	1.73688E-27	5.15423E-42
MN	25	56	9.29152E+03	3.91240E-06	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	1.10717E-07	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	8.23399E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	8.08349E-03	3.63220E-03	2.13084E-03	5.61698E-04	3.90306E-05	2.71211E-06	9.09947E-10	2.12143E-14
FE	26	59	3.89409E+06	1.27555E-04	6.12461E-12	8.09081E-17	5.13214E-29	2.06480E-53	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	60	3.15569E+12	1.21110E-16	1.21108E-16	1.21106E-16	1.21102E-16	1.21093E-16	1.21085E-16	1.21060E-16	1.21026E-16
FE	26	61	3.60001E+02	1.50313E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	57	2.34838E+07	4.77787E-07	2.92185E-08	4.53532E-09	4.30510E-11	3.87909E-15	3.49522E-19	2.55691E-31	1.68539E-47
CO	27	58	6.13405E+06	5.29770E-04	1.19672E-08	9.56319E-12	1.72631E-19	5.62517E-35	1.83296E-50	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	6.10702E-02	4.11272E-02	3.15982E-02	1.63492E-02	4.37687E-03	1.17174E-03	2.24817E-05	1.15478E-07
CO	27	61	5.94007E+03	3.36082E-07	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	62	8.34012E+02	4.80711E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	64	2.99999E-01	4.11323E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NI	28	59	2.52053E+12	8.11160E-06	8.11139E-06	8.11125E-06	8.11090E-06	8.11019E-06	8.10949E-06	8.10738E-06	8.10456E-06
NI	28	63	2.90020E+09	1.09070E-03	1.06630E-03	1.05034E-03	1.01146E-03	9.37982E-04	8.69839E-04	6.93701E-04	5.13038E-04
ZR	40	88	7.20602E+06	2.17793E-10	2.41607E-14	5.57809E-17	1.42869E-23	9.37167E-37	6.14748E-50	0.00000E+00	0.00000E+00
ZR	40	89	2.82249E+05	1.92713E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	93	4.74758E+13	1.46019E-14	1.46019E-14	1.46019E-14	1.46019E-14	1.46018E-14	1.46017E-14	1.46015E-14	1.46013E-14
ZR	40	95	5.63534E+06	4.20100E-09	3.68214E-14	1.56532E-17	5.83248E-26	8.09731E-43	1.12416E-59	0.00000E+00	0.00000E+00
ZR	40	97	6.04840E+04	5.54480E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	91	2.20868E+10	5.12420E-12	5.10900E-12	5.09889E-12	5.07371E-12	5.02371E-12	4.97421E-12	4.82860E-12	4.64108E-12
NB	41	92	8.80746E+05	1.45513E-07	6.37848E-40	1.78840E-61	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	94	6.30134E+11	1.93358E-12	1.93338E-12	1.93325E-12	1.93291E-12	1.93224E-12	1.93157E-12	1.92956E-12	1.92688E-12
NB	41	95	3.02684E+06	4.08326E-08	1.56846E-17	8.28796E-24	1.68232E-39	6.93079E-71	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	96	8.28132E+04	6.16916E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	97	4.33217E+03	6.64838E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	98	3.06025E+03	1.45299E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	100	3.09994E+00	9.09033E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	93	2.84077E+11	3.83359E-08	3.83270E-08	3.83211E-08	3.83064E-08	3.82769E-08	3.82474E-08	3.81592E-08	3.80418E-08
MO	42	99	2.41515E+05	3.68841E-03	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	101	8.76292E+02	1.67898E-03	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	178	9.78261E+08	1.19776E-12	1.12005E-12	1.07107E-12	9.57774E-13	[illegible]	6.12414E-13	3.13126E-13	1.28022E-13
HF	72	179	1.89384E+10	6.26334E-14	6.24168E-14	6.22727E-14	6.19142E-14	6.12032E-14	6.05003E-14	5.84399E-14	5.58014E-14
HF	72	180	1.98723E+04	[illegible]	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	182	2.84077E+14	5.20216E-19	5.20216E-19	5.20216E-19	5.20216E-19	5.20215E-19	5.20215E-19	5.20214E-19	5.20212E-19
W	74	181	1.20968E+07	7.52439E-08	3.31537E-10	8.91056E-12	1.05523E-15	1.47984E-23	2.07531E-31	5.72383E-55	0.00000E+00
W	74	185	6.47801E+06	6.94599E-04	2.76908E-08	3.23149E-11	1.50344E-18	3.25399E-33	7.04295E-48	0.00000E+00	0.00000E+00
W	74	187	8.59984E+04	1.27966E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00

TOTAL (CURIES/CC)	1.25668E-01	4.58348E-02	3.47877E-02	1.79305E-02	5.36202E-03	2.05243E-03	7.24328E-04	5.21296E-04
TOTAL (CURIES)	1.04119E+04	3.79750E+03	2.88223E+03	1.48558E+03	4.44254E+02	1.70048E+02	6.00121E+01	4.31904E+01

COMPONENT : BORONATED BOTTOM REFLECTORS WITH HAST-X CANS, GRAPHITE ONLY - R5
VOLUME : 1.52620E+07 CC
: ABOVE VOLUME IS FOR THE TOTAL NUMBER OF HAST-X CANS,GRAPHITE ONLY,
: WITH THE CI/CC ACTIVITY FROM REBATE BEING FOR ONE HOMOGENIZED
: BLOCX OF GRAPHITE + METAL. THE TOAL VOLUME THEREFORE BECOMES
: (INTERVALS 25-32 HASTXGRS) (307)(4.497+4)=1.5262+7

NUCLIDE SYM	Z	M	HALF-LIFE (SECONDS)	CONCENTRATION (CURIES/CC) AT TIME SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
H	1	3	3.87233E+08	1.07485E-07	9.07299E-08	8.10374E-08	6.10975E-08	3.47295E-08	1.97412E-08	3.62577E-09	3.78531E-10
HE	2	6	8.09751E-01	2.21102E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
LI	3	8	8.40178E-01	2.85358E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	8	3.00064E-16	2.09002E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	10	7.88563E+13	9.12325E-17	9.12324E-17	9.12324E-17	9.12323E-17	9.12320E-17	9.12318E-17	9.12310E-17	9.12300E-17
B	5	12	1.99754E-02	1.31012E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AL	13	28	1.38629E+02	2.56846E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	7.64482E-10	6.56696E-33	2.75441E-48	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CA	20	45	1.42623E+07	6.71199E-13	6.73938E-15	3.13665E-16	1.46583E-19	3.20119E-26	6.99102E-33	7.28165E-53	0.00000E+00
CA	20	47	3.91608E+05	3.09771E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	46	7.25049E+06	1.95118E-11	2.28887E-15	5.48490E-18	1.54188E-24	1.21841E-37	9.62779E-51	0.00000E+00	0.00000E+00
SC	21	47	2.96217E+05	3.08022E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	48	1.58253E+05	6.05321E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	49	3.44849E+03	2.39351E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	50	1.03147E+02	4.65448E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	3.48315E+02	1.96674E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	49	2.85246E+07	7.70399E-15	7.71970E-16	1.66542E-16	3.60025E-18	1.68246E-21	7.86256E-25	8.02426E-35	3.82705E-48
V	23	52	2.02084E+02	1.15321E-06	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39343E+06	4.20962E-12	5.51773E-24	6.60846E-32	1.03748E-51	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	1.48160E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	3.07890E-20	3.07889E-20	3.07889E-20	3.07889E-20	3.07888E-20	3.07888E-20	3.07886E-20	3.07884E-20
MN	25	54	2.61565E+07	9.96264E-11	8.10595E-12	1.52203E-12	2.32528E-14	5.42723E-18	1.26669E-21	1.61052E-32	4.77924E-47
MN	25	56	9.29152E+03	3.57589E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	1.02662E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	7.63494E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	7.48691E-08	3.36414E-08	1.97358E-08	5.20243E-09	3.61500E-10	2.51195E-11	8.42790E-15	1.96487E-19
FE	26	59	3.89409E+06	1.17502E-09	5.64192E-17	7.45315E-22	4.72766E-34	1.90207E-58	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	5.95188E-10	4.00824E-10	3.07955E-10	1.59339E-10	4.26568E-11	1.14197E-11	2.19106E-13	1.12544E-15
			TOTAL (CURIES/CC)	1.34463E-06	1.24780E-07	1.01083E-07	6.64592E-08	3.51337E-08	1.97778E-08	3.62600E-09	3.78532E-10
			TOTAL (CURIES)	2.05218E+01	1.90439E+00	1.54272E+00	1.01430E+00	5.36210E-01	3.01848E-01	5.53400E-02	5.77715E-03

COMPONENT : CONCRETE - RADIAL FIRST 6 INCHES - R5
VOLUME : 4.90000E+07 CC
: ABOVE VOLUME IS FOR THE FIRST 6 INCHES OF CONCRETE
: IN THE RADIAL DIRECTION.
:
: (INTERVALS 61-63 TOTGRDRS)

NUCLIDE SYM	Z	N	HALF-LIFE (SECONDS)	CONCENTRATION (CURIES/CC) AT TIME SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
H	1	3	3.87233E+08	6.18132E-09	5.21776E-09	4.66036E-09	3.51364E-09	1.99725E-09	1.13529E-09	2.08513E-10	2.17688E-11
HE	2	6	8.09751E-01	9.23546E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
LI	3	8	8.40178E-01	1.63496E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	8	3.00064E-16	2.60300E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	10	7.88563E+13	1.32259E-19	1.32259E-19	1.32258E-19	1.32258E-19	1.32258E-19	1.32258E-19	1.32256E-19	1.32255E-19
B	5	12	1.99754E-02	2.26719E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
C	6	14	1.80978E+11	3.03075E-12	3.02965E-12	3.02892E-12	3.02709E-12	3.02344E-12	3.01978E-12	3.00885E-12	2.99434E-12
F	9	20	1.19023E+01	1.00416E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NE	10	23	3.76710E+01	1.42537E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NA	11	24	5.41521E+04	3.13560E-07	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MG	12	27	5.68153E+02	7.24425E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AL	13	28	1.38629E+02	3.44192E-07	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SI	14	31	9.43057E+03	2.79142E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	1.00603E-10	8.64190E-34	3.62472E-49	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
S	16	35	7.60030E+06	3.91579E-10	6.96710E-14	2.20398E-16	1.24053E-22	3.92988E-35	1.24495E-47	0.00000E+00	0.00000E+00
S	16	37	3.04012E+02	6.59890E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CL	17	36	9.77641E+12	2.95218E-13	2.95216E-13	2.95215E-13	2.95212E-13	2.95205E-13	2.95198E-13	2.95178E-13	2.95152E-13
AR	18	37	3.02684E+06	2.88556E-09	1.10840E-18	5.85695E-25	1.18886E-40	4.89786E-72	0.00000E+00	0.00000E+00	0.00000E+00
AR	18	39	8.48405E+09	5.13179E-11	5.09225E-11	5.06606E-11	5.00117E-11	4.87388E-11	4.74982E-11	4.39628E-11	3.96549E-11
AR	18	41	6.60140E+03	3.44732E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
K	19	40	4.10146E+16	3.99065E-16	3.99065E-16	3.99065E-16	3.99065E-16	3.99065E-16	3.99065E-16	3.99065E-16	3.99065E-16
K	19	42	4.67192E+04	1.10105E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CA	20	41	2.52053E+12	8.27303E-11	8.27282E-11	8.27267E-11	8.27231E-11	8.27160E-11	8.27088E-11	8.26872E-11	8.26585E-11
CA	20	45	1.42623E+07	3.36663E-08	3.38037E-10	1.57329E-11	7.35238E-15	1.60567E-21	3.50659E-28	3.65236E-48	8.30780E-75
CA	20	47	3.91608E+05	1.64907E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	46	7.25049E+06	4.49404E-09	5.27181E-13	1.26330E-15	3.55133E-22	2.80628E-35	2.21751E-48	0.00000E+00	0.00000E+00
SC	21	47	2.96217E+05	5.98794E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	48	1.58253E+05	1.43669E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	49	3.44849E+03	6.02797E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	50	1.03147E+02	2.45032E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	3.48315E+02	4.84379E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	49	2.85246E+07	4.10570E-16	4.11407E-17	8.87554E-18	1.91869E-19	8.96638E-23	4.19021E-26	4.27638E-36	2.03956E-49
V	23	52	2.02084E+02	1.27266E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	53	1.19922E+02	3.55010E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	54	5.50117E+01	4.37220E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39843E+06	2.05734E-09	2.69665E-21	3.22972E-29	5.07040E-49	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	3.24363E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	3.06236E-19	3.06235E-19	3.06235E-19	3.06235E-19	3.06234E-19	3.06234E-19	3.06232E-19	3.06230E-19
MN	25	54	2.61565E+07	4.00716E-10	3.26036E-11	6.12190E-12	9.35270E-14	2.18293E-17	5.09486E-21	6.47760E-32	1.92230E-46
MN	25	56	9.29152E+03	3.07376E-06	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	5.83697E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	7.38046E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	3.60275E-07	1.61884E-07	9.49697E-08	2.50344E-08	1.73956E-09	1.20877E-10	4.05556E-14	9.45505E-19
FE	26	59	3.89409E+06	4.76340E-09	2.28716E-16	3.02141E-21	1.91653E-33	7.71075E-58	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	60	3.15569E+12	7.17338E-25	7.17323E-25	7.17313E-25	7.17289E-25	7.17239E-25	7.17189E-25	7.17040E-25	7.16841E-25
FE	26	61	3.60007E+02	8.93923E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	57	2.34838E+07	2.83587E-15	1.73426E-16	2.69190E-17	2.55526E-19	2.30240E-23	2.07456E-27	1.51763E-39	1.00035E-55
CO	27	58	6.13405E+06	1.21356E-12	2.74125E-17	2.19057E-20	3.95433E-28	1.28852E-43	4.19863E-59	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	9.38973E-09	6.32343E-09	4.85832E-09	2.51374E-09	6.72957E-10	1.80158E-10	3.45664E-12	1.77550E-14
CO	27	61	5.94007E+03	1.00125E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	62	8.34012E+02	4.50467E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	64	2.99999E-01	2.44600E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NI	28	59	2.52053E+12	2.28637E-14	2.28631E-14	2.28627E-14	2.28617E-14	2.28597E-14	2.28577E-14	2.28517E-14	2.28438E-14
NI	28	63	2.90020E+09	3.22931E-12	3.15706E-12	3.10979E-12	2.99470E-12	2.77714E-12	2.57539E-12	2.05386E-12	1.51898E-12
NI	28	65	9.21738E+03	3.50438E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CU	29	64	4.62098E+04	6.04308E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RB	37	86	1.60972E+06	5.12525E-16	1.01210E-33	1.59305E-45	4.9510[illegible]E-75	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	87	1.00799E+04	2.93777E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	89	4.50096E+06	1.86726E-14	8.69679E-21	5.22555E-25	1.46[illegible]E-35	1.14529E-56	8.96927E-78	0.00000E+00	0.00000E+00
SR	38	90	8.86377E+08	4.44618E-19	4.12890E-19	3.93006E-19	3.[illegible]385E-19	2.71416E-19	2.12061E-19	1.01143E-19	3.76906E-20
SR	38	91	3.48315E+04	3.92752E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	92	9.75604E+03	1.80640E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	93	4.50095E+02	9.17660E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	89	1.56998E+01	3.50459E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	90	2.30281E+05	5.69467E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	91	5.09667E+06	4.75094E-15	1.21625E-20	2.27608E-24	1.09043E-33	2.50265E-52	5.74387E-71	0.00000E+00	0.00000E+00
Y	39	92	1.27440E+04	1.41579E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	94	1.12200E+03	2.98184E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	96	9.80406E+00	2.69801E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	88	7.20602E+06	7.48258E-18	8.30073E-22	1.91643E-24	4.90845E-31	3.21977E-44	2.11206E-57	0.00000E+00	0.00000E+00
ZR	40	89	2.82249E+05	7.86879E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	93	4.74758E+13	1.26772E-16	1.26772E-16	1.26772E-16	1.26772E-16	1.26771E-16	1.26771E-16	1.26769E-16	1.26766E-16
ZR	40	95	5.63534E+06	6.12648E-14	5.36981E-19	2.28277E-22	8.50573E-31	1.18086E-47	1.63941E-64	0.00000E+00	0.00000E+00
ZR	40	97	6.04840E+04	2.93740E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	91	2.20238E+10	2.74600E-19	2.73785E-19	2.73243E-19	2.71894E-19	2.69214E-19	2.66562E-19	2.58759E-19	2.48710E-19
NB	41	92	8.80746E+05	1.14725E-14	5.02888E-47	1.34692E-68	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	94	6.30134E+11	2.54966E-14	2.54939E-14	2.54922E-14	2.54877E-14	2.54789E-14	2.54701E-14	2.54435E-14	2.54082E-14
NB	41	95	3.02684E+06	1.43703E-15	5.51990E-25	2.91680E-31	5.92062E-47	2.43917E-78	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	96	8.28132E+04	2.70014E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	97	4.33217E+03	2.56483E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	98	3.06025E+03	7.47213E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	100	3.09994E+00	5.03448E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	93	2.84077E+11	4.31999E-16	4.31899E-16	4.31833E-16	4.31667E-16	4.31334E-16	4.31002E-16	4.3[illegible]008E-16	4.28685E-16
MO	42	99	2.41515E+05	4.04362E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	101	8.76292E+02	1.86137E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	104	2.61565E+02	5.87357E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	106	7.84813E+03	3.27746E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PD	46	107	2.05134E+14	1.24766E-23	1.24766E-23	1.24766E-23	1.24766E-23	1.24766E-23	1.24766E-23	1.24765E-23	1.24765E-23
PD	46	109	4.53704E+04	3.29098E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	106	7.34422E+05	1.27642E-16	1.99912E-55	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	108	4.10389E+09	2.02397E-12	1.99186E-12	1.97074E-12	1.91891E-12	1.81931E-12	1.72488E-12	1.46999E-12	1.18774E-12
AG	47	110	2.15826E+07	4.45214E-10	2.12859E-11	2.80397E-12	1.76596E-14	7.00473E-19	2.77843E-23	1.73392E-36	4.29202E-54
CD	48	109	3.99508E+07	2.71461E-17	5.25220E-18	1.75701E-18	1.13721E-19	4.76401E-22	1.99576E-24	1.46724E-31	4.51889E-41
CD	48	111	2.92221E+03	6.61229E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	115	1.92541E+05	1.95793E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	117	1.22399E+04	5.80017E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	119	5.97541E+02	3.25361E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	111	2.42444E+05	9.13048E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	112	1.25400E+03	5.48904E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	114	4.27869E+06	9.42168E-18	2.05758E-24	7.46185E-29	5.90978E-40	3.70677E-62	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	115	1.61497E+04	1.09473E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	116	1.40998E+01	4.73686E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	117	6.95931E+03	6.97948E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	118	2.63955E+02	2.39957E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	119	1.26027E+02	2.56918E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	120	4.40093E+01	5.20035E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	122	1.00998E+01	7.10814E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	113	9.94473E+06	6.38755E-13	8.70079E-16	1.06916E-17	1.78961E-22	5.01380E-32	1.40470E-41	3.08907E-70	0.00000E+00
SN	50	121	9.72156E+04	1.50890E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	123	1.07967E+07	1.93492E-12	4.43634E-15	7.71375E-17	3.07524E-21	4.88744E-30	7.76755E-39	3.11817E-65	0.00000E+00
SN	50	125	8.12599E+05	2.71148E-11	2.29816E-46	9.55305E-70	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00

I	53	130	4.64981E+04	2.41768E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
XE	54	133	4.56018E+05	1.17996E-15	3.76469E-78	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	132	5.58990E+05	1.01183E-14	1.05061E-65	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	134	6.47801E+07	1.25452E-09	4.55553E-10	2.31871E-10	4.28562E-11	1.46402E-12	5.00128E-14	1.99383E-18	2.71533E-24
EU	63	152	4.17559E+08	7.42594E-09	6.34598E-09	5.71475E-09	4.39788E-09	2.60457E-09	1.54251E-09	3.21409E-10	3.94161E-11
EU	63	154	2.69812E+08	8.36280E-10	6.55730E-10	5.57580E-10	3.71760E-10	1.65262E-10	7.34658E-11	6.45384E-12	2.52036E-13
LU	71	174	1.22687E+07	5.80596E-21	2.76027E-23	7.80433E-25	1.04906E-28	1.89551E-36	3.42489E-44	2.02028E-67	0.00000E+00
LU	71	177	1.38242E+07	2.22590E-18	1.93177E-20	8.15811E-22	2.99004E-25	4.01647E-32	5.39523E-39	1.30772E-59	0.00000E+00
HF	72	173	8.49653E+04	4.71461E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	175	6.04840E+06	5.15449E-11	1.00070E-15	7.22860E-19	1.01375E-26	1.99369E-62	3.92092E-58	0.00000E+00	0.00000E+00
HF	72	178	9.78261E+08	1.92735E-19	1.80230E-19	1.72348E-19	1.54117E-19	1.23237E-19	9.85448E-20	5.03857E-20	2.06002E-20
HF	72	179	1.89384E+10	9.33552E-21	9.30323E-21	9.28176E-21	9.22831E-21	9.12234E-21	9.01758E-21	8.71047E-21	8.31720E-21
HF	72	18[illegible]	1.98723E+04	1.94534E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	181	3.66357E+06	4.67744E-10	7.77829E-18	5.06762E-23	5.49052E-36	6.44455E-62	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	182	2.84077E+14	9.42916E-26	9.42913E-26	9.42913E-26	9.42913E-26	9.42912E-26	9.42911E-26	9.42909E-26	9.42906E-26
TA	73	180	2.93458E+04	2.20779E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TA	73	182	9.89362E+06	9.36938E-10	1.22558E-12	1.47216E-14	2.32810E-19	5.82194E-29	1.45591E-38	2.27689E-67	0.00000E+00
W	74	181	1.20968E+07	1.63511E-14	7.20457E-17	1.93634E-18	2.29310E-22	3.21581E-30	4.50982E-38	1.24384E-61	0.00000E+00
W	74	185	6.47801E+06	3.63155E-11	1.44775E-15	1.68951E-18	7.86037E-26	1.70128E-40	3.68225E-55	0.00000E+00	0.00000E+00
W	74	187	8.59984E+04	7.27117E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	203	4.02525E+06	6.56616E-17	5.45963E-24	1.04006E-28	1.64749E-40	4.13341E-64	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	20[illegible]	3.[illegible]1947E+02	4.94050E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	204	1.19282E+08	6.86016E-19	3.95740E-19	2.74238E-19	1.09628E-19	1.75189E-20	2.79957E-21	1.14248E-23	7.45058E-27
TL	81	206	2.52054E+02	1.17122E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	207	2.86188E+02	9.72527E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	203	1.86782E+05	2.45373E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	205	4.76390E+14	1.12023E-19	1.12023E-19	1.12023E-19	1.12023E-19	1.12023E-19	1.12023E-19	1.12022E-19	1.12022E-19
PB	82	207	7.95989E-01	2.45411E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TOTAL (CURIES/CC)				4.20087E-06	1.81418E-07	1.11159E-07	3.60154E-08	7.32047E-09	3.19022E-09	6.72399E-10	1.89813E-10
TOTAL (CURIES)				2.05843E+02	8.88958E+00	5.44678E+00	1.76475E+00	3.58703E-01	1.56321E-01	3.29475E-02	9.30086E-03

COMPONENT : CONCRETE - RADIAL SECOND 6 INCHES - RS
VOLUME : 5.06000E+07 CC
: ABOVE VOLUME I[illegible] FOR THE SECOND 6 INCHES OF CONCRETE
: IN THE RADIAL DIRECTION.
:
: (INTERVALS 64-66 TOTGRDRS)

NUCLIDE			HALF-LIFE			CONCENTRATION (CURIES/CC) AT TIME					
SYM	Z	M	(SECONDS)	SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
H	1	3	3.87233E+08	2.08714E-09	1.76179E-09	1.57358E-09	1.18639E-09	6.74375E-10	3.83334E-10	7.04049E-11	7.35028E-12
HE	2	6	8.09751E-01	2.04669E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
LI	3	8	8.40178E-01	5.51745E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	8	3.00064E-16	5.45482E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	10	7.88563E+13	3.40290E-20	3.40290E-20	3.40290E-20	3.40289E-20	3.40288E-20	3.40287E-20	3.40285E-20	3.40281E-20
B	5	12	1.99754E-02	7.61523E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
C	6	14	1.80978E+11	1.02100E-12	1.02063E-12	1.02038E-12	1.01977E-12	1.01853E-12	1.01730E-12	1.01362E-12	1.00873E-12
F	9	20	1.10023E+01	2.45435E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NE	10	23	3.76710E+01	3.33630E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NA	11	24	5.41521E+04	1.04362E-07	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MG	12	27	5.68153E+02	1.67043E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AL	13	28	1.38629E+02	1.14424E-07	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SI	14	31	9.43057E+03	6.20325E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	2.24068E-11	1.92476E-34	6.07313E-50	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
S	16	35	7.60030E+06	1.33677E-10	2.37042E-14	7.52392E-17	6.23489E-23	1.34158E-35	4.25000E-48	0.00000E+00	0.00000E+00
S	16	37	3.04012E+02	1.55168E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CL	17	36	9.77641E+12	9.70469E-14	9.70462E-14	9.70458E-14	9.70447E-14	9.70425E-14	9.70404E-14	9.70339E-14	9.70252E-14
AR	18	37	3.02684E+06	6.69894E-10	2.53862E-19	1.34144E-25	2.72291E-41	1.12178E-72	0.00000E+00	0.00000E+00	0.00000E+00
AR	18	39	8.48405E+09	1.67011E-11	1.65724E-11	1.64872E-11	1.62760E-11	1.58617E-11	1.54580E-11	1.43074E-11	1.29054E-11
AR	18	41	6.60140E+03	7.97032E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
K	19	40	4.10146E+16	1.33565E-16	1.33565E-16	1.33565E-16	1.33565E-16	1.33565E-16	1.33565E-16	1.33565E-16	1.33565E-16
K	19	42	4.47192E+04	3.60669E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CA	20	41	2.52053E+12	2.84340E-11	2.84335E-11	2.84328E-11	2.84316E-11	2.84291E-11	2.84266E-11	2.84192E-11	2.84094E-11
CA	20	45	1.42623E+07	1.10790E-08	1.11242E-10	5.17743E-12	2.41954E-15	5.28396E-22	1.15396E-28	1.20193E-48	2.73395E-75
CA	20	47	3.91608E+05	5.66690E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	46	7.25049E+06	1.47309E-09	1.72804E-13	4.14096E-16	1.16408E-22	9.19866E-36	7.26873E-49	0.00000E+00	0.00000E+00
SC	21	47	2.96217E+05	1.26083E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	48	1.58253E+05	3.46940E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	49	3.44449E+03	1.38437E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	50	1.[illegible]147E+02	6.10679E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	[illegible].48315E+02	1.61898E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	49	2.85246E+07	1.02428E-16	1.02637E-17	2.21426E-18	4.78671E-20	2.23692E-23	1.04537E-26	1.06687E-36	5.08826E-50
V	23	[illegible]	2.02084E+02	4.27961E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	[illegible]	53	1.19922E+02	8.39433E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	54	5.50117E+01	1.09018E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39843E+06	6.48279E-10	8.49726E-22	1.01770E-29	1.59771E-[illegible]9	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	7.48281E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	7.63990E-20	7.63990E-20	7.63989E-20	7.63989E-20	7.63987E-20	7.63986E-20	7.63981E-20	7.63976E-20
MN	25	54	2.61565E+07	9.00760E-11	7.32890E-12	1.37613E-12	2.10237E-14	4.90696E-18	1.14526E-21	1.45613E-32	4.32109E-47
MN	25	56	9.29152E+03	9.81972E-07	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	1.36622E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	1.83092E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	1.23465E-07	5.54772E-08	3.25458E-08	8.57921E-09	5.96142E-10	4.14240E-11	1.38983E-14	3.24022E-19
FE	26	59	3.89409E+06	1.50462E-09	7.22449E-17	9.54378E-22	6.05378E-34	2.43560E-58	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	60	3.15569E+12	1.78806E-25	1.78803E-25	1.78800E-25	1.78794E-25	1.78782E-25	1.78769E-25	1.78732E-25	1.78682E-25
FE	26	61	3.60001E+02	2.23001E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	57	2.34838E+07	7.07168E-16	4.32461E-17	6.71268E-18	6.37194E-20	5.74141E-24	5.17325E-28	3.78446E-40	2.49453E-56
CO	27	58	6.13405E+06	2.64916E-13	5.98431E-17	4.78214E-21	8.63253E-29	2.81291E-44	9.16586E-60	0.00000E+00	0.00000E+00
CO	27	60	1.65963E+08	2.06381E-09	1.92861E-09	1.48176E-09	7.66674E-10	2.05247E-10	5.49470E-11	1.05425E-12	5.41517E-15
CO	27	61	5.94007E+03	2.31558E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	62	[illegible].34012E+02	1.08801E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00

CO	27	64	2.99999E-01	6.10179E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NI	28	59	2.52053E+12	7.67493E-15	7.67473E-15	7.67460E-15	7.67426E-15	7.67360E-15	7.67293E-15	7.67293E-15	7.66827E-15
NI	28	63	2.90020E+09	1.09872E-12	1.07414E-12	1.05806E-12	1.01890E-12	9.44879E-13	8.76235E-13	6.98802E-13	5.16810E-13
NI	28	65	9.21738E+03	8.10201E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CU	29	64	4.62098E+04	1.96743E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RB	37	86	1.60972E+06	1.26636E-16	2.50072E-34	3.93614E-46	1.22352E-75	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	87	1.00799E+04	7.17004E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	89	4.50096E+06	4.39899E-15	2.04884E-21	1.23107E-25	3.44521E-36	2.69814E-57	2.11303E-78	0.00000E+00	0.00000E+00
SR	38	90	8.86377E+08	1.07439E-19	9.97720E-20	9.49672E-20	8.39433E-20	6.55859E-20	5.12431E-20	2.44405E-20	4.10768E-2[illegible]
SR	38	91	3.48315E+04	9.58225E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	92	9.75604E+03	4.48775E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	93	4.50095E+02	2.28571E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	89	1.56998E+01	8.71161E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	90	2.30281E+05	1.90904E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	91	5.09667E+06	1.13214E-15	2.89829E-21	5.42387E-25	2.59847E-34	5.96378E-53	1.36875E-71	0.00000E+00	0.00000E+00
Y	39	92	1.27440E+04	3.63109E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	[illegible]	1.12200E+03	7.36536E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	96	9.80406E+00	6.73045E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	88	7.20602E+06	1.75812E-18	1.95035E-22	4.50287E-25	1.15330E-31	7.56522E-45	4.96252E-58	0.00000E+00	0.00000E+00
ZR	40	89	2.82249E+05	1.89299E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	93	4.74758E+13	4.06054E-17	4.06053E-17	4.06053E-17	4.06052E-17	4.06050E-17	4.06048E-17	4.06042E-17	4.06035E-17
ZR	40	95	5.63534E+06	1.52763E-14	1.33896E-19	5.69206E-23	2.12090E-31	2.94447E-48	4.08765E-65	0.00000E+00	0.00000E+00
ZR	40	97	6.04840E+04	2.62924E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	4.	91	2.20888E+10	6.79967E-20	6.77950E-20	6.76608E-20	6.73267E-20	6.66632E-20	6.60963E-20	6.40742E-20	6.15858E-20
NB	41	92	8.80746E+05	2.79881E-15	1.22684E-47	3.28593E-69	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	94	6.30134E+11	5.58344E-15	5.58286E-15	5.58247E-15	5.58150E-15	5.57957E-15	5.57763E-15	5.57182E-15	5.56409E-15
NB	41	95	3.02684E+06	3.41334E-16	1.31113E-25	6.92820E-32	1.40631E-47	5.79369E-79	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	96	8.28132E+04	6.52968E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	97	4.33217E+03	6.14010E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	98	3.06025E+03	1.83600E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	100	3.09994E+00	1.25496E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	93	2.84077E+11	2.38203E-17	2.38148E-17	2.38111E-17	2.38019E-17	2.37836E-17	2.37653E-17	2.37105E-17	2.36375E-17
MO	42	99	2.41515E+05	4.78064E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	101	8.76292E+02	2.48271E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	104	2.61565E+02	1.43633E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	106	7.84813E+03	7.79673E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PD	46	107	2.05134E+14	2.98555E-24	2.98555E-24	2.98555E-24	2.98554E-24	2.98554E-24	2.98554E-24	2.98553E-24	2.98552E-24
PD	46	109	4.83704E+04	7.86081E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	106	7.34422E+05	3.10440E-17	4.98737E-56	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	108	4.10389E+09	5.74061E-13	5.64955E-13	5.58964E-13	5.44265E-13	5.16014E-13	4.89231E-13	4.16936E-13	3.36881E-13
AG	47	110	2.15826E+07	9.43883E-11	4.51275E-12	5.94460E-13	3.74395E-15	1.48505E-19	5.89045E-24	3.67603E-37	9.09936E-55
CD	48	109	3.99508E+07	6.47478E-18	1.25275E-18	4.19074E-19	2.71243E-20	1.13629E-22	4.76020E-25	3.49960E-32	1.07783E-41
CD	48	111	2.92221E+03	1.59611E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	115	1.92541E+05	4.83610E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	117	1.22399E+04	1.44697E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	119	5.97541E+02	8.11709E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	111	2.42444E+05	2.25648E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	112	1.25400E+03	1.31000E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	114	4.27869E+06	2.26731E-18	4.95154E-25	1.79569E-29	1.42218E-40	8.92029E-63	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	115	1.61497E+04	2.61444E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	116	1.40998E+01	1.15378E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	117	6.95931E+03	1.67267E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	118	2.63955E+02	5.91192E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	119	1.26027E+02	6.29051E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	120	4.40093E+01	1.29658E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	122	1.00998E+01	1.77333E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	113	9.94473E+06	3.50401E-14	4.77299E-17	5.86507E-19	9.81723E-24	2.75042E-33	7.70577E-43	1.69457E-71	0.00000E+00
SN	50	121	9.72156E+04	3.36460E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	123	1.07967E+07	4.74047E-13	1.08688E-15	1.88904E-17	7.53420E-22	1.19740E-30	1.90302E-39	7.63937E-66	0.00000E+00
SN	50	125	8.12599E+05	6.28499E-12	5.32681E-47	2.21432E-70	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
I	53	130	4.44981E+04	5.76393E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
XE	54	133	4.56018E+05	2.78044E-16	8.87182E-79	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	132	5.58990E+05	2.52430E-15	2.62185E-66	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	134	6.47801E+07	2.76129E-10	1.00271E-10	5.10346E-11	9.43296E-12	3.22242E-13	1.10082E-14	4.38856E-19	5.97665E-25
EU	63	152	4.17559E+08	2.53635E-09	2.16747E-09	1.95187E-09	1.50210E-09	8.89591E-10	5.26844E-10	1.09436E-10	1.34626E-11
EU	63	154	2.69812E+08	2.50756E-10	1.96619E-10	1.67189E-10	1.11471E-10	4.95534E-11	2.20285E-11	1.93516E-12	7.55722E-14
LU	71	174	1.22687E+07	1.32546E-21	6.30148E-24	1.78167E-25	2.39493E-29	4.32731E-37	7.81876E-45	4.61215E-68	0.00000E+00
LU	71	177	1.38242E+07	5.30868E-19	4.60719E-21	1.94567E-22	7.13112E-26	9.57910E-33	1.28674E-39	3.11885E-60	0.00000E+00
HF	72	173	8.49653E+04	1.17620E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	175	6.04840E+06	1.55441E-11	3.01777E-16	2.17989E-19	3.95710E-27	6.01229E-43	1.18241E-58	0.00000E+00	0.00000E+00
HF	72	178	9.78261E+08	4.64819E-20	4.34661E-20	4.15651E-20	3.71685E-20	2.97212E-20	2.37661E-20	1.21515E-20	4.96816E-21
HF	72	179	1.89384E+10	2.23752E-21	2.22970E-21	2.22464E-21	2.21183E-21	2.18643E-21	2.16132E-21	2.08771E-21	1.99345E-21
HF	72	180	1.98723E+04	4.70461E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	181	3.66357E+06	1.10185E-10	1.83231E-18	1.19377E-23	1.29339E-36	1.51813E-62	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	182	2.840[illegible]7E+14	2.29291E-26	2.29290E-26	2.29290E-26	2.29290E-26	2.29290E-26	2.29290E-26	2.29289E-26	2.29289E-26
TA	73	180	2.93458E+04	5.49764E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TA	73	182	9.89362E+06	1.68831E-10	2.22267E-13	2.66986E-15	4.22215E-20	1.05584E-29	2.64038E-39	4.12928E-68	0.00000E+00
W	74	181	1.20968E+07	4.07903E-15	1.79728E-17	4.83048E-19	5.72046E-25	8.02231E-31	1.12504E-38	3.10293E-62	0.00000E+00
W	74	185	6.47801E+06	7.66712E-12	3.05656E-16	3.56699E-19	1.65952E-26	3.59182E-41	7.77415E-56	0.00000E+00	0.00000E+00
W	74	187	8.59984E+04	1.58675E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	203	4.02525E+06	1.60157E-17	1.33167E-24	2.53685E-29	4.01843E-41	1.00819E-64	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	205	3.11947E+02	1.22174E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	204	1.19282E+08	1.65863E-19	9.56809E-20	6.63044E-20	2.65055E-20	4.23566E-21	6.76872E-22	2.76225E-24	1.80138E-27
TL	81	206	2.52054E+02	2.86654E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	207	2.86188E+02	2.36217E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	203	1.86782E+05	6.12134E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	205	4.76390E+14	2.79278E-20	2.79278E-20	2.79278E-20	2.79278E-20	2.79278E-20	2.79278E-20	2.79277E-20	2.79277E-20
PB	82	207	7.95989E-01	6.10326E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TOTAL (CURIES/CC)				1.35903E-06	6.18031E-08	3.78261E-06	1.22027E-08	2.46211E-09	1.07497E-09	2.27810E-10	6.41814E-11
TOTAL (CURIES)				6.87663E+01	3.12724E+00	1.91400E+00	6.57456E-01	1.24583E-01	5.43932E-02	1.15272E-02	3.24798E-03

COMPONENT : CONCRETE - RADIAL THIRD 6 INCHES - R5
VOLUME : 5.22000E+07 CC
: ABOVE VOLUME IS FOR THE THIRD 6 INCHES OF CONCRETE
: IN THE RADIAL DIRECTION.
:
: (INTERVALS 67-69 TOTGRDR5)

NUCLIDE SYM	Z	N	HALF-LIFE (SECONDS)	CONCENTRATION (CURIES/CC) AT TIME SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
H	1	3	3.87233E+08	2.35518E-10	1.96805E-10	1.77567E-10	1.33875E-10	7.60985E-11	4.32565E-11	7.94470E-12	8.29428E-13
HE	2	6	8.09751E-01	4.53360E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
LI	3	8	8.40176E-01	6.22637E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	8	3.00064E-16	1.19206E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	10	7.08563E+13	5.19598E-21	5.19598E-21	5.19598E-21	5.19597E-21	5.19595E-21	5.19594E-21	5.19590E-21	5.19584E-21
B	5	12	1.99754E-02	8.59112E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
C	6	14	1.80978E+11	1.15284E-13	1.15242E-13	1.15214E-13	1.15144E-13	1.15005E-13	1.14867E-13	1.14451E-13	1.13899E-13
F	9	20	1.10023E+01	5.92426E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NE	10	23	3.76710E+01	7.79058E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NA	11	24	5.41521E+04	1.17715E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MG	12	27	5.68153E+02	3.87948E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AL	13	28	1.38629E+02	1.31217E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SI	14	31	9.43057E+03	1.38616E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	5.01881E-12	4.31119E-35	1.80826E-50	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
S	16	35	7.60030E+06	1.51558E-11	2.69657E-15	6.53035E-18	4.80136E-24	1.52103E-36	4.81849E-49	0.00000E+00	0.00000E+00
S	16	37	3.04012E+02	3.63756E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CL	17	36	9.77641E+12	1.08901E-14	1.08900E-14	1.08900E-14	1.08898E-14	1.08896E-14	1.08894E-14	1.08886E-14	1.08876E-14
AR	18	37	3.02684E+06	1.51628E-10	5.82433E-20	3.07766E-26	6.24714E-42	2.57369E-73	0.00000E+00	0.00000E+00	0.00000E+00
AR	18	39	8.48405E+09	1.99345E-12	1.97809E-12	1.96792E-12	1.94271E-12	1.89327E-12	1.84508E-12	1.70774E-12	1.54040E-12
AR	18	41	6.60140E+03	1.84041E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
K	19	40	4.10146E+16	1.50667E-17	1.50667E-17	1.50667E-17	1.50667E-17	1.50667E-17	1.50667E-17	1.50667E-17	1.50667E-17
K	19	42	4.47192E+04	4.06076E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CA	20	41	2.52053E+12	3.22633E-12	3.22625E-12	3.22619E-12	3.22605E-12	3.22577E-12	3.22549E-12	3.22465E-12	3.22353E-12
CA	20	45	1.42623E+07	1.25008E-09	1.25518E-11	5.84185E-13	2.73004E-16	5.96205E-23	1.30204E-29	1.35617E-49	3.08480E-76
CA	20	47	3.91608E+05	6.43007E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	46	7.25049E+06	1.64905E-10	1.93444E-14	4.63558E-17	1.30313E-23	1.02974E-36	8.13694E-50	0.00000E+00	0.00000E+00
SC	21	47	2.96217E+05	2.78825E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	48	1.58253E+05	8.29982E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	49	3.44849E+03	3.17513E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	50	1.03147E+02	1.49295E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	3.48315E+02	1.82540E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	49	2.85246E+07	2.50570E-17	2.51081E-18	5.41672E-19	1.17097E-20	5.47216E-24	2.55727E-27	2.60966E-37	1.24474E-50
V	23	52	2.02084E+02	4.82982E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	53	1.19922E+02	1.97617E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	54	5.50117E+01	2.66600E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39643E+06	7.21929E-11	9.46263E-23	1.13332E-30	1.77922E-50	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	1.72526E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	1.86894E-20	1.86894E-20	1.86894E-20	1.86893E-20	1.86893E-20	1.86893E-20	1.86892E-20	1.86890E-20
MN	25	54	2.61565E+07	2.02946E-11	1.65124E-12	3.10049E-13	4.73675E-15	1.10556E-18	2.58033E-22	3.28073E-33	9.73564E-48
MN	25	56	9.29152E+03	1.10055E-07	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	3.18774E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	4.46324E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	1.40064E-08	6.29357E-09	3.69214E-09	9.73262E-10	6.76289E-11	4.69931E-12	1.57668E-15	3.67584E-20
FE	26	59	3.89409E+06	1.60564E-10	8.09364E-18	1.06920E-22	6.78209E-35	2.72862E-59	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	60	3.15569E+12	4.37179E-26	4.37170E-26	4.37163E-26	4.37148E-26	4.37118E-26	4.37088E-26	4.36997E-26	4.36876E-26
FE	26	61	3.60001E+02	5.45506E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	57	2.34838E+07	1.72945E-16	1.05763E-17	1.64166E-18	1.55833E-20	1.40412E-24	1.26517E-28	9.25529E-41	6.10064E-57
CO	27	58	6.13405E+06	5.91775E-14	1.33679E-18	1.06825E-21	1.92836E-29	6.28355E-45	2.04749E-60	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	3.18731E-10	2.14647E-10	1.64914E-10	8.53280E-11	2.28433E-11	6.11540E-12	1.17334E-13	6.02688E-16
CO	27	61	5.94007E+03	5.34230E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	62	8.34012E+02	2.60447E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	64	2.99999E-01	1.49260E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NI	28	59	2.52053E+12	8.64989E-16	8.64967E-16	8.64952E-16	8.64914E-16	8.64839E-16	8.64764E-16	8.64539E-16	8.64239E-16
NI	28	63	2.90020E+09	1.25677E-13	1.22865E-13	1.21026E-13	1.16547E-13	1.08080E-13	1.00228E-13	7.99323E-14	5.91153E-14
NI	28	65	9.21738E+03	1.86907E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CU	29	64	4.62098E+04	2.21467E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RB	37	86	1.60972E+06	3.07925E-17	6.08870E-35	9.57105E-47	2.97509E-76	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	87	1.00799E+04	1.72954E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	89	4.50096E+06	1.03124E-15	4.80300E-22	[illegible].88593E-26	8.07644E-37	6.32513E-58	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	90	8.86377E+08	2.57195E-20	2.38841E-20	[illegible].27339E-20	2.00949E-20	1.57004E-20	1.22669E-20	5.85073E-21	2.18026E-21
SR	38	91	3.48315E+04	2.31090E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	92	9.75604E+03	1.09497E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	93	4.50095E+02	5.58590E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	89	1.56998E+01	2.12595E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	90	2.30281E+05	2.15466E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	91	5.09667E+06	2.67909E-16	6.05850E-22	1.28350E-25	6.14900E-35	1.41126E-53	3.23901E-72	0.00000E+00	0.00000E+00
Y	39	92	1.27440E+04	8.23331E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	94	1.12200E+03	1.78262E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	96	9.80406E+00	1.66638E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	88	7.20602E+06	4.11910E-19	4.56968E-23	1.85498E-25	2.70206E-32	1.77246E-45	1.16267E-58	0.00000E+00	0.00000E+00
ZR	40	89	2.82249E+05	4.51448E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	93	4.74758E+13	4.58427E-18	4.58426E-18	4.58426E-18	4.58425E-18	4.58423E-18	4.58421E-18	4.58414E-18	4.58406E-18
ZR	40	95	5.[illegible]5534E+06	3.73581E-15	3.27440E-20	1.39199E-23	5.18663E-32	7.20067E-49	9.99678E-66	0.00000E+00	0.00000E+00
ZR	40	97	6.0[illegible]640E+04	1.92774E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	91	2.2[illegible]300E+10	1.65566E-20	1.65075E-20	1.64748E-20	1.63938E-20	1.62319E-20	1.60720E-20	1.56015E-20	1.49956E-20
NB	41	92	8.80746E+05	6.73675E-16	2.95300E-40	7.90926E-70	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	94	6.30134E+11	5.99030E-16	5.98968E-16	5.98926E-16	5.98822E-16	5.98614E-16	5.98407E-16	5.97784E-16	5.96954E-16
NB	41	95	3.02684E+06	8.05470E-17	3.09396E-26	1.63489E-32	3.31856E-48	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	96	8.28132E+04	1.56304E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	97	4.33217E+03	1.45855E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	98	3.06025E+03	4.44049E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	100	3.09994E+00	3.06042E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	93	2.84077E+11	2.46503E-18	2.06455E-18	2.06423E-18	2.06344E-18	2.06185E-18	2.06026E-18	2.05551E-18	2.04919E-18
MO	42	99	2.41515E+05	4.69656E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	101	8.76292E+02	2.46731E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	104	2.61565E+02	3.46838E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	106	7.84813E+03	1.84600E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PD	46	107	2.05134E+14	7.08700E-25	7.08700E-25	7.08700E-25	7.08700E-25	7.08699E-25	7.08698E-25	7.08696E-25	7.08693E-25
PD	46	109	4.83704E+04	1.86307E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	106	7.34422E+05	7.78996E-18	1.22006E-56	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	108	4.10309E+09	6.30808E-14	6.20801E-14	6.14218E-14	5.98065E-14	5.67023E-14	5.37592E-14	4.58150E-14	3.70182E-14
AG	47	110	2.15826E+07	9.50966E-12	4.54661E-13	5.98920E-14	3.77204E-16	1.49619E-20	5.93465E-25	3.70361E-38	9.16763E-56
CD	48	109	3.99508E+07	1.53331E-18	2.96666E-19	9.92423E-20	6.42339E-21	2.69089E-23	1.12720E-25	8.28752E-33	2.55243E-42
CD	48	111	2.92221E+03	3.81665E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	115	1.92541E+05	1.17561E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	117	1.22399E+04	3.53962E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	119	5.97541E+02	1.98567E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	111	2.42444E+05	5.48756E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	112	1.25408E+03	3.10262E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	114	4.27869E+06	5.40793E-19	1.18103E-25	4.28302E-30	3.39215E-41	2.12764E-63	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	115	1.61497E+04	6.19508E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	116	1.40998E+01	2.77876E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	117	6.95931E+03	3.97633E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	118	2.63955E+02	1.43486E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	119	1.26027E+02	1.48255E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	120	4.40093E+01	3.16981E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	122	1.00998E+01	4.33808E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	113	9.94473E+06	2.92201E-15	3.98021E-18	4.89090E-20	8.18662E-25	2.29358E-34	6.42586E-44	1.41310E-72	0.00000E+00
SN	50	121	9.72156E+04	3.67693E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	123	1.07967E+07	5.21282E-14	1.19518E-16	2.07814E-18	8.28493E-23	1.31671E-31	2.09264E-40	8.40058E-67	0.00000E+00
SN	50	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

I	53	130	4.44981E+04	1.36887E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
XE	54	133	4.56018E+05	6.51269E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	132	5.58990E+05	6.17516E-16	6.41185E-67	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	134	6.47801E+07	2.03410E-11	1.02914E-11	5.23820E-12	9.68166E-13	3.30738E-14	1.12984E-15	4.50427E-20	6.13422E-26
EU	63	152	4.17559E+08	2.86998E-10	2.45260E-10	2.20864E-10	1.69970E-10	1.00662E-10	5.96151E-11	1.23832E-11	1.52336E-12
EU	63	154	2.69812E+08	2.76548E-11	2.16842E-11	1.84385E-11	1.22937E-11	5.46504E-12	2.42943E-12	2.13421E-13	8.33455E-15
LU	71	174	1.22687E+07	3.01905E-22	1.43531E-24	4.05818E-26	5.45502E-30	9.85650E-38	1.78091E-45	1.05053E-68	0.00000E+00
LU	71	177	1.38242E+07	1.25644E-19	1.09041E-21	4.60494E-23	1.68776E-26	2.26716E-33	3.04540E-40	7.38157E-61	0.00000E+00
HF	72	173	8.49653E+04	2.87732E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	175	6.04840E+06	1.70005E-12	3.30050E-17	2.30412E-20	3.34352E-28	6.57557E-44	1.29319E-59	0.00000E+00	0.00000E+00
HF	72	178	9.78261E+08	1.11033E-20	1.03829E-20	9.92883E-21	8.87858E-21	7.09961E-21	5.67709E-21	2.90268E-21	1.18676E-21
HF	72	179	1.89304E+10	5.31775E-22	5.29935E-22	5.28712E-22	5.25660E-22	5.19631E-22	5.13664E-22	4.96170E-22	4.73769E-22
HF	72	180	1.98723E+04	1.12657E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	181	3.66357E+06	1.10646E-11	1.83998E-19	1.19876E-24	1.29880E-37	1.52448E-63	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	182	2.84077E+14	5.51425E-27	5.51425E-27	5.51425E-27	5.51425E-27	5.51424E-27	5.51424E-27	5.51422E-27	5.51421E-27
TA	73	180	2.93458E+04	1.34331E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TA	73	182	9.89362E+06	1.62909E-11	2.14575E-14	2.57747E-16	4.07694E-21	1.01931E-30	2.54901E-40	3.98639E-69	0.00000E+00
W	74	181	1.29968E+07	9.97812E-16	4.39652E-18	1.10163E-19	1.39934E-23	1.96242E-31	2.75207E-39	7.59039E-63	0.00000E+00
W	74	185	6.47801E+06	8.10496E-13	3.23112E-17	3.77060E-20	1.75429E-27	3.79694E-42	8.21811E-57	0.00000E+00	0.00000E+00
W	74	187	8.59904E+04	1.61564E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	203	4.02525E+06	3.86135E-18	3.21063E-25	6.11629E-30	9.68836E-42	2.63072E-65	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	205	3.11947E+02	2.97232E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	204	1.19282E+08	3.96942E-20	2.28983E-20	1.58679E-20	6.34327E-21	1.01368E-21	1.61988E-22	6.61060E-25	4.31105E-28
TL	81	206	2.52054E+02	6.92667E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	207	2.86188E+02	5.67760E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	203	1.86782E+05	1.49743E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	205	4.76390E+14	6.82898E-21	6.82898E-21	6.82898E-21	6.82898E-21	6.82898E-21	6.82897E-21	6.82896E-21	6.82895E-21
PB	82	207	7.95989E-01	1.49012E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TOTAL (CURIES/CC)				1.52909E-07	7.00446E-09	4.28560E-09	1.38117E-09	2.78141E-10	1.21469E-10	2.50452E-11	7.34806E-12
TOTAL (CURIES)				7.98600E+00	3.65633E-01	2.23708E-01	7.20972E-02	1.45190E-02	6.34066E-03	1.34912E-03	3.83568E-04

COMPONENT : CONCRETE - RADIAL FOURTH 6 INCHES - RS
VOLUME : 5.37000E+07 CC
: ABOVE VOLUME IS FOR THE FOURTH 6 INCHES OF CONCRETE
: IN THE RADIAL DIRECTION.
:
: (INTERVALS 70-72 TOTGRORS)

NUCLIDE SYM	Z	M	HALF-LIFE (SECONDS)	SHUTDOWN	3.00 YRS	CONCENTRATION (CURIES/CC) AT TIME 5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
H	1	3	3.87233E+08	2.56741E-11	2.16720E-11	1.93560E-11	1.45939E-11	8.29550E-12	4.71544E-12	8.66061E-13	9.04160E-14
HE	2	6	8.09751E-01	1.01907E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
LI	3	8	8.40178E-01	6.78999E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	8	3.00064E-16	2.66960E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	10	7.88563E+13	8.94218E-22	8.94217E-22	8.94216E-22	8.94215E-22	8.94213E-22	8.94210E-22	8.94203E-22	8.94193E-22
B	5	12	1.99754E-02	9.36827E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
C	6	14	1.80978E+11	1.25868E-14	1.25823E-14	1.25792E-14	1.25716E-14	1.25564E-14	1.25413E-14	1.24959E-14	1.24356E-14
F	9	20	1.10823E+01	1.63218E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NE	10	23	3.76710E+01	1.83392E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NA	11	24	5.61521E+04	1.20639E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MG	12	27	5.68153E+02	9.05329E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AL	13	28	1.38629E+02	1.48369E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SI	14	31	9.43057E+03	3.13586E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	1.13873E-12	9.78179E-36	4.10282E-51	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
S	16	35	7.60030E+06	1.65753E-12	2.94916E-16	9.32935E-19	5.25109E-25	1.66350E-37	5.26902E-50	0.00000E+00	0.00000E+00
S	16	37	3.04012E+02	8.59005E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CL	17	36	9.77641E+12	1.19557E-15	1.19556E-15	1.19556E-15	1.19554E-15	1.19552E-15	1.19549E-15	1.19541E-15	1.19530E-15
AR	18	37	3.02606E+06	3.51550E-11	1.35037E-20	7.13556E-27	1.64040E-42	5.96710E-76	0.00000E+00	0.00000E+00	0.00000E+00
AR	18	39	8.48405E+09	2.43246E-13	2.41371E-13	2.40130E-13	2.37054E-13	2.31021E-13	2.25140E-13	2.08383E-13	1.[illegible]963E-13
AR	18	41	6.60140E+03	4.29327E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
K	19	40	4.10166E+16	1.64332E-18	1.64332E-18	1.64332E-18	1.64332E-18	1.64332E-18	1.64332E-18	1.[illegible]-18	1.64332E-18
K	19	42	4.47192E+04	6.43776E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CA	20	41	2.52053E+12	3.51625E-13	3.51616E-13	3.51610E-13	3.51594E-13	3.51564E-13	3.51533E-13	3.51442E-13	3.51326E-13
CA	20	45	1.62623E+07	1.36742E-10	1.37300E-12	6.39022E-14	2.98631E-17	6.52171E-24	1.62427E-30	1.40347E-50	3.37437E-77
CA	20	47	3.91600E+05	7.00809E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	46	7.25049E+06	1.08276E-11	2.11476E-15	5.06767E-18	1.42660E-24	1.12572E-37	8.89541E-51	0.00000E+00	0.00000E+00
SC	21	47	2.96217E+05	6.30556E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	48	1.58253E+05	1.99238E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	49	3.46049E+03	7.36447E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	50	1.03147E+02	3.64590E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	3.48315E+02	1.99350E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	49	2.85246E+07	6.12217E-18	6.13465E-19	1.32367E-19	2.86103E-21	1.33701E-24	6.24818E-28	6.37660E-38	3.04126E-51
V	23	52	2.02084E+02	5.27177E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	53	1.19922E+02	4.60296E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	54	5.50117E+01	6.51209E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39843E+06	7.99806E-12	1.06834E-23	1.25557E-31	1.97115E-51	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	4.01928E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	4.56637E-21	4.56636E-21	4.56636E-21	4.56636E-21	4.56635E-21	4.56634E-21	4.56631E-21	4.56628E-21
MN	25	54	2.61565E+07	4.62927E-12	3.76654E-13	7.07232E-14	1.08047E-15	2.52183E-19	5.88584E-23	7.48340E-34	2.22074E-48
MN	25	56	9.29152E+03	1.20360E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	7.50040E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	1.08746E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	1.52694E-09	6.86108E-10	4.02506E-10	1.06102E-10	7.37271E-12	5.12306E-13	1.71885E-16	4.[illegible]E-21
FE	26	59	3.89409E+06	1.84479E-11	8.85784E-19	1.17015E-23	7.42245E-36	2.98626E-60	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	60	3.15569E+12	1.06770E-26	1.06768E-26	1.06766E-26	1.06763E-26	1.06755E-26	1.06748E-26	1.06726E-26	1.06696E-26
FE	26	61	3.60001E+02	1.33279E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	57	2.34838E+07	4.22464E-17	2.58353E-18	4.01017E-19	3.80661E-21	3.42993E-25	3.09051E-29	2.26084E-41	1.49024E-57
CO	27	58	6.13405E+06	1.34382E-14	3.03563E-19	2.42581E-22	4.37897E-30	1.42689E-45	4.64951E-61	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	3.49474E-11	2.35350E-11	1.80820E-11	9.35582E-12	2.50464E-12	6.70525E-13	1.28652E-14	6.60819E-17
CO	27	61	5.94007E+03	1.24500E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	62	8.34012E+02	6.25452E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00

CO	27	64	2.90999E-01	3.64675E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NI	28	59	2.52053E+12	9.43252E-17	9.43228E-17	9.43212E-17	9.43171E-17	9.43089E-17	9.43007E-17	9.42761E-17	9.42434E-17
NI	28	63	2.90020E+09	1.40086E-14	1.36952E-14	1.34902E-14	1.29909E-14	1.20471E-14	1.11719E-14	8.90966E-15	6.58929E-15
NI	28	65	9.21738E+03	4.35739E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CU	29	64	4.62098E+04	2.41971E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RB	37	86	1.60972E+06	7.48742E-18	1.47857E-35	2.32727E-47	7.23415E-77	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	87	1.00799E+04	4.17857E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	89	4.50096E+06	2.43590E-16	1.13452E-22	6.81690E-27	1.90775E-37	1.49407E-58	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	90	8.86377E+08	6.17704E-21	5.73625E-21	5.46000E-21	4.82620E-21	3.77077E-21	2.94615E-21	1.40517E-21	5.23633E-22
SR	38	91	3.48315E+04	5.58211E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	92	9.75604E+03	2.66981E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	93	4.50095E+02	1.36375E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	89	1.56998E+01	5.18462E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	90	2.30281E+05	2.35010E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	91	5.09667E+06	6.37640E-17	1.63237E-22	3.05481E-26	1.46350E-35	3.35890E-54	7.70905E-73	0.00000E+00	0.00000E+00
Y	39	92	1.27440E+04	1.98103E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	94	1.12200E+03	4.32785E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	96	9.80406E+00	4.02245E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	88	7.20602E+06	9.72247E-20	1.07855E-23	2.49011E-26	6.37779E-33	4.18360E-46	2.74429E-59	0.00000E+00	0.00000E+00
ZR	40	89	2.82249E+05	1.08110E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	93	4.74758E+13	5.04673E-19	5.04672E-19	5.04671E-19	5.04670E-19	5.04668E-19	5.04666E-19	5.04659E-19	5.04649E-19
ZR	40	95	5.63534E+06	9.12534E-16	7.99828E-21	3.40016E-24	1.26692E-32	1.75888E-49	2.44188E-66	0.00000E+00	0.00000E+00
ZR	40	97	6.04840E+04	2.58538E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	91	2.20888E+10	4.03028E-21	4.01832E-21	4.01038E-21	3.99057E-21	3.95124E-21	3.91231E-21	3.79779E-21	3.65030E-21
NB	41	92	8.80746E+05	1.62525E-16	7.12416E-49	1.98812E-70	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	94	6.30134E+11	6.74558E-17	6.74488E-17	6.74441E-17	6.74324E-17	6.74090E-17	6.73856E-17	6.73154E-17	6.72220E-17
NB	41	95	3.02684E+06	1.91264E-17	7.34682E-27	3.88217E-33	7.88016E-49	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	96	8.28132E+04	3.75731E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	97	4.33217E+03	3.48200E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	98	3.06025E+03	1.07859E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	100	3.09994E+00	7.49403E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	93	2.84077E+11	3.40656E-19	3.40578E-19	3.40525E-19	3.40394E-19	3.40132E-19	3.39871E-19	3.39086E-19	3.38043E-19
MO	42	99	2.41515E+05	5.80940E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	101	8.76292E+02	2.96504E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	104	2.61565E+02	8.38727E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	106	7.84813E+03	4.39381E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PD	46	107	2.05134E+14	1.69109E-25	1.69109E-25	1.69109E-25	1.69109E-25	1.69108E-25	1.69108E-25	1.69108E-25	1.69107E-25
PD	46	109	4.83704E+04	[illegible]	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	106	7.34422E+05	1.90332E-[illegible]	2.98096E-57	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	1[illegible]	4.10389E+09	6.94774E-15	6.[illegible]753E-15	6.76503E-15	6.58712E-15	6.24521E-15	5.92106E-15	5.04608E-15	4.07720E-15
AG	47	1[illegible]	2.15826E+07	1.06995E-12	5.11549E-14	6.73858E-15	4.24400E-17	1.68340E-21	6.67720E-26	4.16701E-39	1.03147E-56
CD	48	1[illegible]	3.99508E+07	3.65167E-19	7.06531E-20	2.34351E-20	1.52977E-21	6.40049E-24	2.68467E-26	1.97372E-33	6.07876E-43
CD	48	1[illegible]	2.92221E+03	9.15884E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	115	1.92541E+05	2.85798E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	117	1.22399E+04	8.64823E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	119	5.97541E+02	4.85159E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	111	2.42444E+05	1.33448E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	112	1.25400E+03	7.38953E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	114	4.27869E+06	1.29523E-19	2.82863E-26	1.02581E-30	8.12440E-42	5.09583E-64	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	115	1.61497E+04	1.47606E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	116	1.40998E+01	6.70537E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	117	6.95931E+03	9.49863E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	118	2.63955E+02	3.48381E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	119	1.24027E+02	3.55747E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	120	4.40093E+01	7.74188E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	122	1.00998E+01	1.05992E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	113	9.94473E+06	4.73136E-16	6.44481E-19	7.91942E-21	1.32559E-25	3.71380E-35	1.04048E-44	2.28812E-73	0.00000E+00
SN	50	121	9.72156E+04	4.14673E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	123	1.07967E+07	5.90618E-15	1.35415E-17	2.35456E-19	9.38691E-24	1.49185E-32	2.37098E-41	9.51794E-68	0.00000E+00
SN	50	125	8.12599E+05	7.49193E-14	6.34975E-49	2.63955E-72	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
I	53	130	4.44981E+04	3.26511E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
XE	54	133	4.56018E+05	1.53761E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	132	5.58990E+05	1.50878E-16	1.56661E-67	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	134	6.47801E+07	3.17951E-12	1.15457E-12	5.87662E-13	1.08616E-13	3.71047E-15	1.26754E-16	5.05323E-21	6.88184E-27
EU	63	152	4.17559E+08	3.12718E-11	2.67239E-11	2.40657E-11	1.85202E-11	1.09682E-11	6.49575E-12	1.34929E-12	1.65987E-13
EU	63	154	2.69812E+08	3.03301E-12	2.37819E-12	2.02222E-12	1.34829E-12	5.99371E-13	2.66445E-13	2.34067E-14	9.14080E-16
LU	71	174	1.22687E+07	6.96650E-23	3.31205E-25	9.36442E-27	1.25877E-30	2.27443E-38	4.10953E-46	2.42414E-69	0.00000E+00
LU	71	177	1.38242E+07	2.99124E-20	2.59598E-22	1.09632E-23	4.01812E-27	5.39747E-34	7.25030E-41	1.75736E-61	0.00000E+00
HF	72	173	8.49653E+04	7.03014E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	175	6.04840E+06	1.86230E-13	3.61551E-18	2.61167E-21	3.66263E-29	7.20315E-45	1.41662E-60	0.00000E+00	0.00000E+00
HF	72	178	9.78261E+08	2.66256E-21	2.48981E-[illegible]	2.38092E-21	2.12907E-21	1.70248E-21	1.36136E-21	6.96060E-22	2.84584E-22
HF	72	179	1.89384E+10	1.27010E-22	1.26571E-[illegible]	1.26279E-22	1.25552E-22	1.24110E-22	1.22685E-22	1.18507E-22	1.13156E-22
HF	72	180	1.98723E+04	2.70654E-20	0.00000E+[illegible]	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	181	3.66357E+06	1.22812E-12	2.04228E-20	1.33056E-25	1.44160E-38	1.69209E-64	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	182	2.84077E+14	1.32919E-27	1.32919E-27	1.32919E-27	1.32919E-27	1.32919E-27	1.32919E-27	1.32919E-27	1.32918E-27
TA	73	180	2.93458E+04	3.27908E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TA	73	182	9.89362E+06	1.06578E-12	2.45630E-15	2.95049E-17	4.66595E-22	1.16683E-31	2.91792E-41	4.56332E-70	0.00000E+00
W	74	181	1.20968E+07	2.43788E-16	1.07417E-18	2.88706E-20	3.41891E-24	4.79464E-32	6.72395E-40	1.85451E-63	0.00000E+00
W	74	18[illegible]	6.47801E+06	9.18295E-14	3.66087E-18	4.27220E-21	1.98762E-28	4.30195E-43	9.31115E-58	0.00000E+00	0.00000E+00
W	74	187	8.59984E+04	1.81335E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	203	4.02525E+06	9.32547E-19	7.75395E-26	1.47713E-30	2.33982E-42	5.87040E-66	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	205	3.11947E+02	7.23048E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	204	[illegible].19282E+08	9.53273E-21	5.49911E-21	3.81074E-21	1.52336E-21	2.43430E-22	3.89022E-23	1.58756E-25	1.03532E-28
TL	81	206	2.52054E+02	1.67588E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	207	2.86188E+02	1.36787E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	203	1.86782E+05	3.65860E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	205	4.76390E+14	1.66795E-21	1.66795E-21	1.66795E-21	1.66795E-21	1.66795E-21	1.66795E-21	1.66795E-21	1.66794E-21
PB	82	207	7.95989E-01	3.63517E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
		TOTAL (CURIES/CC)		1.68045E-08	7.64003E-10	4.67387E-10	1.50652E-10	5.03590E-11	1.32683E-11	2.83943E-12	8.21128E-13
		TOTAL (CURIES)		9.02401E-01	4.10270E-02	2.50987E-02	8.09003E-03	1.63028E-03	7.12505E-04	1.52477E-04	4.40946E-05

COMPONENT : CONCRETE - RADIAL FIFTH 6 INCHES - R5
VOLUME : 5.53000E+07 CC
: ABOVE VOLUME IS FOR THE FIFTH 6 INCHES OF CONCRETE
: IN THE RADIAL DIRECTION.
:
: (INTERVALS 73-75 TOTGRDR5)

NUCLIDE SYM	Z	N	HALF-LIFE (SECONDS)	CONCENTRATION (CURIES/CC) AT TIME SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
H	1	3	3.87233E+08	3.61182E-12	3.04880E-12	2.72310E-12	2.05306E-12	1.16702E-12	6.63365E-13	1.21837E-13	1.27198E-14
HE	2	6	8.09751E-01	2.32212E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
LI	3	8	8.40178E-01	9.55712E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	8	3.00064E-16	6.06896E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	10	7.88563E+13	1.82166E-22	1.82166E-22	1.82166E-22	1.82166E-22	1.82165E-22	1.82165E-22	1.82163E-22	1.82161E-22
B	5	12	1.99754E-02	1.31849E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
C	6	14	1.80978E+11	1.77416E-15	1.77349E-15	1.77306E-15	1.77199E-15	1.76985E-15	1.76771E-15	1.76132E-15	1.75282E-15
F	9	20	1.10023E+01	3.47013E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NE	10	23	3.76710E+01	4.34640E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NA	11	24	5.41521E+04	1.81578E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MG	12	27	5.68153E+02	2.13001E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AL	13	28	1.38629E+02	2.18321E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SI	14	31	9.43057E+03	7.17042E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	2.61218E-13	2.24388E-36	9.41163E-52	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
S	16	35	7.60030E+06	2.33919E-13	4.16196E-17	1.31660E-19	7.41056E-26	2.34760E-38	7.43700E-51	0.00000E+00	0.00000E+00
S	16	37	3.04012E+02	2.04115E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CL	17	36	9.77641E+12	1.70043E-16	1.70042E-16	1.70041E-16	1.70039E-16	1.70035E-16	1.70031E-16	1.70020E-16	1.70005E-16
AR	18	37	3.02684E+06	8.22348E-12	3.15879E-21	1.66915E-27	3.38810E-43	1.39583E-74	0.00000E+00	0.00000E+00	0.00000E+00
AR	18	39	8.48405E+09	3.86409E-14	3.83432E-14	3.81460E-14	3.76574E-14	3.66989E-14	3.57648E-14	3.31028E-14	2.98590E-14
AR	18	41	6.60140E+03	1.01001E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
K	19	40	4.10146E+16	2.31345E-19	2.31345E-19	2.31345E-19	2.31345E-19	2.31345E-19	2.31345E-19	2.31345E-19	2.31345E-19
K	19	42	4.47192E+04	6.26562E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CA	20	41	2.52053E+12	4.93831E-14	4.93818E-14	4.93809E-14	4.93788E-14	4.93745E-14	4.93702E-14	4.93574E-14	4.93402E-14
CA	20	45	1.42623E+07	1.93228E-11	1.94017E-13	9.02025E-15	4.21991E-18	9.21574E-25	2.01261E-31	2.09628E-51	4.76828E-78
CA	20	47	3.91608E+05	9.84282E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	46	7.25049E+06	2.55125E-12	2.99279E-16	7.17173E-19	2.01608E-25	1.59312E-38	1.25887E-51	0.00000E+00	0.00000E+00
SC	21	47	2.96217E+05	1.44693E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	48	1.58253E+05	4.79983E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	49	3.44849E+03	1.72422E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	50	1.03147E+02	8.90964E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	3.48315E+02	2.81183E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	49	2.85246E+07	1.49674E-18	1.49979E-19	3.23559E-20	6.99459E-22	3.26870E-25	1.52754E-28	1.55896E-38	7.43523E-52
V	23	52	2.02084E+02	7.42894E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	53	1.19922E+02	1.11608E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	54	5.50117E+01	1.59170E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39843E+06	1.15364E-12	1.51212E-24	1.81103E-32	2.84318E-52	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	9.44370E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	1.11638E-21	1.11638E-21	1.11638E-21	1.11637E-21	1.11637E-21	1.11637E-21	1.11636E-21	1.11636E-21
MN	25	54	2.61565E+07	1.06721E-12	8.68321E-14	1.63042E-14	2.49087E-16	5.81373E-20	1.35690E-23	1.72521E-34	5.11959E-49
MN	25	56	9.29152E+03	1.70214E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	1.77727E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	2.65228E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	2.14537E-10	9.63992E-11	5.65528E-11	1.49075E-11	1.03588E-12	7.19799E-16	2.41501E-17	5.63032E-22
FE	26	59	3.89409E+06	2.61129E-12	1.25382E-19	1.65634E-24	1.05064E-36	4.22702E-61	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	60	3.15569E+12	2.60936E-27	2.60931E-27	2.60927E-27	2.60918E-27	2.60900E-27	2.60882E-27	2.60828E-27	2.60755E-27
FE	26	61	3.60001E+02	3.25831E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	57	2.34838E+07	1.03264E-17	6.31499E-19	9.80217E-20	9.30460E-22	8.38387E-26	7.55421E-30	5.52624E-42	3.64263E-58
CO	27	58	6.13405E+06	3.08940E-15	6.97880E-20	5.57606E-23	1.00671E-30	3.28037E-46	1.06891E-61	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	4.96416E-12	3.34307E-12	2.56850E-12	1.32896E-12	3.55779E-13	9.52460E-14	1.82746E-15	9.38673E-18
CO	27	61	5.94007E+03	2.92629E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	62	8.34012E+02	1.58702E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	64	2.99999E-01	8.91522E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NI	28	59	2.52053E+12	1.32796E-17	1.32793E-17	1.32790E-17	1.32784E-17	1.32773E-17	1.32761E-17	1.32727E-17	1.32681E-17
NI	28	63	2.90020E+09	2.02185E-15	1.97662E-15	1.94702E-15	1.87497E-15	1.73875E-15	1.61243E-15	1.28592E-15	9.51027E-16
NI	28	65	9.21738E+03	1.02480E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CU	29	64	4.62098E+04	3.41491E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RB	37	86	1.60972E+06	1.82301E-18	3.59997E-36	5.66636E-48	1.76135E-77	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	87	1.00799E+04	1.01184E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	89	4.50096E+06	5.79174E-17	2.69751E-23	1.62083E-27	4.53598E-38	3.55239E-59	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	90	8.86377E+08	1.48861E-21	1.38239E-21	1.31581E-21	1.16307E-21	9.08723E-22	7.09996E-22	3.38633E-22	1.26191E-22
SR	38	91	3.48315E+04	1.35148E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	92	9.75604E+03	6.51559E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	93	4.50096E+02	3.33184E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	89	1.56990E+01	1.26559E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	90	2.30281E+05	3.30853E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	91	5.09667E+06	1.52558E-17	3.90550E-23	7.30875E-27	3.56148E-36	8.03629E-55	1.84442E-73	0.00000E+00	0.00000E+00
Y	39	92	1.27440E+04	4.78100E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	94	1.12290E+03	1.05234E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	96	9.80406E+00	9.83370E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	88	7.20602E+06	2.30927E-20	2.56177E-24	5.91448E-27	1.51484E-33	9.93684E-47	6.51821E-60	0.00000E+00	0.00000E+00
ZR	40	89	2.82249E+05	2.59948E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	93	4.74758E+13	7.19288E-20	7.19287E-20	7.19287E-20	7.19285E-20	7.19282E-20	7.19279E-20	7.19269E-20	7.19255E-20
ZR	40	95	5.63534E+06	2.23046E-16	1.95498E-21	8.51085E-25	3.09668E-33	4.29916E-50	5.96858E-67	0.00000E+00	0.00000E+00
ZR	40	97	6.04840E+04	4.78507E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	91	2.20888E+10	9.82203E-22	9.79290E-22	9.77352E-22	9.72525E-22	9.62942E-22	9.53453E-22	9.25544E-22	8.89599E-22
NB	41	92	8.80746E+05	3.93253E-17	1.72379E-49	4.61697E-71	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	94	6.30134E+11	9.95058E-18	9.94955E-18	9.94886E-18	9.94713E-18	9.94368E-18	9.94022E-18	9.92988E-18	9.91610E-18
NB	41	95	3.02684E+06	4.56727E-18	1.75438E-27	9.27038E-34	1.88173E-49	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	96	8.28132E+04	9.05800E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	97	4.33217E+03	8.35136E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	98	3.06025E+03	2.61974E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	100	3.09994E+00	1.83149E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	93	2.84077E+11	7.00614E-20	7.00452E-20	7.00344E-20	7.00074E-20	6.99536E-20	6.98998E-20	6.97385E-20	6.95240E-20
MO	42	99	2.41515E+05	9.55825E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	101	8.76292E+02	4.73605E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	104	2.61565E+02	2.03270E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	106	7.84813E+03	1.05071E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PD	46	107	2.05134E+14	4.05484E-26	4.05484E-26	4.05484E-26	4.05484E-26	4.05483E-26	4.05483E-26	4.05482E-26	4.05480E-26
PD	46	109	4.83704E+04	1.06363E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	106	7.34422E+05	4.65320E-19	7.28779E-58	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	108	4.10389E+09	9.94929E-16	9.79167E-16	9.68764E-16	9.43287E-16	8.94326E-16	8.47905E-16	7.22608E-16	5.83861E-16
AG	47	110	2.15826E+07	1.59944E-13	7.64699E-15	1.00733E-15	6.34424E-18	2.51644E-22	9.98156E-27	6.22915E-40	1.54192E-57
CD	48	109	3.99508E+07	8.74144E-20	1.69131E-20	5.65782E-21	3.66198E-22	1.53408E-24	6.42663E-27	4.72473E-34	1.45515E-43
CD	48	111	2.92221E+03	2.20587E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	115	1.92541E+05	6.95745E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	117	1.22399E+04	2.11427E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	119	5.97541E+02	1.18611E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	111	2.42444E+05	3.24948E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	112	1.25400E+03	1.76902E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	114	4.27869E+06	3.11479E-20	6.80233E-27	2.46688E-31	1.95377E-42	1.22545E-64	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	115	1.61497E+04	3.53484E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	116	1.40998E+01	1.62215E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	117	6.95931E+03	2.27942E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	118	2.63958E+02	8.47165E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	119	1.26027E+02	8.56759E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	120	4.40093E+01	1.89212E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	122	1.00998E+01	2.59128E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	113	9.94473E+06	9.65830E-17	1.31560E-19	1.61662E-21	2.70598E-26	7.58113E-36	2.12398E-45	4.67083E-74	0.00000E+00
SN	50	121	9.72156E+04	6.10656E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	123	1.07967E+07	8.76156E-16	2.00883E-18	3.49289E-20	1.39251E-24	2.21310E-33	3.51725E-42	1.41195E-68	0.00000E+00

I	53	130	4.44981E+04	7.81870E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
XE	54	133	4.56018E+05	3.65535E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	132	5.58990E+05	3.68863E-17	3.63002E-68	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	134	6.47801E+07	4.71764E-13	1.71311E-13	8.71950E-14	1.61161E-14	5.50546E-16	1.88073E-17	7.49780E-22	1.02110E-27
EU	63	152	4.17559E+08	4.39374E-12	3.75476E-12	3.38128E-12	2.60212E-12	1.54106E-12	9.12665E-13	1.89578E-13	2.33215E-14
EU	63	154	2.69812E+08	4.32193E-13	3.38884E-13	2.68160E-13	1.92127E-13	8.54083E-14	3.79674E-14	3.33537E-15	1.30253E-16
LU	71	174	1.22687E+07	1.62511E-23	7.72607E-26	2.18446E-27	2.93635E-31	5.30560E-39	9.58637E-47	5.65483E-70	0.00000E+00
LU	71	177	1.38242E+07	7.15956E-21	6.21350E-23	2.62404E-24	9.61739E-28	1.29189E-34	1.73536E-41	4.20624E-62	0.00000E+00
HF	72	175	8.49653E+04	1.71872E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	175	6.04840E+06	2.65744E-14	5.15921E-19	3.72676E-22	5.22644E-38	1.02787E-45	2.02146E-61	0.00000E+00	0.00000E+00
HF	72	178	9.78261E+08	6.40964E-22	5.99379E-22	5.73165E-22	5.12537E-22	4.09842E-22	3.27723E-22	1.67564E-22	6.85087E-23
HF	72	179	1.89384E+10	3.04778E-23	3.03724E-23	3.03023E-23	3.01278E-23	2.97818E-23	2.94398E-23	2.84372E-23	2.71533E-23
HF	72	180	1.98723E+04	6.52476E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	181	3.66357E+06	1.82068E-13	3.02768E-21	1.97256E-26	2.13717E-39	2.50852E-65	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	182	2.84077E+14	3.21293E-28	3.21293E-28	3.21293E-28	3.21293E-28	3.21292E-28	3.21292E-28	3.21292E-28	3.21290E-28
TA	73	180	2.93458E+04	8.01035E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TA	73	182	9.89362E+06	2.86567E-13	3.77266E-16	4.53170E-18	7.16649E-23	1.79215E-32	4.48168E-42	7.00886E-71	0.00000E+00
W	74	181	1.20968E+07	5.95996E-17	2.62605E-19	7.05793E-21	8.35830E-25	1.17216E-32	1.64382E-40	4.53376E-64	0.00000E+00
W	74	185	6.47801E+06	1.36858E-14	5.45596E-19	6.36705E-22	2.96224E-29	6.41139E-44	1.38768E-58	0.00000E+00	0.00000E+00
W	74	187	8.59984E+04	2.69656E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	203	4.02525E+06	2.25749E-19	1.87706E-26	3.57581E-31	5.66418E-43	1.42199E-66	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	205	3.11947E+02	1.76110E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	204	1.19282E+08	2.29766E-21	1.32544E-21	9.18498E-22	3.67173E-22	5.86755E-23	9.37653E-24	3.82648E-26	2.49541E-29
TL	81	206	2.52054E+02	4.06323E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	207	2.86188E+02	3.30475E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	203	1.86782E+05	8.94438E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	205	4.76390E+14	4.07658E-22	4.07658E-22	4.07658E-22	4.07658E-22	4.07658E-22	4.07658E-22	4.07657E-22	4.07657E-22
PB	82	207	7.95989E-01	8.87545E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TOTAL (CURIES/CC)				2.38855E-09	1.07438E-10	6.57197E-11	2.11920E-11	4.27636E-12	1.87080E-12	4.03025E-13	1.18861E-13
TOTAL (CURIES)				1.32087E-01	5.94131E-03	3.63430E-03	1.17191E-03	2.36482E-04	1.03455E-04	2.22873E-05	6.57302E-06

COMPONENT : CONCRETE - RADIAL SIXTH 6 INCHES - R5
VOLUME : 5.68000E+07 CC
: ABOVE VOLUME IS FOR THE SIXTH 6 INCHES OF CONCRETE
: IN THE RADIAL DIRECTION.
:
: (INTERVALS 76-78 TOTGRDRS)

NUCLIDE			HALF-LIFE	CONCENTRATION (CURIES/CC) AT TIME							
SYM	Z	M	(SECONDS)	SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
H	1	3	3.87233E+08	6.37434E-13	5.38069E-13	4.80588E-13	3.62335E-13	2.05961E-13	1.17076E-13	2.15024E-14	2.24486E-15
HE	2	6	8.09751E-01	5.35428E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
LI	3	8	8.40178E-01	1.68751E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	8	3.00064E-16	1.39535E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	10	7.88563E+13	4.01762E-23	4.01761E-23	4.01761E-23	4.01760E-23	4.01759E-23	4.01758E-23	4.01755E-23	4.01750E-23
B	5	12	1.99754E-02	2.32780E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
C	6	14	1.80978E+11	3.13571E-16	3.13458E-16	3.13382E-16	3.13193E-16	3.12814E-16	3.12436E-16	3.11306E-16	3.09804E-16
F	9	20	1.10023E+01	8.42731E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NE	10	23	3.76710E+01	1.03598E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NA	11	24	5.41521E+04	3.21407E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MG	12	27	5.68153E+02	5.04617E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AL	13	28	1.38629E+02	3.99938E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SI	14	31	9.43057E+03	1.65522E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	6.04965E-14	5.19670E-37	2.17968E-52	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
S	16	35	7.60030E+06	4.13798E-14	7.36244E-18	2.32904E-20	1.31092E-26	4.15287E-39	1.31559E-51	0.00000E+00	0.00000E+00
S	16	37	3.04012E+02	4.87564E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CL	17	36	9.77641E+12	3.02937E-17	3.02935E-17	3.02934E-17	3.02931E-17	3.02924E-17	3.02917E-17	3.02897E-17	3.02870E-17
AR	18	37	3.02684E+06	1.93819E-12	7.44494E-22	3.93402E-28	7.98540E-44	3.28981E-75	0.00000E+00	0.00000E+00	0.00000E+00
AR	18	39	8.48405E+09	7.44610E-15	7.38473E-15	7.35073E-15	7.25658E-15	7.07188E-15	6.89188E-15	6.37890E-15	5.75383E-15
AR	18	41	6.60140E+03	2.39289E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
K	19	40	4.10146E+16	4.08530E-20	4.08530E-20	4.08530E-20	4.08530E-20	4.08530E-20	4.08530E-20	4.08530E-20	4.08530E-20
K	19	42	4.47192E+04	1.10906E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CA	20	41	2.52053E+12	8.69991E-15	8.69968E-15	8.69953E-15	8.69915E-15	8.69839E-15	8.69764E-15	8.69538E-15	8.69236E-15
CA	20	45	1.42623E+07	3.42166E-12	3.43562E-14	1.59901E-15	7.47255E-19	1.63191E-25	3.56390E-32	3.71206E-52	8.44359E-79
CA	20	47	3.91608E+05	1.73410E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	46	7.25049E+06	4.52743E-13	5.31098E-17	1.27269E-19	3.57772E-26	2.82713E-39	2.23398E-52	0.00000E+00	0.00000E+00
SC	21	47	2.96217E+05	3.35367E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	48	1.58253E+05	1.16008E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	49	3.44849E+03	4.06865E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	50	1.03147E+02	2.17977E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	3.48315E+02	4.97369E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	49	2.85246E+07	3.66317E-19	3.67064E-20	7.91889E-21	1.71188E-22	7.99994E-26	3.73856E-29	3.81545E-39	1.81972E-52
V	23	52	2.02084E+02	1.31307E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	53	1.19922E+02	2.67290E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	54	5.50117E+01	3.89483E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39843E+06	2.08648E-13	2.72698E-25	3.26604E-33	5.12742E-53	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	2.23471E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	2.73226E-22	2.73225E-22	2.73225E-22	2.73225E-22	2.73225E-22	2.73224E-22	2.73223E-22	2.73221E-22
MN	25	54	2.61565E+07	2.48307E-13	2.02031E-14	3.79348E-15	5.79547E-17	1.35267E-20	3.15707E-24	4.01402E-35	1.19117E-49
MN	25	56	9.29152E+03	3.01807E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	4.23641E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	6.47781E-17	0.00000E+00	0.00000E+00	0.00000E[illegible]	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	3.78082E-11	1.69885E-11	9.96638E-12	2.62718E-[illegible]	1.82554E-13	1.26851E-14	4.25601E-18	9.92238E-23
FE	26	59	3.89409E+06	4.63349E-13	2.22478E-20	2.93901E-25	1.86426E-37	7.50045E-62	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	60	3.15569E+12	6.38422E-28	6.38409E-28	6.38401E-28	6.38378E-28	6.38334E-28	6.38290E-28	6.38157E-28	6.37980E-28
FE	26	61	3.60091E+02	7.97432E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	57	2.34838E+07	2.52691E-18	1.54530E-19	2.39863E-20	2.27687E-22	2.05156E-26	1.84854E-30	1.35229E-42	8.91365E-59
CO	27	58	6.13405E+06	7.17093E-16	1.61968E-20	1.29447E-23	2.33672E-31	7.61419E-47	2.48108E-62	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	8.83628E-13	5.95072E-13	4.57197E-13	2.36558E-13	6.33291E-14	1.69539E-14	3.25290E-16	1.67085E-18
CO	27	61	5.94007E+03	6.92787E-19	0.00000E+00	0.00000E+00	0.00000E[illegible]	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	62	8.34012E+02	3.64230E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00

CO	27	60	2.99999E-01	2.18189E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NI	28	59	2.52053E+12	2.34525E-18	2.34519E-18	2.34515E-18	2.34505E-18	2.34485E-18	2.34464E-18	2.34403E-18	2.34322E-18
NI	28	63	2.90029E+09	3.66004E-16	3.55860E-16	3.50532E-16	3.37559E-16	3.13036E-16	2.90294E-16	2.31511E-16	1.71218E-16
NI	28	65	9.21738E+03	2.42798E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CU	29	64	4.62098E+04	6.04317E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RB	37	86	1.60972E+06	4.44572E-19	8.77911E-37	1.38184E-48	4.29534E-78	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	87	1.00799E+04	2.45575E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	89	4.50096E+06	1.30475E-17	6.44948E-26	3.87523E-28	1.00451E-38	8.49339E-60	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	90	8.86377E+08	3.59068E-22	3.34188E-22	3.18094E-22	2.81169E-22	2.19681E-22	1.71639E-22	8.18636E-23	3.05063E-23
SR	38	91	3.40315E+04	3.27962E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	92	9.75604E+03	1.59219E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	93	4.50095E+02	8.14969E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	89	1.56990E+01	3.09351E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	90	2.30281E+05	5.84269E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	91	5.09667E+06	3.66651E-18	9.30630E-24	1.75655E-27	8.41530E-37	1.93141E-55	4.43279E-74	0.00000E+00	0.00000E+00
Y	39	92	1.27440E+04	1.15711E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	94	1.12200E+03	2.56335E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	96	9.80406E+00	2.40667E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	90	7.20602E+06	5.51407E-21	6.11699E-25	1.41226E-27	3.61714E-34	2.37272E-47	1.55642E-60	0.00000E+00	0.00000E+00
ZR	40	89	2.82249E+05	6.27298E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	93	4.74750E+13	1.28360E-20	1.28360E-20	1.28360E-20	1.28360E-20	1.28359E-20	1.28358E-20	1.28357E-20	1.28354E-20
ZR	40	95	5.63534E+06	5.45788E-17	4.78378E-22	2.03364E-25	7.57748E-34	1.05199E-50	1.46049E-67	0.00000E+00	0.00000E+00
ZR	40	97	6.04040E+04	1.02452E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	91	2.20888E+10	2.39723E-22	2.39012E-22	2.38539E-22	2.37361E-22	2.35022E-22	2.32706E-22	2.25895E-22	2.17122E-22
NB	41	92	8.80746E+05	9.54235E-18	4.18282E-50	1.12032E-71	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	94	6.30134E+11	1.82656E-18	1.82635E-18	1.82622E-18	1.82591E-18	1.82527E-18	1.82464E-18	1.82274E-18	1.82021E-18
NB	41	95	3.02684E+06	1.09592E-18	4.20963E-28	2.22443E-34	4.51523E-50	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	96	8.28132E+04	2.19046E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	97	4.33217E+03	2.01118E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	98	3.06025E+03	6.37505E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	100	3.09994E+00	6.48112E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	93	2.84077E+11	1.54940E-20	1.54905E-20	1.54881E-20	1.54821E-20	1.54702E-20	1.54583E-20	1.54226E-20	1.53752E-20
MO	42	99	2.41515E+05	1.09502E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	101	8.76292E+02	9.21966E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	104	2.61565E+02	4.93743E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	106	7.84013E+03	2.52290E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PD	46	107	2.05136E+14	9.76371E-27	9.76370E-27	9.76370E-27	9.76369E-27	9.76369E-27	9.76367E-27	9.76364E-27	9.76360E-27
PD	46	109	4.03706E+04	2.55915E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	106	7.34422E+05	1.13884E-19	1.78364E-58	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	108	4.10389E+09	1.70358E 16	1.75529E-16	1.73660E-16	1.69101E-16	1.60323E-16	1.52002E-16	1.29540E-16	1.04667E-16
AG	47	110	2.15826E+07	2.97581E-14	1.42275E-15	1.87417E-16	1.10037E-18	4.68196E-23	1.05710E-27	1.15895E-40	2.86870E-58
CD	48	109	3.99508E+07	2.10187E-20	4.06673E-21	1.36042E-21	8.80519E-23	3.68867E-25	1.54527E-27	1.13606E-34	3.49888E-46
CD	48	111	2.92221E+03	5.33034E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	115	1.92541E+05	1.69649E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	117	1.22399E+04	5.17447E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	119	5.97541E+02	2.90292E-24	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	111	2.42444E+05	7.92503E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	112	1.25600E+03	4.25389E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	114	4.27069E+06	7.51763E-21	1.64176E-27	5.95387E-32	4.71546E-43	2.95766E-65	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	115	1.61497E+04	8.50271E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	116	1.40990E+01	3.93397E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	117	6.95931E+03	5.49198E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	118	2.63955E+02	2.06369E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	119	1.26027E+02	2.07020E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	120	4.40093E+01	4.62952E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	122	1.00990E+01	6.34201E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	113	9.94473E+06	2.13439E-17	2.90736E-20	3.57258E-22	5.97996E-27	1.67536E-36	4.69380E-46	1.03221E-74	0.00000E+00
SN	50	121	9.72156E+04	1.11800E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	123	1.07967E+07	1.61513E-16	3.70313E-19	6.63080E-21	2.56699E-25	4.07968E-34	6.40379E-43	2.60282E-69	0.00000E+00
SN	50	125	8.12599E+05	2.00853E-15	1.70215E-50	7.07573E-74	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
I	53	130	6.64981E+04	1.87083E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
XE	54	133	6.56018E+05	8.74073E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	132	5.58990E+05	9.02770E-18	9.37373E-69	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	134	6.47001E+07	8.72057E-14	3.16669E-14	1.61181E-14	2.97907E-15	1.01769E-16	3.47654E-18	1.38597E-22	1.88751E-28
EU	63	152	4.17559E+08	7.74490E-13	6.61063E-13	5.96028E-13	4.84663E-13	2.71647E-13	1.60870E-13	3.34175E-14	4.11095E-15
EU	63	154	2.69812E+08	7.71717E-16	6.85106E-16	5.14534E-16	3.43060E-16	1.5250[illegible]E-14	6.77941E-15	5.95559E-16	2.32578E-17
LU	71	174	1.22687E+07	3.82537E-24	1.81665E-26	5.14282E-28	6.91193E-32	1.24889E-39	2.25655E-47	1.33110E-70	0.00000E+00
LU	71	177	1.38262E+07	1.72156E-21	1.49407E-23	6.38966E-25	2.31256E-28	3.10642E-35	4.17279E-42	1.01142E-62	0.00000E+00
HF	72	173	8.49653E+04	4.20665E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	175	6.84840E+06	4.75376E-15	9.22905E-20	6.66662E-23	9.34932E-31	1.83870E-46	3.61609E-62	0.00000E+00	0.00000E+00
HF	72	178	9.78261E+08	1.54841E-22	1.44795E-22	1.38463E-22	1.23817E-22	9.90079E-23	7.91700E-23	4.04796E-23	1.65500E-23
HF	72	179	1.09384E+10	7.34355E-24	7.31815E-24	7.30127E-24	7.25922E-24	7.17586E-24	7.09345E-24	6.85187E-24	6.54252E-24
HF	72	180	1.90723E+04	1.57793E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	181	3.66357E+06	3.37088E-16	5.60557E-22	3.65207E-27	3.95605E-40	4.64439E-66	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	182	2.84077E+14	7.78700E-29	7.78700E-29	7.78700E-29	7.78700E-29	7.78699E-29	7.78699E-29	7.78697E-29	7.78694E-29
TA	73	180	2.93450E+04	1.959[illegible]E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TA	73	182	9.89362E+06	5.44579E-14	7.16939E-17	8.61183E-19	1.34109E-23	3.46571E-33	8.51676E-43	1.33193E-71	0.00000E+00
W	74	181	1.20968E+07	1.45863E-17	6.42697E-20	1.72735E-21	2.84560E-25	2.06073E-33	4.02307E-41	1.10959E-64	0.00000E+00
W	74	185	6.47001E+06	2.53432E-15	1.01033E-19	1.17904E-22	5.60545E-30	1.18725E-44	2.56969E-59	0.00000E+00	0.00000E+00
W	74	187	8.57904E+04	4.99691E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	203	4.0[illegible]525E+06	5.47760E-20	4.55459E-27	8.67653E-32	1.37639E-43	3.66821E-67	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	205	3.[illegible]1947E+02	4.29609E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	204	1.19282E+08	5.55632E-22	3.20526E-22	2.22116E-22	8.07919E-23	1.61892E-23	2.26749E-24	9.25340E-27	6.03453E-30
TL	81	206	2.52054E+02	9.87270E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	207	2.86108E+02	8.88551E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	203	1.86782E+05	2.18906E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	205	4.76390E+14	9.97467E-23	9.97467E-23	9.97466E-23	9.97466E-23	9.97466E-23	9.97465E-23	9.97464E-23	9.97462E-23
PB	82	207	7.95989E-01	2.16971E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TOTAL (CURIES/CC)				4.25289E-10	1.89487E-11	1.15903E-11	3.73090E-12	7.55435E-13	3.30753E-13	7.16261E-14	2.14471E-14
TOTAL (CURIES)				2.41564E-02	1.07629E-03	6.58327E-04	2.12370E-04	4.29087E-05	1.07866E-05	4.06634E-06	1.21828E-06

COMPONENT : CONCRETE - RADIAL SEVENTH 6 INCHES - R5
VOLUME : 5.84000E+07 CC
ABOVE VOLUME IS FOR THE SEVENTH 6 INCHES OF CONCRETE
IN THE RADIAL DIRECTION.

(INTERVALS 79-81 TOTORDRS)

NUCLIDE SYM	Z	N	HALF-LIFE (SECONDS)	CONCENTRATION (CURIES/CC) AT TIME SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
H	1	3	3.87233E+08	1.33159E-13	1.12462E-13	1.00394E-13	7.56912E-14	4.30250E-14	2.44566E-14	4.49182E-15	4.60947E-16
HE	2	6	8.09751E-01	1.24680E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
LI	3	8	8.40178E-01	3.52617E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	8	3.00664E-16	3.23951E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	10	7.88563E+13	9.23616E-24	9.23615E-24	9.23615E-24	9.23613E-24	9.23611E-24	9.23608E-24	9.23600E-24	9.23590E-24
B	5	12	1.99754E-02	4.06332E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
C	6	14	1.80970E+11	6.55528E-17	6.55291E-17	6.55132E-17	6.54737E-17	6.53966E-17	6.53156E-17	6.50792E-17	6.47653E-17
F	9	20	1.10023E+01	2.05092E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NE	10	23	3.76710E+01	2.48102E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NA	11	24	5.41521E+04	6.72403E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MG	12	27	5.68153E+02	1.20238E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AL	13	28	1.38629E+02	8.52699E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SI	14	31	9.43057E+03	3.85354E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	1.41286E-14	1.21366E-37	5.09050E-53	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
S	16	35	7.60030E+06	8.65625E-15	1.54015E-18	4.87213E-21	2.74231E-27	8.68741E-40	2.75209E-52	0.00000E+00	0.00000E+00
S	16	37	3.04012E+02	1.16976E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CL	17	36	9.77641E+12	6.35438E-18	6.35433E-18	6.35431E-18	6.35423E-18	6.35409E-18	6.35395E-18	6.35352E-18	6.35295E-18
AR	18	37	3.02684E+06	4.59762E-13	1.76603E-22	9.33197E-29	1.89423E-44	7.80384E-76	0.00000E+00	0.00000E+00	0.00000E+00
AR	18	39	8.48405E+09	1.61987E-15	1.60739E-15	1.59912E-15	1.57864E-15	1.53846E-15	1.49930E-15	1.38770E-15	1.25172E-15
AR	18	41	6.60140E+03	5.70202E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
K	19	40	4.10146E+16	8.53586E-21	8.53586E-21	8.53586E-21	8.53586E-21	8.53586E-21	8.53586E-21	8.53586E-21	8.53586E-21
K	19	42	4.47192E+04	2.31939E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CA	20	41	2.52053E+12	1.81656E-15	1.81651E-15	1.81648E-15	1.81640E-15	1.81624E-15	1.81609E-15	1.81561E-15	1.81498E-15
CA	20	45	1.42623E+07	7.15866E-13	7.18786E-15	3.34538E-16	1.56338E-19	3.41421E-26	7.45625E-33	7.76632E-53	0.00000E+00
CA	20	47	3.91608E+05	3.62092E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	46	7.25049E+06	9.47818E-14	1.11185E-17	2.66438E-20	7.48995E-27	5.91860E-40	4.67685E-53	0.00000E+00	0.00000E+00
SC	21	47	2.96217E+05	7.84179E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	48	1.58253E+05	2.81177E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	49	3.44849E+03	9.66302E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	50	1.03147E+02	5.33928E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	3.48315E+02	1.04010E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	49	2.85246E+07	8.97578E-20	8.99408E-21	1.94035E-21	4.19459E-23	1.96021E-26	9.16053E-30	9.34893E-40	4.45083E-53
V	23	52	2.02084E+02	2.74518E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	53	1.19922E+02	6.42[illegible]63E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	54	5.50117E+01	9.54170E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39843E+06	4.38891E-14	5.75272E-26	6.88992E-34	1.08166E-53	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	5.31911E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	6.69478E-23	6.69478E-23	6.69478E-23	6.69477E-23	6.69476E-23	6.69475E-23	6.69471E-23	6.69466E-23
MN	25	54	2.61565E+07	5.82339E-14	4.73811E-15	8.89662E-16	1.35918E-17	3.17234E-21	7.40408E-25	9.41383E-36	2.79357E-50
MN	25	56	9.29152E+03	6.31398E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	1.01479E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	1.58432E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	7.89552E-12	3.54774E-12	2.08129E-12	5.48636E-13	3.81230E-14	2.64904E-15	8.88786E-19	2.07210E-23
FE	26	59	3.89409E+06	9.69565E-14	4.65540E-21	6.14993E-26	3.90100E-38	1.56948E-62	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	60	3.15569E+12	1.56388E-28	1.56385E-28	1.56383E-28	1.56377E-28	1.56366E-28	1.56356E-28	1.56323E-28	1.56280E-28
FE	26	61	3.60001E+02	1.95390E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	57	2.34838E+07	6.19072E-19	3.78587E-20	5.87645E-21	5.57815E-23	5.02617E-27	4.52879E-31	3.31301E-43	2.18377E-59
CO	27	58	6.13405E+06	1.67858E-16	3.79182E-21	3.03010E-24	5.46981E-32	1.78234E-47	5.80774E-63	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	1.85073E-13	1.24636E-13	9.57583E-14	4.95462E-14	1.32641E-14	3.55094E-15	6.81309E-17	3.49954E-19
CO	27	61	5.94007E+03	1.64996E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	62	8.34012E+02	8.82705E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	64	2.99999E-01	5.34609E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NI	28	59	2.52053E+12	4.90033E-19	4.90020E-19	4.90012E-19	4.89990E-19	4.89948E-19	4.89905E-19	4.89778E-19	4.89608E-19
NI	28	63	2.90020E+09	7.67915E-17	7.50735E-17	7.39495E-17	7.12127E-17	6.60392E-17	6.12416E-17	4.88404E-17	3.61208E-17
NI	28	65	9.21738E+03	5.78654E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CU	29	64	4.62098E+04	1.26352E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RB	37	86	1.60972E+06	1.08586E-19	2.14428E-37	3.37510E-49	1.04913E-78	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	87	1.00799E+04	5.97279E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	89	4.50096E+06	3.32606E-18	1.54912E-24	9.30804E-29	2.60491E-39	2.04005E-60	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	90	8.86377E+08	8.72369E-23	8.10117E-23	7.71103E-23	6.81593E-23	5.32537E-23	4.16077E-23	1.98448E-23	7.39514E-24
SR	38	91	3.48315E+04	7.97555E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	92	9.75604E+03	3.89599E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	93	4.56095E+02	1.99587E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	89	1.56998E+01	7.57179E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	90	2.30281E+05	1.22078E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	91	5.09667E+06	8.84543E-19	2.26444E-24	4.23767E-28	2.03019E-37	4.65951E-56	1.06961E-74	0.00000E+00	0.00000E+00
Y	39	92	1.27448E+04	2.80758E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	94	1.12208E+03	6.75456E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	96	9.80406E+00	5.[illegible]9686E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	88	7.2[illegible]602E+06	1.32252E-21	1.46713E-25	3.38722E-28	8.67552E-35	5.69083E-48	3.73298E-61	0.00000E+00	0.00000E+00
ZR	40	89	2.82249E+05	1.51849E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	93	4.74758E+13	2.69723E-21	2.69723E-21	2.69722E-21	2.69722E-21	2.69721E-21	2.69719E-21	2.69716E-21	2.69711E-21
ZR	40	95	5.63534E+06	1.33711E-17	1.17197E-22	4.98216E-26	1.85639E-34	2.57725E-51	3.57802E-68	0.00000E+00	0.00000E+00
ZR	40	97	6.04840E+04	2.25768E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	91	2.20888E+10	5.85951E-23	5.84213E-23	5.83057E-23	5.80177E-23	5.74460E-23	5.68799E-23	5.52150E-23	5.30706E-23
NB	41	92	6.00746E+05	2.32126E-18	1.01751E-50	2.72527E-72	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	94	6.30134E+11	3.86308E-19	3.86267E-19	3.86241E-19	3.86174E-19	3.86040E-19	3.85906E-19	3.85504E-19	3.84969E-19
NB	41	95	3.02684E+06	2.60034E-19	1.01421E-28	5.35921E-35	1.08783E-50	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	96	8.28132E+04	5.31160E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	97	4.33217E+03	4.86013E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	98	3.06025E+03	1.55416E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	100	3.09996E+00	1.09771E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	93	2.84077E+11	3.48545E-21	3.48464E-21	3.48410E-21	3.48276E-21	3.48008E-21	3.47[illegible]E-21	3.46938E-21	3.45871E-21
MO	42	99	2.41515E+05	4.10498E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	101	8.76292E+02	1.98319E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	104	2.61565E+02	1.20179E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	106	7.84813E+03	6.07913E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PD	46	107	2.05134E+14	2.35939E-27	2.35939E-27	2.35939E-27	2.35938E-27	2.35938E-27	2.35938E-27	2.35937E-27	2.35936E-27
PD	46	109	4.83704E+04	6.18028E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	106	7.34422E+05	2.79049E-20	4.37043E-59	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	108	4.10389E+09	3.74393E-17	3.68454E-17	3.64547E-17	3.54960E-17	3.36536E-17	3.19068E-17	2.71918E-17	2.19708E-17
AG	47	110	2.15826E+07	6.31435E-15	3.01892E-16	3.976[illegible]9E-17	2.50461E-19	9.93462E-24	3.94057E-28	2.45918E-41	6.08725E-59
CD	48	109	3.99508E+07	5.87279E-21	9.81493E-22	3.28[illegible]32E-22	2.12511E-23	8.90250E-26	3.72947E-28	2.74184E-35	8.44444E-45
CD	48	111	2.92221E+03	1.29176E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	115	1.92541E+05	4.14329E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	117	1.22399E+04	1.26788E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	119	5.97541E+02	7.11299E-25	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	111	2.42444E+05	1.9[illegible]501E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	112	1.25400E+03	1.02675E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	114	4.27869E+06	1.82006E-21	3.97480E-28	1.44147E-32	1.14164E-43	7.16066E-66	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	115	1.61497E+04	2.05289E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	116	1.40998E+01	9.56203E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	117	6.95931E+03	1.32773E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	118	2.63955E+02	5.03568E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	119	1.26027E+02	5.01670E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	120	4.40093E+01	1.13408E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	122	1.00998E+01	1.55397E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	113	9.94473E+06	4.78949E-18	6.52399E-21	8.[illegible]1672E-23	1.34188E-27	3.75943E-37	1.05327E-46	2.31623E-75	0.00000E+00
SN	50	121	9.72156E+04	2.36483E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	123	1.07967E+07	3.43852E-17	7.88375E-20	1.37080E-21	5.46496E-26	8.68540E-35	1.38036E-43	5.54125E-70	0.00000E+00
SN	50	125	8.12599E+05	4.24047E-16	3.59399E-51	1.49400E-74	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00

I	53	130	4.44981E+04	4.52882E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
XE	54	133	4.56018E+05	2.10016E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	132	5.50990E+05	2.21204E-18	2.29682E-69	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	134	6.47801E+07	1.04706E-14	6.70720E-15	3.41388E-15	6.30981E-16	2.15551E-17	7.36349E-19	2.93556E-23	3.99784E-29
EU	63	152	4.17559E+08	1.61731E-13	1.58210E-13	1.24463E-13	9.57823E-14	5.67255E-14	3.35946E-14	6.97825E-15	8.58450E-16
EU	63	154	2.69812E+08	1.61796E-14	1.26864E-14	1.07875E-14	7.19247E-15	3.19734E-15	1.42135E-15	1.24863E-16	4.87616E-18
LU	71	174	1.22687E+07	9.07073E-25	4.31240E-27	1.21928E-28	1.63896E-32	2.96139E-40	5.35075E-48	3.15631E-71	0.00000E+00
LU	71	177	1.38242E+07	4.15554E-22	3.60643E-24	1.52304E-25	5.58212E-29	7.49836E-36	1.00724E-42	2.44130E-63	0.00000E+00
HF	72	173	8.49653E+04	1.03070E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	175	6.04040E+06	9.97251E-16	1.93600E-20	1.39853E-23	1.96132E-31	3.85724E-47	7.58590E-63	0.00000E+00	0.00000E+00
HF	72	178	9.78261E+08	3.75104E-23	3.50842E-23	3.35498E-23	3.00010E-23	2.39898E-23	1.91831E-23	9.80826E-24	4.01011E-24
HF	72	179	1.89304E+10	1.77554E-24	1.76940E-24	1.76532E-24	1.75515E-24	1.73500E-24	1.71507E-24	1.65666E-24	1.58187E-24
HF	72	180	1.98723E+04	3.82661E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	181	3.66357E+06	7.16269E-15	1.10779E-22	7.73852E-28	8.38431E-41	9.04116E-67	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	182	2.84077E+14	1.89183E-29	1.89183E-29	1.89183E-29	1.89183E-29	1.89183E-29	1.89182E-29	1.89182E-29	1.89181E-29
TA	73	180	2.93458E+04	4.79751E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TA	73	182	9.89362E+06	1.16254E-16	1.53049E-17	1.83842E-19	2.90729E-24	7.27036E-34	1.81812E-43	2.84335E-72	0.00000E+00
W	74	181	1.20968E+07	3.57399E-18	1.57676E-20	4.23241E-22	5.01220E-26	7.02904E-34	9.85749E-42	2.71875E-65	0.[illegible]E+00
W	74	185	6.47801E+06	5.37823E-16	2.14408E-20	2.50212E-23	1.16410E-30	2.51955E-45	5.45331E-60	0.00000E+00	0.00000E+00
W	74	187	8.59984E+04	1.05853E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	203	4.02525E+06	1.33201E-20	1.10754E-27	2.10987E-32	3.34209E-44	8.38501E-68	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	205	3.11947E+02	1.04961E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	204	1.19282E+08	1.34751E-22	7.77332E-23	5.38671E-23	2.15336E-23	3.44114E-24	5.49906E-25	2.24412E-27	1.46348E-30
TL	81	206	2.52054E+02	2.40366E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	207	2.86188E+02	1.94395E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	203	1.86782E+05	5.36373E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	205	4.76390E+14	2.44352E-23	2.44352E-23	2.44352E-23	2.44352E-23	2.44351E-23	2.44351E-23	2.44351E-23	2.44351E-23
PB	82	207	7.959[illegible]E-01	5.31096E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TOTAL (CURIES/CC)				8.92076E-11	3.95824E-12	2.42096E-12	7.81067E-13	1.57883E-13	6.91544E-14	1.50156E-14	4.52941E-15
TOTAL (CURIES)				5.20972E-03	2.31161E-04	1.41384E-04	4.56143E-05	9.22038E-06	4.03861E-06	8.76911E-07	2.64518E-07

COMPONENT : CONCRETE - RADIAL EIGHTH 6 INCHES - R5
VOLUME : 5.99000E+07 CC
: ABOVE VOLUME IS FOR THE EIGHTH 6 INCHES OF CONCRETE
: IN THE RADIAL DIRECTION.
:
: (INTERVALS 82-84 TOTERBBS)

NUCLIDE SYM	Z	M	HALF-LIFE (SECONDS)	SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
				CONCENTRATION (CURIES/CC) AT TIME							
H	1	3	3.87233E+08	2.93095E-14	2.47407E-14	2.20977E-14	1.66604E-14	9.47020E-15	5.38313E-15	9.88692E-16	1.03220E-16
HE	2	6	8.09751E-01	2.92729E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
LI	3	8	8.40178E-01	7.76318E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	8	3.00064E-16	7.58052E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	10	7.88563E+13	2.15306E-24	2.15306E-24	2.15306E-24	2.15305E-24	2.15305E-24	2.15304E-24	2.15302E-24	2.15300E-24
B	5	12	1.99754E-02	1.07056E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
C	6	14	1.80970E+11	1.44347E-17	1.44294E-17	1.44259E-17	1.44172E-17	1.43990E-17	1.43826E-17	1.43304E-17	1.42612E-17
F	9	20	1.10023E+01	5.00075E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NE	10	23	3.76710E+01	5.96562E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NA	11	24	5.41521E+04	1.48171E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MG	12	27	5.68153E+02	2.87893E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AL	13	28	1.38629E+02	1.90429E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SI	14	31	9.43057E+03	9.83929E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	3.32385E-15	2.85521E-38	1.19757E-53	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
S	16	35	7.60030E+06	1.90689E-15	3.39280E-19	1.97320E-21	6.04103E-28	1.91375E-40	6.06259E-53	0.00000E+00	0.00000E+00
S	16	37	3.04012E+02	2.81706E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CL	17	36	9.77641E+12	1.40279E-18	1.40278E-18	1.40278E-18	1.40276E-18	1.40273E-18	1.40270E-18	1.40260E-18	1.40248E-18
AR	18	37	3.02684E+06	1.09656E-13	4.21208E-23	2.22573E-29	4.51785E-45	1.86126E-76	0.00000E+00	0.00000E+00	0.00000E+00
AR	18	39	8.48405E+09	3.656[illegible]E-16	3.62851E-16	3.60985E-16	3.56361E-16	3.47291E-16	3.38451E-16	3.13259E-16	2.82563E-16
AR	18	41	6.60140E+03	1.36533E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
K	19	40	4.10146E+16	1.87909E-21	1.87909E-21	1.87709E-21	1.87909E-21	1.87909E-21	1.87909E-21	1.87909E-21	1.87909E-21
K	19	42	4.47192E+04	5.10685E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CA	20	41	2.52055E+12	3.99639E-16	3.99629E-16	3.99622E-16	3.99605E-16	3.99570E-16	3.99535E-16	3.99432E-16	3.99293E-16
CA	20	45	1.42623E+07	1.57685E-13	1.58329E-15	7.36096E-17	3.64369E-20	7.52057E-27	1.64261E-33	1.71068E-53	0.00000E+00
CA	20	47	3.91608E+05	7.96606E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	46	7.25049E+06	2.08904E-14	2.45152E-18	5.87464E-21	1.65165E-27	1.30499E-40	1.03119E-53	0.00000E+00	0.00000E+00
SC	21	47	2.96217E+05	1.84643E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	48	1.58253E+05	6.83200E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	49	3.44049E+03	2.30734E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	50	1.03147E+02	1.30936E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	3.48315E+02	2.29110E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	49	2.85246E+07	2.20179E-20	2.20628E-21	4.75974E-22	1.02094E-23	4.60645E-27	2.24710E-30	2.29332E-40	1.89376E-53
V	23	52	2.02084E+02	6.04605E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	53	1.19922E+02	1.55109E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	54	5.50117E+01	2.34025E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39043E+06	9.73055E-15	1.27542E-26	1.52755E-34	2.39813E-54	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	1.27229E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	1.64225E-23	1.64225E-23	1.64224E-23	1.64224E-23	1.64224E-23	1.64224E-23	1.64223E-23	1.64222E-23
MN	25	54	2.61565E+07	1.37509E-14	1.11082E-15	2.10079E-16	3.20946E-18	7.49093E-22	1.74835E-25	2.22291E-36	6.59654E-51
MN	25	56	9.29152E+03	1.39154E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.619[illegible]E+02	2.44089E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.601[illegible]	3.08005E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.000[illegible]	0.00000E+00	0.00000E+00
FE	26	55	8.202[illegible]E+07	1.73713E-12	7.80556E-13	4.57915E-13	1.20700E-13	8.38763E-15	5.8[illegible]	1.95546E-19	4.55894E-24
FE	26	59	3.89[illegible]E+06	2.13718E-14	1.02617E-21	1.35561E-26	8.59085E-39	3.45[illegible]E-63	[illegible]E+00	0.00000E+00	0.00000E+00
FE	26	60	3.15569E+12	3.83530E-29	3.83522E-29	3.83516E-29	3.83503E-29	3.83476E-29	3.83450E-2[illegible]	3.83370E-29	3.83264E-29
FE	26	61	3.60001E+02	4.79207E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+[illegible]	0.00000E+00	0.00000E+00
CO	27	57	2.34036E+07	1.51041E-19	9.20565E-21	1.44132E-21	1.36816E-23	1.23278E-27	1.11070E-[illegible]1	8.12585E-44	5.35617E-60
CO	27	58	6.13605E+06	3.95661E-17	8.93778E-22	7.14231E-25	1.28930E-32	4.20118E-48	1.36895E-63	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	4.08296E-14	2.74962E-14	2.11255E-14	1.09305E-14	2.92622E-15	7.83382[illegible]-16	1.50305E-17	7.72042E-20
CO	27	61	5.94007E+03	3.94931E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.0[illegible]E+00	0.00000E+00	0.00000E+00
CO	27	62	8.36013E+02	7.14638E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.0000[illegible]E+00	0.00000E+00	0.00000E+00

CO	27	64	2.99999E-01	1.31138E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NI	28	59	2.52053E+12	1.07880E-19	1.07877E-19	1.07875E-19	1.07871E-19	1.07861E-19	1.07852E-19	1.07824E-19	1.07786E-19
NI	28	63	2.90020E+09	1.70074E-17	1.66269E-17	1.63780E-17	1.57719E-17	1.46261E-17	1.35635E-17	1.08170E-17	7.99986E-18
NI	28	65	9.21738E+03	1.38602E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CU	29	64	4.62098E+04	2.78307E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RB	37	86	1.60972E+06	2.65608E-20	5.24506E-38	8.25574E-50	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	87	1.00799E+04	1.45549E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	89	4.50096E+06	8.01992E-19	3.73529E-25	2.24439E-29	6.28105E-40	4.91905E-61	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	90	8.86377E+08	2.11989E-23	1.96861E-23	1.87381E-23	1.65629E-23	1.29408E-23	1.01108E-23	4.82238E-24	1.79705E-24
SR	38	91	3.48315E+04	1.94331E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	92	9.75604E+03	9.54540E-24	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	93	4.50095E+02	4.89368E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	89	1.56998E+01	1.85567E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	90	2.30281E+05	2.68745E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	91	5.09667E+06	2.14085E-19	5.48061[illegible]E-25	1.02564E-28	4.91365E-38	1.12774E-56	2.54820[illegible]E-75	0.00000E+00	0.00000E+00
Y	39	92	1.27440E+04	6.82770E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	94	1.12200E+03	1.52853E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	96	9.80406E+00	1.44646E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	88	7.20602E+06	3.18402E-22	3.55217E-26	8.15489E-29	2.08867E-35	1.37009E-48	8.98732E-62	0.00000E+00	0.00000E+00
ZR	40	89	2.82249E+05	3.68572E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	93	4.74758E+13	5.96187E-22	5.96186E-22	5.96185E-22	5.96184E-22	5.96181E-22	5.96179E-22	5.96170E-22	5.96159E-22
ZR	40	95	5.63534E+06	3.27949E-18	2.87444E-23	1.22196E-26	4.55309E-35	6.32112E-52	8.77570E-69	0.00000E+00	0.00000E+00
ZR	40	97	6.04840E+04	5.18945E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	91	2.20888E+10	1.43422E-23	1.42996E-23	1.42714E-23	1.42009E-23	1.40609E-23	1.39224E-23	1.35148E-23	1.29400E-23
NB	41	92	8.80746E+05	5.65903E-19	2.48059E-51	6.64396E-73	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	94	6.30134E+11	8.58710E-20	8.58620E-20	8.58560E-20	8.58411E-20	8.58114E-20	8.57816E-20	8.56923E-20	8.55734E-20
NB	41	95	3.02684E+06	6.38315E-20	2.45189E-29	1.29561E-35	2.62988E-51	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	96	8.28132E+04	1.29110E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	97	4.33217E+03	1.17795E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	98	3.06025E+03	3.79519E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	100	3.04994E+00	2.69207E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	93	2.84077E+11	8.00540E-22	8.00356E-22	8.00232E-22	7.99924E-22	7.99308E-22	7.98693E-22	7.96850E-22	7.94400E-22
MO	42	99	2.41515E+05	9.28563E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	101	8.76292E+02	4.46925E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	104	2.61565E+02	2.93071E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	106	7.84813E+03	1.46932E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PD	46	107	2.05134E+14	5.71875E-28	5.71874E-28	5.71874E-28	5.71874E-28	5.71873E-28	5.71873E-28	5.71871E-28	5.71868E-28
PD	46	109	4.83704E+04	1.49722E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	106	7.34472E+05	6.84513E-21	1.07208E-59	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	108	4.10389E+09	8.27456E-18	8.14330E-18	8.05695E-18	7.84507E-18	7.43787E-18	7.05180E-18	6.00974E-18	4.85582E-18
AG	47	110	2.15826E+07	1.40874E-15	6.73526E-17	8.87229E-18	5.58782E-20	2.21643E-24	8.79147E-29	5.48646E-42	1.35808E-59
CD	48	109	3.99508E+07	1.22820E-21	2.37634E-22	7.94942E-23	5.14521E-24	2.15543E-26	9.02962E-29	6.63840E-36	2.04453E-45
CD	48	111	2.92221E+03	3.13835E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	115	1.92541E+05	1.01341E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	117	1.22399E+04	3.11011E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	119	5.97541E+02	1.74483E-25	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	111	2.42444E+05	4.73546E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	112	1.25400E+03	2.48617E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	114	4.27069E+06	4.41833E-22	[illegible].64912E-29	[illegible].49926E-33	2.77142E-44	1.73830E-66	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	115	1.61497E+04	4.97219E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	116	1.40998E+01	2.32892E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	117	6.95931E+03	3.21928E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	118	2.63955E+02	1.23071E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	119	1.26027E+02	1.21876E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	120	4.40093E+01	2.78132E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	122	1.00998E+01	3.81193E-24	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	113	9.94473E+06	1.10038E-18	1.49888E-21	1.84183E-23	3.08294E-28	8.63723E-38	2.41987E-47	5.32151E-76	0.00000E+00
SN	50	121	9.72156E+04	5.25236E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	123	1.07967E+07	7.67271E-18	1.75918E-20	3.05880E-22	1.21945E-26	1.93806E-35	3.08014E-44	1.23648E-70	0.00000E+00
SN	50	125	8.12599E+05	9.41941E-17	7.98337E-52	3.31863E-75	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
I	53	130	4.44981E+04	1.09470E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
XE	54	133	4.56018E+05	5.06628E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	132	5.58990E+05	5.42620E-19	5.63418E-70	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	134	6.47801E+07	4.11418E-15	1.49398E-15	7.60415E-16	1.40546E-16	4.80122E-18	1.64016E-19	6.53872E-24	8.90487E-30
EU	63	152	4.17559E+08	3.55871E-14	3.04116E-14	2.73066E-14	2.10758E-14	1.24818E-14	7.39212E-15	1.53548E-15	1.88892E-16
EU	63	154	2.69812E+08	3.57219E-15	2.80097E-15	2.38172E-15	1.58798E-15	7.05923E-16	3.13811E-16	2.75678E-17	1.07658E-18
LU	71	174	1.22687E+07	2.16378E-25	1.02878E-27	2.90894E-29	3.90967E-33	7.06425E-41	1.27640E-48	7.52924E-72	0.00000E+00
LU	71	177	1.38242E+07	1.00634E-22	8.73362E-25	3.68832E-26	1.35181E-29	1.81586E-36	2.43921E-43	5.91225E-64	0.00000E+00
HF	72	173	8.49653E+04	2.52834E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	175	6.04840E+06	2.20315E-16	4.27724E-21	3.08967E-24	4.33298E-32	8.52151E-48	1.67589E-63	0.00000E+00	0.00000E+00
HF	72	178	9.78261E+08	9.11456E-24	8.52321E-24	8.15045E-24	7.28831E-24	5.82798E-24	4.66025E-24	2.38277E-24	9.74198E-25
HF	72	179	1.89384E+10	4.30567E-25	4.29078E-25	4.28088E-25	4.25622E-25	4.20735E-25	4.15903E-25	4.01739E-25	3.83661E-25
HF	72	180	1.98723E+04	9.30234E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	181	3.66357E+06	1.59169E-15	2.64688E-23	1.72446E-28	1.86837E-41	2.19302E-67	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	182	2.84077E+14	4.60598E-30	4.60598E-30	4.60598E-30	4.60598E-30	4.60598E-30	4.60597E-30	4.60596E-30	4.60595E-30
TA	73	180	2.93458E+04	1.17621E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TA	73	182	9.89362E+06	2.60673E-15	3.43176E-18	4.12222E-20	6.51893E-25	1.63021E-34	4.07671E-44	6.37554E-73	0.00000E+00
W	74	181	1.20968E+07	8.76696E-19	3.86287E-21	1.93621E-22	1.22949E-26	1.72422E-34	2.41802E-42	6.66906E-66	0.00000E+00
W	74	185	6.47801E+06	1.19904E-16	4.78010E-21	5.57833E-24	2.59529E-31	5.61717E-46	1.21578E-60	0.00000E+00	0.00000E+00
W	74	187	8.59986[illegible]E+04	2.35903E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	203	4.02525E+06	3.24543E-21	2.69851E-28	5.14069E-33	8.14299E-45	2.04300E-68	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	205	3.11947E+02	2.56807E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	204	1.19282E+08	3.27608E-23	1.88986E-23	1.30963E-23	5.23529E-24	8.36616E-25	1.33694E-25	5.45593E-28	3.55904E-31
TL	81	206	2.52054E+02	5.86284E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	207	2.86188E+02	4.73063E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	203	1.86782E+05	1.31573E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	205	4.76390E+14	5.99283E-24	5.99283E-24	5.99283E-24	5.99282E-24	5.99282E-24	5.99282E-24	5.99281E-24	5.99280E-24
PB	82	207	7.95989E-01	1.30161E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
			TOTAL (CURIES/CC)	1.96956E-11	8.71078E-13	5.32760E-13	1.71902E-13	3.47615E-14	1.52360E-14	3.31242E-15	1.00384E-15
			TOTAL (CURIES)	1.17977E-03	5.21776E-05	3.19123E-05	1.02969E-05	2.08221E-06	9.12277E-07	1.98414E-07	6.01298E-08

COMPONENT : CONCRETE - AXIAL UP - FIRST 6 INCHES - RS
VOLUME : 1.44000E+07 CC
: ABOVE VOLUME IS FOR THE FIRST 6 INCHES OF CONCRETE
: IN THE AXIAL UP DIRECTION.
:
: (INTERVALS 46-48 TOTGUPRS)

NUCLIDE SYM	Z	N	HALF-LIFE (SECONDS)	CONCENTRATION (CURIES/CC) AT TIME SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
H	1	3	3.87233E+08	2.33577E-07	1.97166E-07	1.76104E-07	1.32772E-07	7.54712E-08	4.28999E-08	7.87921E-09	8.22590E-10
HE	2	6	8.09751E-01	2.09635E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
LI	3	8	8.40178E-01	6.17731E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	8	3.00064E-16	5.70959E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	10	7.88563E+13	3.78577E-18	3.78577E-18	3.78577E-18	3.78576E-18	3.78575E-18	3.78574E-18	3.78571E-18	3.78567E-18
B	5	12	1.99754E-02	8.54753E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
C	6	14	1.80970E+11	1.14335E-10	1.14293E-10	1.14256E-10	1.14197E-10	1.14059E-10	1.13921E-10	1.13509E-10	1.12961E-10
F	9	20	1.10023E+01	1.82153E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NE	10	23	3.76710E+01	2.79365E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NA	11	24	5.41521E+04	1.17835E-05	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MG	12	27	5.68153E+02	1.46665E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AL	13	28	1.38629E+02	1.28141E-05	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SI	14	31	9.43057E+03	6.10904E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	3[illegible]	1.2[illegible]56E+06	2.19126E-09	1.88230E-32	7.89504E-48	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
S	16	[illegible]	7.600[illegible]E+06	1.47774E-08	2.62924E-12	8.31736E-15	4.68148E-21	1.48305E-33	4.69818E-46	0.00000E+00	0.00000E+00
S	16	3[illegible]	3.04012E+02	1.27970E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CL	17	36	9.77641E+12	1.11725E-11	1.11724E-11	1.11724E-11	1.11723E-11	1.11720E-11	1.11718E-11	1.11710E-11	1.11700E-11
AR	18	37	3.02684E+06	5.94718E-08	2.28442E-17	1.20712E-23	2.45026E-39	1.00945E-78	0.00000E+00	0.00000E+00	0.00000E+00
AR	18	39	8.48405E+09	1.85968E-09	1.84535E-09	1.83586E-09	1.81234E-09	1.76621E-09	1.72126E-09	1.59314E-09	1.43703E-09
AR	18	41	6.60140E+03	6.97879E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
K	19	4[illegible]	4.10146E+16	1.50191E-14	1.50191E-14	1.50191E-14	1.50191E-14	1.50191E-14	1.50191E-14	1.50191E-14	1.50191E-14
[illegible]	19	42	4.47192E+04	4.1[illegible]84E-07	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CA	20	41	2.52053E+12	3.11[illegible]77E-09	3.11869E-09	3.11864E-09	3.11850E-09	3.11823E-09	3.11796E-09	3.11716E-09	3.11607E-09
CA	20	45	1.4[illegible]523E+07	1.256[illegible]4E-06	1.26116E-08	5.86972E-10	2.74306E-13	5.99049E-20	1.30825E-26	1.36264E-46	3.09951E-73
CA	20	47	3.91608E+05	6.216[illegible]9E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	46	7.25049E+06	1.700[illegible]6E-07	1.99534E-11	4.78151E-14	1.34415E-20	1.06216E-33	8.39310E-47	0.00000E+00	0.00000E+00
SC	21	47	2.96217E+05	1.275[illegible]1E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	48	1.58253E+05	2.[illegible]5E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	49	3.44849E+03	1.2[illegible]8E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	50	1.03147E+02	4.[illegible]83E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	3.48315E+02	[illegible].52528E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	49	2.85246E+07	7.28209E-15	7.29694E-16	1.57421E-16	3.40309E-18	1.59033E-[illegible]1	7.43198E-25	7.58482E-35	3.61747E-48
V	23	52	2.02084E+02	4.80137E-07	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	53	1.19922E+02	6.82972E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	54	5.50117E+01	7.75842E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39843E+06	7.76890E-08	1.01830E-19	1.21960E-27	1.91467E-47	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	6.57113E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	5.43160E-18	5.43159E-18	5.43159E-18	5.43159E-18	5.43158E-18	5.43157E-18	5.43154E-18	5.431[illegible]9E-18
MN	25	54	2.61565E+07	8.62749E-09	7.01962E-10	1.31806E-10	2.01365E-12	4.69989E-16	1.09693E-19	1.39460E-30	4.13874E-45
MN	25	56	9.29152E+03	1.14604E-04	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	1.15254E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	1.31544E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	1.35[illegible]78E-05	6.[illegible]9649E-06	3.57652E-06	9.42785E-07	6.55111E-08	4.55216E-09	1.52730E-12	3.56073E-17
FE	26	59	3.89409E+06	1.[illegible]622E-07	8.[illegible]8057E-15	1.12031E-19	7.10632E-32	2.85907E-56	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	60	3.15569E+1[illegible]	1.27[illegible]6E-23	1.27323E-23	1.27321E-23	1.27317E-23	1.27308E-23	1.27299E-23	1.272[illegible]3E-23	1.27238E-23
FE	26	61	3.60001E+02	1.5856[illegible]E-1[illegible]	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	57	2.34838E+07	5.03179E-14	3.07713E-15	4.77634E-16	4.53309E-18	4.08524E-22	3.68097E-26	2.69280E-38	1.77496E-54
CO	27	58	6.13405E+06	2.60777E-11	5.89082E-16	4.70744E-19	8.49767E-27	2.76897E-42	9.02267E-58	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	3.47232E-07	2.33841E-07	1.79661E-07	9.29581E-08	2.48859E-08	6.66224E-09	1.27826E-10	6.56581E-13
CO	27	61	5.94007E+03	2.04156E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	62	8.34012E+02	8.30689E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	64	2.99999E-01	4.33865E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NI	28	59	2.52053E+12	8.63586E-13	8.63563E-13	8.63548E-13	8.63511E-13	8.63436E-13	8.63361E-13	8.63136E-13	8.62837E-13
NI	28	63	2.90020E+09	1.21284E-10	1.18492E-10	1.16718E-10	1.12398E-10	1.04233E-10	9.66605E-11	7.70872E-11	5.70111E-11
NI	28	65	9.21738E+03	7.15201E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CU	29	64	4.62098E+04	2.25113E-07	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RB	37	86	1.60972E+06	9.16550E-15	1.80994E-32	2.84886E-44	8.85547E-74	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	87	1.00799E+04	5.31947E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	89	4.50096E+06	3.66145E-13	1.70532E-19	1.02466E-23	2.86757E-34	2.24576E-55	1.75876E-76	0.00000E+00	0.00000E+00
SR	38	90	8.86377E+08	8.22011E-18	7.63353E-18	7.26591E-18	6.42248E-18	5.01796E-18	3.92059E-18	1.86993E-18	6.96826E-19
SR	38	91	3.48315E+04	7.11345E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	92	9.75604E+03	3.21547E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	93	4.50095E+02	1.62985E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	89	1.56998E+01	6.25214E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	90	2.30281E+05	2.14504E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	91	5.09667E+06	9.09308E-14	2.32784E-19	4.35632E-25	2.08703E-32	4.78996E-51	1.09935E-69	0.00000E+00	0.00000E+00
Y	39	92	1.27440E+04	2.59704E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	94	1.12200E+03	5.34819E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	96	9.80406E+00	4.78567E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	88	7.20602E+06	1.45275E-16	1.61160E-20	3.72077E-23	9.52982E-30	6.25122E-43	4.10057E-56	0.00000E+00	0.00000E+00
ZR	40	89	2.82249E+05	1.47329E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	93	4.74758E+13	4.67238E-15	4.67238E-15	4.67237E-15	4.67236E-15	4.67234E-15	4.67232E-15	4.67225E-15	4.67217E-15
ZR	40	95	5.63534E+06	1.08717E-12	9.52899E-18	4.05088E-21	1.50939E-29	2.09550E-46	2.90921E-63	0.00000E+00	0.00000E+00
ZR	40	97	6.04840E+04	9.22658E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	91	2.20888E+10	4.90162E-18	4.88708E-18	4.87761E-18	4.85332E-18	4.80550E-18	4.75814E-18	4.61887E-18	4.43948E-18
NB	41	92	8.80746E+05	2.12035E-13	9.29442E-46	2.48939E-67	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	94	6.30134E+11	8.52721E-13	8.52633E-13	8.52573E-13	8.52426E-13	8.52130E-13	8.51834E-13	8.50947E-13	8.49767E-13
NB	41	95	3.02694E+06	2.77272E-14	1.06505E-23	5.62790E-30	1.14237E-45	4.70632E-77	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	96	8.28132E+04	4.99133E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	97	4.33217E+03	4.85563E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	98	3.06025E+03	1.34337E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	100	5.09994E+00	8.93576E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	93	2.84077E+11	1.03616E-14	1.03592E-14	1.03576E-14	1.03536E-14	1.03456E-14	1.03377E-14	1.03138E-14	1.02821E-14
MO	42	99	2.41515E+05	1.14675E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	101	8.76292E+02	5.47831E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	104	2.61565E+02	1.06414E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	106	7.84813E+03	6.17400E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PD	46	107	2.05134E+14	2.37310E-22	2.37310E-22	2.37309E-22	2.37309E-22	2.37309E-22	2.37309E-22	2.37308E-22	2.37307E-22
PD	46	109	4.83704E+04	6.29007E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	106	7.34422E+05	2.26393E-15	3.54575E-54	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	108	4.10389E+09	7.41023E-11	7.29268E-11	7.21535E-11	7.02560E-11	6.66093E-11	6.31520E-11	5.38198E-11	4.34860E-11
AG	47	110	2.15826E+07	1.63824E-08	7.83249E-10	1.03177E-10	6.49813E-13	2.57750E-17	1.02237E-21	6.38025E-35	1.57932E-52
CD	48	109	3.99508E+07	5.18668E-16	1.00353E-16	3.35703E-17	2.17282E-18	9.10236E-21	3.81320E-23	2.80339E-30	8.63402E-40
CD	48	111	2.92221E+03	1.22882E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	115	1.92541E+05	3.50533E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	117	1.22399E+04	1.02878E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	119	5.97541E+02	5.77080E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	111	2.42444E+05	1.63251E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	112	1.25400E+03	1.05002E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	114	4.27869E+06	1.76505E-16	3.85465E-23	1.39790E-27	1.10713E-38	6.94422E-61	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	115	1.61497E+04	2.09367E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	116	1.40998E+01	8.61862E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	117	6.95931E+03	1.31988E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	118	2.63955E+02	4.30383E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	119	1.26027E+02	4.77393E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	120	4.40093E+01	9.22973E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	122	1.00998E+01	1.26074E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	113	9.94473E+06	1.54783E-11	2.10838E-14	2.59079E-16	4.33658E-21	1.21495E-30	3.40388E-40	7.48545E-69	0.00000E+00
SN	50	121	9.72156E+04	4.92008E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	123	1.07967E+07	6.61381E-11	1.51640E-13	2.63666E-15	1.05116E-19	1.67059E-28	2.65505E-37	1.06583E-63	0.00000E+00
SN	50	125	8.12599E+05	9.48088E-10	8.04225E-45	3.34311E-68	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00

I	53	130	4.44981E+04	4.47155E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
XE	54	133	4.56018E+05	2.33476E-14	7.44909E-77	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	132	5.58990E+05	1.79464E-13	1.86343E-64	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	134	6.47801E+07	4.57422E-08	1.66103E-08	8.45442E-09	1.56261E-09	5.33809E-11	1.82356E-12	7.26986E-17	9.90060E-23
EU	63	152	4.17559E+08	2.80632E-07	2.39820E-07	2.15965E-07	1.66199E-07	9.84288E-08	5.82927E-08	1.21085E-08	1.48956E-09
EU	63	154	2.69812E+08	3.11396E-08	2.46167E-08	2.07620E-08	1.38428E-08	6.15369E-09	2.73556E-09	2.40314E-10	9.38478E-12
LU	71	174	1.22687E+07	1.23289E-19	5.86141E-22	1.65724E-23	2.22767E-27	4.02511E-35	7.27273E-43	4.29005E-66	0.00000E+00
LU	71	177	1.38242E+07	4.27605E-17	3.71102E-19	1.56721E-20	5.74400E-24	7.71581E-31	1.03645E-37	2.51218E-58	0.00000E+00
HF	72	173	8.49653E+04	8.36212E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	175	6.04840E+06	1.95150E-09	3.70868E-14	2.73676E-17	3.83806E-25	7.54817E-41	1.40447E-56	0.00000E+00	0.00000E+00
HF	72	178	9.78261E+08	3.60207E-16	3.36837E-18	3.22105E-18	2.88034E-18	2.30322E-18	1.84173E-18	9.41672E-19	3.85003E-19
HF	72	179	1.89304E+10	1.77093E-19	1.76481E-19	1.76074E-19	1.75060E-19	1.73049E-19	1.71062E-19	1.65236E-19	1.57776E-19
HF	72	180	1.98723E+04	3.60297E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	181	3.66357E+06	1.77214E-08	2.94695E-16	1.91997E-21	2.08019E-34	2.44164E-60	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	182	2.84077E+14	1.72511E-24	1.72511E-24	1.72511E-24	1.72511E-24	1.72511E-24	1.72511E-24	1.72510E-24	1.72510E-24
TA	73	180	2.93458E+04	3.92217E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TA	73	182	9.89362E+06	3.34305E-08	4.40113E-11	5.28662E-13	8.36033E-18	2.09069E-27	5.22826E-37	8.17644E-66	0.00000E+00
W	74	181	1.20968E+07	2.90028E-13	1.27791E-15	3.43458E-17	4.06737E-21	5.70404E-29	7.99927E-37	2.20625E-60	0.00000E+00
W	74	185	6.47801E+06	1.22773E-09	4.89445E-14	5.71178E-17	2.65738E-24	5.75155E-39	1.24487E-53	0.00000E+00	0.00000E+00
W	74	187	8.59984E+04	2.67822E-06	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	203	4.02525E+06	1.19089E-15	9.90200E-23	1.08634E-27	2.98801E-39	7.49665E-63	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	205	3.11947E+02	8.82886E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	204	1.19282E+08	1.27665E-17	7.36459E-18	5.10347E-18	2.04014E-18	3.26021E-19	5.20991E-20	2.12612E-22	1.38653E-25
TL	81	206	2.52054E+02	2.11713E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	207	2.86186E+02	1.77719E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	203	1.86782E+05	4.35221E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	205	4.76390E+14	1.98810E-18	1.98810E-18	1.98809E-18	1.98809E-18	1.98809E-18	1.98809E-18	1.98809E-18	1.98809E-18
PB	82	207	7.95989E-01	4.36448E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
			TOTAL (CURIES/CC)	1.56769E-04	6.82779E-06	4.18355E-06	1.35536E-06	2.75686E-07	1.20270E-07	2.53250E-08	7.10165E-09
			TOTAL (CURIES)	2.25748E+03	9.83201E+01	6.02432E+01	1.95172E+01	3.96988E+00	1.73189E+00	3.64680E-01	1.02264E-01

COMPONENT : CONCRETE - AXIAL UP - SECOND 6 INCHES - RS
VOLUME : 1.44000E+07 CC
: ABOVE VOLUME IS FOR THE SECOND 6 INCHES OF CONCRETE
: IN THE AXIAL UP DIRECTION.
:
: (INTERVALS 49-51 TOTGUPRS)

NUCLIDE SYM	Z	M	HALF-LIFE (SECONDS)	CONCENTRATION (CURIES/CC) AT TIME SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
H	1	3	3.87233E+08	5.98306E-08	5.05040E-08	4.51088E-08	3.40094E-08	1.93319E-08	1.09888E-08	2.01825E-09	2.10706E-10
HE	2	6	8.09751E-01	4.48562E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
LI	3	8	8.40170E-01	1.58148E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	8	3.00064E-16	1.18566E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	10	7.88563E+13	8.75338E-19	8.75337E-19	8.75337E-19	8.75336E-19	8.75333E-19	8.75331E-19	8.75323E-19	8.75314E-19
B	5	12	1.99754E-02	2.18235E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
C	6	14	1.80978E+11	2.92597E-11	2.92491E-11	2.92420E-11	2.92244E-11	2.91891E-11	2.91538E-11	2.90483E-11	2.89082E-11
F	9	20	1.10023E+01	4.41435E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NE	10	23	3.76710E+01	6.41322E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NA	11	24	5.41521E+04	2.98788E-06	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MG	12	27	5.68153E+02	3.31899E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AL	13	28	1.38629E+02	3.26143E-06	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SI	14	31	9.43057E+03	1.33810E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	4.79469E-10	4.11867E-33	1.72752E-48	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
S	16	35	7.60030E+06	3.83604E-09	6.82522E-13	2.15918E-15	1.21526E-21	3.84985E-34	1.21960E-46	0.00000E+00	0.00000E+00
S	16	37	3.04012E+02	2.95635E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CL	17	36	9.77641E+12	2.76932E-12	2.76930E-12	2.76928E-12	2.76925E-12	2.76919E-12	2.76913E-12	2.76894E-12	2.76870E-12
AR	18	37	3.02684E+06	1.33362E-08	5.12269E-18	2.70690E-24	5.49456E-40	2.26344E-71	0.00000E+00	0.00000E+00	0.00000E+00
AR	18	39	8.48405E+09	4.71409E-10	4.67777E-10	4.65371E-10	4.59411E-10	4.47717E-10	4.36321E-10	4.03845E-10	3.64272E-10
AR	18	41	6.60140E+03	1.57391E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
K	19	40	4.10146E+16	3.82701E-15	3.82701E-15	3.82701E-15	3.82701E-15	3.82701E-15	3.82701E-15	3.82701E-15	3.82701E-15
K	19	42	4.47192E+04	1.83149E-07	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CA	20	41	2.52053E+12	8.17132E-10	8.17111E-10	8.17097E-10	8.17061E-10	8.16990E-10	8.16919E-10	8.16707E-10	8.16423E-10
CA	20	45	1.42623E+07	3.17062E-07	3.18356E-09	1.48170E-10	6.92432E-14	1.51218E-20	3.30243E-27	3.43972E-47	7.82411E-74
CA	20	47	3.91608E+05	1.62851E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	46	7.25049E+06	4.20447E-08	4.93212E-12	1.18190E-14	3.32250E-21	2.62546E-34	2.07462E-47	0.00000E+00	0.00000E+00
SC	21	47	2.96217E+05	2.67256E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	48	1.58253E+05	6.35752E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	49	3.44849E+03	2.78294E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	50	1.03147E+02	1.07645E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	3.48315E+02	4.63606E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	49	2.85246E+07	1.80393E-15	1.80761E-16	3.89967E-17	8.43019E-19	3.93958E-22	1.84106E-25	1.87893E-35	8.96127E-49
V	23	52	2.02084E+02	1.22627E-07	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	53	1.19922E+02	1.58750E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	54	5.50117E+01	1.92089E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39843E+06	1.83794E-08	2.40907E-20	2.88529E-28	4.52967E-48	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	1.47968E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	1.34552E-18	1.34552E-18	1.34552E-18	1.34552E-18	1.34551E-18	1.34551E-18	1.34550E-18	1.34549E-18
MN	25	54	2.61565E+07	1.89771E-09	1.54404E-10	2.89920E-11	4.42924E-13	1.03379E-16	2.41282E-20	3.06775E-31	9.10360E-46
MN	25	56	9.29152E+03	2.80070E-05	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	2.63963E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	3.24038E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	3.54729E-06	1.59392E-06	9.35080E-07	2.46491E-07	1.71279E-08	1.19016E-09	3.99313E-13	9.30952E-18
FE	26	59	3.89409E+06	4.28863E-08	2.05920E-15	2.72027E-20	1.72551E-32	6.94222E-57	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	60	3.15569E+12	3.15142E-24	3.15135E-24	3.15131E-24	3.15120E-24	3.15098E-24	3.15076E-24	3.15011E-24	3.14923E-24
FE	26	61	3.60001E+02	3.92764E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	57	2.34838E+07	1.24592E-14	7.61930E-16	1.18267E-16	1.12264E-18	1.01155E-22	9.11448E-27	6.66764E-39	4.39499E-55
CO	27	58	6.13405E+06	5.61175E-12	1.26767E-16	1.01301E-19	1.82864E-27	5.95863E-43	1.94162E-58	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	8.12825E-08	5.47398E-08	4.20562E-08	2.17603E-08	5.82547E-09	1.55954E-09	2.99225E-11	1.53697E-13
CO	27	61	5.94087E+03	4.60358E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	62	8.34012E+02	1.98543E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00

CD	27	64	2.99999E-01	1.07470E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NI	28	59	2.52053E+12	2.19861E-13	2.19856E-13	2.19852E-13	2.19842E-13	2.19823E-13	2.19804E-13	2.19747E-13	2.19671E-13
NI	28	63	2.90020E+09	3.14583E-11	3.07545E-11	3.02941E-11	2.91729E-11	2.70536E-11	2.50882E-11	2.00079E-11	1.47972E-11
NI	28	65	9.21738E+03	1.60917E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CU	29	64	4.62098E+04	5.62585E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RB	37	86	1.60972E+06	2.24893E-15	4.44103E-33	6.99020E-45	2.17285E-74	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	87	1.00799E+04	1.28874E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	89	4.50096E+06	8.44024E-14	3.93106E-20	2.36201E-24	4.61024E-35	5.17685E-56	4.05423E-77	0.00000E+00	0.00000E+00
SR	38	90	8.86377E+08	1.96391E-18	1.82377E-18	1.73594E-18	1.53443E-18	1.19887E-18	9.36691E-19	4.46756E-19	1.66483E-19
SR	38	91	3.48315E+04	1.72280E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	92	9.75604E+03	7.93229E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	93	4.50095E+02	4.83107E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	89	1.56998E+01	1.54191E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	90	2.30281E+05	5.47267E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	91	5.09667E+06	2.12798E-14	5.44765E-20	1.01947E-23	4.88410E-33	1.12096E-51	2.57272E-70	0.00000E+00	0.00000E+00
Y	39	92	1.27440E+04	6.23369E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	94	1.12200E+03	1.30821E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	96	9.80406E+00	1.18542E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	88	7.20602E+06	3.35325E-17	3.71990E-21	8.58831E-24	2.19968E-30	1.44291E-43	9.46499E-57	0.00000E+00	0.00000E+00
ZR	40	89	2.82249E+05	3.49437E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	93	4.74758E+13	1.15932E-15	1.15931E-15	1.15931E-15	1.15931E-15	1.15930E-15	1.15930E-15	1.15928E-15	1.15926E-15
ZR	40	95	5.63534E+06	2.69171E-13	2.35926E-18	1.00295E-21	3.73705E-30	5.18820E-47	7.20285E-64	0.00000E+00	0.00000E+00
ZR	40	97	6.04840E+04	5.63266E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	91	2.20688E+10	1.20528E-18	1.20171E-18	1.19933E-18	1.19340E-18	1.18164E-18	1.17000E-18	1.13575E-18	1.09164E-18
NB	41	92	8.80746E+05	5.10235E-14	2.23650E-46	5.99040E-68	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	94	6.30134E+11	1.53392E-13	1.53376E-13	1.53365E-13	1.53339E-13	1.53285E-13	1.53232E-13	1.53073E-13	1.52860E-13
NB	41	95	3.02684E+06	6.46078E-15	2.48171E-24	1.31137E-30	2.66187E-46	1.09663E-77	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	96	8.28132E+04	1.19316E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	97	4.33217E+03	1.14372E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	98	3.06025E+03	3.27761E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	100	3.09994E+00	2.21176E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	93	2.84077E+11	4.61733E-16	4.61626E-16	4.61555E-16	4.61377E-16	4.61022E-16	4.60667E-16	4.59605E-16	4.58191E-16
MO	42	99	2.41515E+05	1.19384E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	101	8.76292E+02	6.33783E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	104	2.61565E+02	2.58088E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	106	7.84813E+03	1.45082E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PD	46	107	2.05134E+14	5.57914E-23	5.57914E-23	5.57914E-23	5.57914E-23	5.57913E-23	5.57913E-23	5.57911E-23	5.57909E-23
PD	46	109	4.83704E+04	1.47471E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	106	7.34422E+05	5.60826E-16	8.78359E-55	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	108	4.10389E+09	1.61592E-11	1.59029E-11	1.57342E-11	1.53205E-11	1.45252E-11	1.37713E-11	1.17363E-11	9.48282E-12
AG	47	110	2.15826E+07	2.52936E-09	1.20930E-10	1.59300E-11	1.00328E-13	3.97954E-18	1.57849E-22	9.85080E-36	2.43839E-53
CD	48	109	3.99508E+07	1.21502E-16	2.35083E-17	7.86408E-18	5.08997E-19	2.13229E-21	8.93269E-24	6.56714E-31	2.02258E-40
CD	48	111	2.92221E+03	2.92873E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	115	1.92541E+05	8.59551E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	117	1.22399E+04	2.54843E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	119	5.97541E+02	1.42955E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	111	2.42444E+05	4.00651E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	112	1.25400E+03	2.46038E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	114	4.27869E+06	4.18643E-17	9.14266E-24	3.31560E-28	2.62595E-39	1.64706E-61	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	115	1.61497E+04	4.90923E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	116	1.40998E+01	2.08165E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	117	6.95931E+03	3.11222E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	118	2.63955E+02	1.05286E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	119	1.26027E+02	1.13763E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	120	4.49093E+01	2.28465E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	122	1.00998E+01	3.12313E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	113	5.94473E+06	4.78467E-13	9.24173E-16	1.13563E-17	1.90087E-22	5.32552E-32	1.49203E-41	3.28112E-70	0.00000E+00
SN	50	121	5.72156E+04	9.31568E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	123	1.07967E+07	1.31728E-11	3.02023E-14	5.25146E-16	2.09360E-20	3.32733E-29	5.28809E-38	2.12283E-64	0.00000E+00
SN	50	125	8.12599E+05	1.72737E-10	1.46403E-45	6.08586E-69	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00

I	53	130	4.44981E+04	1.05887E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
XE	54	133	4.56018E+05	5.36792E-15	1.71264E-77	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	132	5.58990E+05	4.44571E-14	4.61612E-65	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	134	6.47801E+07	7.46694E-09	2.71146E-09	1.38010E-09	2.55081E-10	8.71388E-12	2.97677E-13	1.18673E-17	1.61617E-23
EU	63	152	4.17559E+08	7.28102E-08	6.22214E-[illegible]	5.60323E-08	4.31206E-08	2.55374E-08	1.51241E-08	3.14156E-09	3.86469E-10
EU	63	154	2.69812E+08	7.09288E-09	5.56[illegible]55E-09	4.72910E-09	3.15307E-09	1.40167E-09	6.23098E-10	5.47381E-11	2.13764E-12
LU	71	174	1.22687E+07	2.71974E-20	1.29302E-22	3.65586E-24	4.91622E-28	8.87934E-36	1.69435E-63	9.46380E-67	0.00000E+00
LU	71	177	1.38242E+07	9.99810E-18	8.67696E-20	3.66439E-21	1.34304E-24	1.80408E-31	2.42336E-3[illegible]	5.87390E-59	0.00000E+00
HF	72	173	8.49653E+04	2.07147E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	175	6.04840E+06	4.38736E-10	8.51771E-15	6.13278E-18	8.62872E-26	1.69698E-41	3.33738E-57	0.00000E+00	0.00000E+00
HF	72	178	9.78261E+08	8.56259E-19	8.00705E-19	7.65606E-19	6.84695E-19	5.47504E-19	4.37803E-19	2.23847E-19	9.15201E-20
HF	72	179	1.89384E+10	4.17198E-20	4.15755E-20	4.14795E-20	4.12407E-20	4.07671E-20	4.02989E-20	3.89265E-20	3.71690E-20
HF	72	180	1.98723E+04	8.60724E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	181	3.66357E+06	2.98508E-09	4.96400E-17	3.23409E-22	3.50397E-35	4.11282E-61	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	182	2.84077E+14	4.15392E-25	4.15392E-25	4.15392E-25	4.15392E-25	4.15391E-25	4.15391E-25	4.15390E-25	4.15389E-25
TA	73	180	2.93458E+04	9.69792E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TA	73	182	9.89362E+06	4.39996E-09	5.79256E-12	6.95799E-14	1.10035E-18	2.75167E-28	6.88118E-38	1.07614E-66	0.00000E+00
W	74	181	1.20968E+07	7.18418E-14	3.16547E-16	8.50769E-18	1.00752E-21	1.41293E-29	1.98147E-37	5.46504E-61	0.00000E+00
W	74	185	6.47801E+06	2.08634E-10	8.31739E-15	9.70633E-18	4.51583E-25	9.77391E-40	2.11547E-54	0.00000E+00	0.00000E+00
W	74	187	8.59984E+04	4.27593E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	203	4.02525E+06	2.88226E-16	2.39655E-23	4.56544E-28	7.23179E-40	1.81439E-63	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	205	3.11947E+02	2.16811E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	204	1.192[illegible]E+08	3.04423E-18	1.75612E-18	1.21694E-18	4.86478E-19	7.77408E-20	1.24232E-20	5.06981E-23	3.30623E-26
TL	81	206	2.52054E+02	5.14182E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	207	2.86188E+02	4.27785E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	203	1.86782E+05	1.07810E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	205	4.76390E+14	4.92150E-19	4.92150E-19	4.92150E-19	4.92150E-19	4.92150E-19	4.92149E-19	4.92149E-19	4.92148E-19
PB	82	207	7.95989E-01	1.07780E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
			TOTAL (CURIES/CC)	3.07804E-05	1.77449E-06	1.08594E-06	3.50143E-07	7.05716E-08	3.08103E-08	6.52936E-09	1.83650E-09
			TOTAL (CURIES)	5.58553E+02	2.55527E+01	1.56375E+01	5.04206E+00	1.01623E+00	4.43669E-01	9.49228E-02	2.64455E-02

COMPONENT : CONCRETE - AXIAL UP - THIRD 6 INCHES - RS
VOLUME : 1.44000E+07 CC
: ABOVE VOLUME IS FOR THE THIRD 6 INCHES OF CONCRETE
: IN THE AXIAL UP DIRECTION.
:
: (INTERVALS 52-54 TOT@UPRS)

NUCLIDE SYM	Z	M	HALF-LIFE (SECONDS)	SHUTDOWN	CONCENTRATION (CURIES/CC) AT TIME 3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
H	1	3	3.87233E+08	5.87293E-09	4.95744E-09	4.42785E-09	3.33834E-09	1.89761E-09	1.07865E-09	1.98111E-10	2.06828E-11
HE	2	6	8.09751E-01	9.72020E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
LI	3	8	8.[illegible]78E-01	1.55245E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	8	3.00064E-16	2.56641E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	10	7.88563E+13	1.18536E-19	1.18536E-19	1.18536E-19	1.18536E-19	1.18535E-19	1.18535E-19	1.18534E-19	1.18533E-19
B	5	12	1.99754E-02	2.14208E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
C	6	14	1.80970E+11	2.87407E-12	2.87303E-12	2.87234E-12	2.87060E-12	2.86713E-12	2.86367E-12	2.85331E-12	2.83954E-12
F	9	20	1.10023E+01	1.07398E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NE	10	23	3.76710E+01	1.49303E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NA	11	24	5.41521E+04	2.93322E-07	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MG	12	27	5.68153E+02	7.61331E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AL	13	28	1.38629E+02	3.24689E-07	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SI	14	31	9.43057E+03	2.96126E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	1.06226E-10	9.12491E-34	3.82731E-49	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
S	16	35	7.60030E+06	3.77973E-10	6.72503E-14	2.12740E-16	1.19742E-22	3.79333E-35	1.20169E-47	0.00000E+00	0.00000E+00
S	16	37	3.04012E+02	6.92078E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CL	17	36	9.77641E+12	2.70807E-13	2.70805E-13	2.70804E-13	2.70801E-13	2.70794E-13	2.70788E-13	2.70770E-13	2.70746E-13
AR	18	37	3.02684E+06	3.03376E-09	1.16532E-18	6.15774E-25	1.24992E-40	5.14940E-72	0.00000E+00	0.00000E+00	0.00000E+00
AR	18	39	8.48405E+09	4.88876E-11	4.85109E-11	4.82614E-11	4.76432E-11	4.64306E-11	4.52488E-11	4.18808E-11	3.77769E-11
AR	18	41	6.60140E+03	3.60512E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
K	19	40	4.10146E+16	3.75650E-16	3.75650E-16	3.75650E-16	3.75650E-16	3.75650E-16	3.75650E-16	3.75650E-16	3.75650E-16
K	19	42	4.47192E+04	1.01170E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CA	20	41	2.52053E+12	8.05394E-11	8.05373E-11	8.05359E-11	8.05324E-11	8.05254E-11	8.05184E-11	8.04975E-11	8.04695E-11
CA	20	45	1.42623E+07	3.11497E-08	3.12768E-10	1.45569E-11	6.80278E-15	1.48564E-21	3.24446E-28	3.37934E-48	7.60678E-75
CA	20	47	3.91608E+05	1.60513E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	46	7.25049E+06	4.10284E-09	4.81290E-13	1.15333E-15	3.242[illegible]9E-22	2.56200E-35	2.02448E-48	0.00000E+00	0.00000E+00
SC	21	47	2.96217E+05	5.86756E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	48	1.58253E+05	1.52760E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	49	3.44849E+03	6.31391E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	50	1.03147E+02	2.65852E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	3.48315E+02	4.54910E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	49	2.85246E+07	4.45827E-16	[illegible].46736E-17	9.63772E-18	2.08345E-19	9.73636E-23	4.55003E-26	4.64361E-36	2.21470E-49
V	23	52	2.02084E+02	1.20398E-06	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	53	1.19922E+02	3.73513E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	54	5.50117E+01	4.74556E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39843E+06	1.78815E-09	2.34381E-21	2.80713E-29	4.40696E-49	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	3.38528E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	3.32533E-19	3.32533E-19	3.32533E-19	3.32532E-19	3.32532E-19	3.32531E-19	3.32529E-19	3.32527E-19
MN	25	54	2.61565E+07	4.22616E-10	3.43855E-11	6.45647E-12	9.86384E-14	2.30223E-17	5.37330E-21	6.83182E-32	2.02736E-46
MN	25	56	9.29152E+03	2.73936E-06	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	6.12976E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	7.97752E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	[illegible].49609E-07	1.57092E-07	9.21584E-08	2.42933E-08	1.68806E-09	1.17298E-10	3.93550E-14	9.17515E-19
FE	26	59	3.89409E+06	4.19483E-09	2.01416E-16	2.66078E-21	1.68778E-33	6.79038E-58	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	60	3.15569E+12	7.78391E-25	7.78375E-25	7.78364E-25	7.78338E-25	7.78284E-25	7.78230E-25	7.78068E-25	7.77852E-25
FE	26	61	3.60001E+02	9.70641E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	57	2.34838E+07	3.07826E-15	1.88247E-16	2.92199E-17	2.77366E-19	2.49920E-23	2.25188E-27	1.64735E-39	1.08585E-55
CO	27	58	6.13405E+06	1.24073E-12	2.80280E-17	2.23976E-20	4.04311E-28	1.31745E-43	4.29290E-59	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	7.92011E-09	5.33373E-09	4.09793E-09	2.12031E-09	5.67630E-10	1.51961E-10	2.91563E-12	1.49761E-14
CO	27	61	5.94007E+03	1.05262E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	62	8.34012E+02	4.78158E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	64	2.99999E-01	2.65589E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	[illegible]
NI	28	59	2.52053E+12	2.15631E-14	2.15625E-14	2.15621E-14	2.15612E-14	2.15593E-14	2.15574E-14	2.15518E-14	2.1[illegible]44E-14
NI	28	63	2.90020E+09	3.12596E-12	3.05602E-12	3.01027E-12	2.89886E-12	2.68826E-12	2.49297E-12	1.98815E-12	1.47037E-12
NI	28	65	9.21738E+03	3.67586E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CU	29	64	4.62098E+04	5.51777E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RB	37	86	1.60972E+06	5.52162E-16	1.09037E-33	1.71625E-45	5.33484E-75	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	87	1.00799E+04	3.13548E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	89	4.50096E+06	1.97011E-16	9.17581E-21	5.51337E-25	1.54295E-35	1.20837E-56	9.46330E-78	0.00000E+00	0.00000E+00
SR	38	90	8.86377E+08	4.72562E-19	4.38840E-19	4.17706E-19	3.69218E-19	2.88475E-19	2.25389E-19	1.07499E-19	4.00594E-20
SR	38	[illegible]	3.48315E+04	4.19058E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	92	9.75604E+03	1.95481E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	93	4.50095E+02	9.95162E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	89	1.56998E+01	3.79822E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	90	2.30281E+05	5.37212E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	91	5.09667E+06	5.03196E-15	1.28819E-20	2.41071E-24	1.15493E-33	2.65069E-52	6.08362E-71	0.00000E+00	0.00000E+00
Y	39	92	1.27440E+04	1.50572E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	94	1.12200E+03	3.20492E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	96	9.80496E+00	2.92952E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	88	7.20602E+06	7.84430E-18	8.70200E-22	2.08907E-24	5.14574E-31	3.37542E-44	2.21416E-57	0.00000E+00	0.00000E+00
ZR	40	89	2.82249E+05	8.35715E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	93	4.74758E+13	1.14029E-16	1.14029E-16	1.14029E-16	1.14029E-16	1.14028E-16	1.14028E-16	1.14026E-16	1.14024E-16
ZR	40	95	5.63534E+06	6.64987E-14	5.82855E-19	2.47770E-22	9.23238E-31	1.28174E-47	1.77946E-64	0.00000E+00	0.00000E+00
ZR	40	97	6.04840E+04	4.14738E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	91	2.20888E+10	2.96364E-19	2.95485E-19	2.94900E-19	2.93443E-19	2.90552E-19	2.87689E-19	2.79268E-19	2.68422E-19
NB	41	92	8.80746E+05	1.23290E-14	5.40433E-47	1.44748E-68	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	94	6.30134E+11	1.47091E-14	1.47076E-14	1.47066E-14	1.47040E-14	1.46989E-14	1.46938E-14	1.46785E-14	1.46582E-14
NB	41	95	3.02684E+06	1.52169E-15	5.84510E-25	3.08863E-31	6.26942E-47	2.58286E-78	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	96	8.78132E+04	2.87283E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	97	4.33217E+03	2.71964E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	98	3.06025E+03	8.01516E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	100	3.09994E+00	5.46312E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	93	2.84077E+11	4.36948E-17	4.36847E-17	4.36780E-17	4.36611E-17	4.36275E-17	4.35940E-17	4.34934E-17	4.33596E-17
MO	42	99	2.41515E+05	1.10994E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	101	8.76292E+02	5.88617E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	104	2.61565E+02	6.28299E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	106	7.84813E+03	3.44668E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PD	46	107	2.05134E+14	1.32431E-23	1.32431E-23	1.32431E-23	1.32430E-23	1.32430E-23	1.32430E-23	1.32430E-23	1.32429E-23
PD	46	109	4.83704E+04	3.49214E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	186	7.34422E+05	1.38603E-16	2.17079E-55	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	108	4.10389E+09	1.56260E-12	1.53781E-12	1.52150E-12	1.48149E-12	1.40459E-12	1.33169E-12	1.13490E-12	9.16990E-13
AG	47	110	2.15826E+07	2.30819E-10	1.10355E-11	1.45370E-12	9.15551E-15	3.63156E-19	1.44046E-23	8.98943E-37	2.22517E-54
CD	48	109	3.99508E+07	2.87577E-17	5.56408E-18	1.86132E-18	1.20472E-19	5.04683E-22	2.11424E-24	1.55435E-31	4.78715E-41
CD	48	111	2.92221E+03	7.03193E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	115	1.92541E+05	2.10932E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	117	1.22399E+04	6.29808E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	119	5.97541E+02	3.53302E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	111	2.42444E+05	9.83838E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	112	1.25400E+03	5.82280E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	114	4.27869E+06	1.00117E-17	2.18644E-24	7.92915E-29	6.27988E-40	3.93890E-62	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	115	1.61497E+04	1.16231E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	116	1.40998E+01	5.05230E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	117	6.95931E+03	7.40653E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	118	2.63955E+02	2.57951E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	119	1.26027E+02	2.73135E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	120	4.40093E+01	5.64339E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	122	1.[illegible]0998E+01	7.71856E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	113	9.94473E+06	6.15825E-14	8.38846E-17	1.03078E-18	1.72536E-23	4.83382E-33	1.35423E-42	2.97818E-71	0.00000E+00
SN	50	121	9.72156E+04	9.05582E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	123	1.07967E+07	1.28201E-12	2.93936E-15	5.11086E-17	2.03754E-21	3.23824E-30	5.14650E-39	2.06599E-65	0.00000E+00
SN	50	125	8.12599E+05	1.64458E-11	1.39386E-46	5.79418E-70	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00

I	53	130	4.44981E+04	2.53351E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
XE	54	133	4.56018E+05	1.24930E-15	3.98590E-76	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	132	5.58990E+05	1.09872E-14	1.14083E-65	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	134	6.47801E+07	6.90803E-10	2.50850E-10	1.27680E-10	2.35988E-11	8.06164E-13	2.75395E-14	1.09790E-18	1.49520E-24
EU	63	152	4.17559E+08	7.16095E-09	6.11953E-09	5.51083E-09	4.24095E-09	2.51163E-09	1.48747E-09	3.08976E-10	3.80096E-11
EU	63	154	2.69812E+08	6.85874E-10	5.37796E-10	4.57298E-10	3.04899E-10	1.35540E-10	6.02529E-11	5.29311E-12	2.06707E-13
LU	71	174	1.22687E+07	6.09560E-21	2.89796E-23	8.19365E-25	1.10139E-28	1.99007E-36	3.59574E-44	2.12106E-67	0.00000E+00
LU	71	177	1.38242E+07	2.36197E-18	2.04986E-20	8.65683E-22	3.17283E-25	4.26200E-32	5.72505E-39	1.38766E-59	0.00000E+00
HF	72	173	8.49653E+04	5.11949E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	175	6.04840E+06	4.20959E-11	8.17259E-16	5.90348E-19	8.27910E-27	1.62822E-42	3.20216E-58	0.00000E+00	0.00000E+00
HF	72	178	9.78261E+08	2.05118E-19	1.91810E-19	1.83421E-19	1.64020E-19	1.31156E-19	1.04876E-19	5.36231E-20	2.19238E-20
HF	72	179	1.89384E+10	9.91867E-21	9.88436E-21	9.86156E-21	9.80477E-21	9.69218E-21	9.58087E-21	9.25458E-21	8.83674E-21
HF	72	180	1.98723E+04	2.87054E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	181	3.66357E+06	2.68475E-10	4.46458E-18	2.90871E-23	3.15144E-36	3.69904E-62	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	182	2.84077E+14	1.00564E-25	1.00564E-25	1.00564E-25	1.00564E-25	1.00564E-25	1.00564E-25	1.00563E-25	1.00563E-25
TA	73	180	2.93458E+04	2.39370E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TA	73	182	9.89362E+06	3.90818E-10	5.14513E-13	6.18630E-15	9.77361E-20	2.44412E-29	6.11208E-39	9.55864E-68	0.00000E+00
W	74	181	1.20968E+07	1.77544E-14	7.82290E-17	2.10253E-18	2.48940E-22	3.49181E-30	4.89686E-38	1.35059E-61	0.00000E+00
W	74	185	6.47801E+06	1.98147E-11	7.89929E-16	9.21840E-19	4.28882E-26	9.28260E-41	2.00913E-55	0.00000E+00	0.00000E+00
W	74	187	8.59984E+04	3.93203E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	203	4.02525E+06	7.00689E-17	5.82609E-24	1.10988E-28	1.75807E-40	4.41085E-64	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	205	3.11947E+02	5.32625E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	204	1.19282E+08	7.31054E-19	4.21721E-19	2.92242E-19	1.16825E-19	1.86690E-20	2.98337E-21	1.21748E-23	7.93972E-27
TL	81	206	2.52054E+02	1.25313E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	207	2.86188E+02	1.03556E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	203	1.86782E+05	2.66438E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	205	4.76390E+14	1.21573E-19	1.21573E-19	1.21573E-19	1.21573E-19	1.21573E-19	1.21573E-19	1.21573E-19	1.21573E-19
PB	82	207	7.95989E-01	2.65801E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TOTAL (CURIES/CC)				3.80622E-06	1.74767E-07	1.0[illegible]39E-07	3.44572E-08	6.93549E-09	3.02842E-09	6.43995E-10	1.82695E-10
TOTAL (CURIES)				5.48095E+01	2.51693E+00	1.53[illegible]+00	4.96184E-01	9.98710E-02	4.36093E-02	9.27353E-03	2.63080E-03

COMPONENT : CONCRETE - AXIAL UP - FOURTH 6 INCHES - RS
VOLUME : 1.44000E+07 CC
: ABOVE VOLUME IS FOR THE FOURTH 6 INCHES OF CONCRETE
: IN THE AXIAL UP DIRECTION.
:
: (INTERVALS 55-57 TOTGUPRS)

NUCLIDE SYM	Z	M	HALF-LIFE (SECONDS)	CONCENTRATION (CURIES/CC) AT TIME SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
H	1	3	3.87233E+08	6.28796E-10	5.30777E-10	4.74075E-10	3.57425E-10	2.03170E-10	1.15488E-10	2.12110E-11	2.21444E-12
HE	2	6	8.09751E-01	2.15368E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
LI	3	8	8.40178E-01	1.66266E-12	0.00000E+00	0.00000E+00	0.00000E+00	6.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	8	3.00064E-16	5.69237E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	10	7.88563E+13	1.96486E-20	1.96486E-20	1.96486E-20	1.96485E-20	1.96485E-20	1.964[illegible]E-20	1.96483E-20	1.96480E-20
B	5	12	1.99754E-02	2.29420E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.000[illegible]E+00	0.00000E+00	0.00000E+00
C	6	14	1.80978E+11	3.08152E-13	3.08040E-13	3.07965E-13	3.07779E-13	3.07408E-13	3.07036E-13	3.05925E-13	3.04450E-13
F	9	20	1.10023E+01	2.62849E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NE	10	23	3.76710E+01	3.52563E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NA	11	24	5.41521E+04	3.14737E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MG	12	27	5.68153E+02	1.77465E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AL	13	28	1.38629E+02	3.58051E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SI	14	31	9.43057E+03	6.64745E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	2.39099E-11	2.05308E-34	8.61467E-50	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
S	16	35	7.60030E+06	4.05726E-11	7.21802E-15	2.28361E-17	1.28535E-23	4.07186E-36	1.28993E-48	0.00000E+00	0.00000E+00
S	16	37	3.04012E+02	1.64167E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CL	17	36	9.77641E+12	2.91892E-14	2.91890E-14	2.91888E-14	2.91885E-14	2.91878E-14	2.91872E-14	2.91852E-14	2.91826E-14
AR	18	37	3.02684E+06	7.01171E-10	2.69333E-19	1.42320E-25	2.88885E-41	1.19014E-72	0.00000E+00	0.00000E+00	6.00000E+00
AR	18	39	8.48405E+09	5.78725E-12	5.74266E-12	5.71313E-12	5.63995E-12	5.49640E-12	5.35650E-12	4.95780E-12	4.47198E-12
AR	18	41	6.60140E+03	8.40024E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
K	19	40	4.10146E+16	4.02412E-17	4.02412E-17	4.02412E-17	4.02412E-17	4.02412E-17	4.02412E-17	4.02412E-17	4.02412E-17
K	19	42	4.47192E+04	1.08601E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CA	20	41	2.52053E+12	8.61794E-12	8.61771E-12	8.61756E-12	8.61719E-12	8.61644E-12	8.61569E-12	8.61345E-12	8.61046E-12
CA	20	45	1.42623E+07	3.34626E-09	3.35991E-11	1.56377E-12	7.30789E-16	1.59595E-22	3.48537E-29	3.63026E-49	8.25752E-76
CA	20	47	3.91608E+05	1.71759E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	6.00000E+00
SC	21	46	7.25049E+06	4.40624E-10	5.16882E-14	1.23862E-16	3.48195E-23	2.75146E-36	2.17419E-49	0.00000E+00	0.00000E+00
SC	21	47	2.96217E+05	1.31870E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	48	1.58253E+05	3.70216E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	49	3.44849E+03	1.45893E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000[illegible]+00	0.00000E+00
SC	21	50	1.03147E+02	6.58659E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.0000[illegible]+00	0.00000E+00
TI	22	51	3.48315E+02	4.87865E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	49	2.85246E+07	1.10519E-16	1.10744E-17	2.38915E-18	5.16480E-20	2.41361E-23	1.12794E-26	1.15113E-36	5.49017E-50
V	23	52	2.02084E+02	1.29044E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	53	1.19922E+02	8.89809E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	54	5.50117E+01	1.17605E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39843E+06	1.94364E-10	2.54761E-22	3.05121E-30	4.79016E-50	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	7.87868E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	8.24335E-20	8.24334E-20	8.24334E-20	8.24333E-20	8.24331E-20	8.24330E-20	8.24325E-20	8.24319E-20
MN	25	54	2.61565E+07	9.56996E-11	7.78645E-12	1.46204E-12	2.23362E-14	5.21331E-18	1.21676E-21	1.54704E-32	4.59086E-47
MN	25	56	9.29152E+03	2.94379E-07	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	1.44488E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	1.97130E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	3.74202E-08	1.68142E-08	9.86411E-09	2.60022E-09	1.80681E-10	1.25549E-11	4.21233E-15	9.82056E-20
FE	26	59	3.89409E+06	4.51137E-10	2.16615E-17	2.86155E-22	1.81513E-34	7.30278E-59	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	60	3.15569E+12	1.92866E-25	1.92862E-25	1.92860E-25	1.92853E-25	1.92840E-25	1.92826E-25	1.92786E-25	1.92733E-25
FE	26	61	3.60001E+02	2.40610E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	57	2.34838E+07	7.62895E-16	4.66540E-17	7.24166E-18	6.87407E-20	6.19385E-24	5.58091E-28	4.08268E-40	2.69111E-56
CO	27	58	6.13405E+06	2.79710E-13	6.31851E-18	5.04921E-21	9.11463E-29	2.97000E-44	9.67774E-60	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	8.53757E-10	5.74956E-10	4.41741E-10	2.28561E-10	6.11883E-11	1.63808E-11	3.14294E-13	1.61437E-15
CO	27	61	5.94007E+03	2.44762E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	62	8.34012E+02	1.16045E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00

CD	27	64	2.99999E-01	6.58356E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NI	28	59	2.52053E+12	2.30964E-15	2.30958E-15	2.30954E-15	2.30944E-15	2.30924E-15	2.30904E-15	2.30843E-15	2.30763E-15
NI	28	63	2.90020E+09	3.41181E-13	3.33548E-13	3.28554E-13	3.16395E-13	2.93409E-13	2.72093E-13	2.16996E-13	1.60483E-13
NI	28	65	9.21738E+03	8.54752E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CU	29	64	4.62098E+04	5.92219E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RB	37	86	1.60972E+06	1.36134E-16	2.68828E-34	4.23137E-46	1.31529E-75	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	87	1.00799E+04	7.67248E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	89	4.50096E+06	4.66452E-15	2.17251E-21	1.30537E-25	3.65316E-36	2.86100E-57	2.24058E-78	0.00000E+00	0.00000E+00
SR	38	90	8.86377E+08	1.14643E-19	1.06462E-19	1.01335E-19	8.95718E-20	6.99835E-20	5.46790E-20	2.60792E-20	9.71836E-21
SR	38	91	3.48315E+04	1.02523E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	92	9.75604E+03	4.83448E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	93	4.50095E+02	2.46476E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	89	1.56998E+01	9.39126E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	90	2.30281E+05	5.75483E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	91	5.09667E+06	1.20411E-15	3.08254E-21	5.76667E-25	2.76366E-34	6.34290E-53	1.45577E-71	0.00000E+00	0.00000E+00
Y	39	92	1.27640E+04	3.66357E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	94	1.12200E+03	7.88736E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	96	9.80406E+00	7.26184E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	88	7.20602E+06	1.85961E-18	2.06295E-22	4.76283E-25	1.21988E-31	8.00196E-45	5.24900E-58	0.00000E+00	0.00000E+00
ZR	40	89	2.82249E+05	2.01798E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	93	4.74758E+13	1.23129E-17	1.23129E-17	1.23129E-17	1.23129E-17	1.23128E-17	1.23128E-17	1.23126E-17	1.23124E-17
ZR	40	95	5.63534E+06	1.64798E-14	1.44444E-19	6.14647E-23	2.28798E-31	3.17643E-48	4.40988E-65	0.00000E+00	0.00000E+00
ZR	40	97	6.04840E+04	5.81484E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	91	2.20888E+10	7.31579E-20	7.29409E-20	7.27966E-20	7.24370E-20	7.17232E-20	7.10165E-20	6.89377E-20	6.62604E-20
NB	41	92	8.80746E+05	3.00218E-15	1.31598E-47	3.52470E-69	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	94	6.30134E+11	1.63325E-15	1.63308E-15	1.63297E-15	1.63268E-15	1.63212E-15	1.63155E-15	1.62985E-15	1.62759E-15
NB	41	95	3.02684E+06	3.62906E-16	1.39399E-25	7.36606E-32	1.49519E-47	6.15985E-79	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	96	8.28132E+04	6.96991E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	97	4.33217E+03	6.53716E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	98	3.06025E+03	1.96958E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	100	3.09994E+00	1.35366E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	93	2.84077E+11	7.57218E-18	7.57043E-18	7.56926E-18	7.56635E-18	7.56052E-18	7.55470E-18	7.53727E-18	7.51409E-18
MO	42	99	2.41515E+05	1.36972E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	101	8.76292E+02	7.04139E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	104	2.61565E+02	1.53844E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	106	7.84813E+03	8.27235E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PD	46	107	2.05134E+14	3.17925E-24	3.17925E-24	3.17924E-24	3.17924E-24	3.17924E-24	3.17924E-24	3.17923E-24	3.17921E-24
PD	46	109	4.83704E+04	8.36771E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	106	7.3[illegible]422E+05	3.43592E-17	5.38131E-56	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	108	4.10389E+09	1.69330E-13	1.66644E-13	1.64877E-13	1.60541E-13	1.52208E-13	1.44307E-13	1.22983E-13	9.93691E-14
AG	47	110	2.15826E+07	2.56952E-11	1.22850E-12	1.61829E-13	1.01921E-15	4.04272E-20	1.60355E-24	1.00072E-37	2.47710E-55
CD	48	109	3.99508E+07	6.88721E-18	1.33255E-18	4.45769E-19	2.88521E-20	1.20867E-22	5.06342E-25	3.72252E-32	1.14648E-41
CD	48	111	2.92221E+03	1.70318E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	115	1.92541E+05	5.19852E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	117	1.22399E+04	1.56124E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	119	5.97541E+02	8.75822E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	111	2.42444E+05	2.42592E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	112	1.25400E+03	1.39431E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	114	4.27869E+06	2.41751E-18	5.27956E-25	1.91464E-29	1.51639E-40	9.51121E-63	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	115	1.61497E+04	2.78414E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	116	1.40998E+01	1.23480E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	217	6.95931E+03	1.78155E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	118	2.63955E+02	6.34857E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	119	1.26027E+02	6.61533E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	120	4.40093E+01	1.39837E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	122	1.00998E+01	1.91340E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	113	9.94473E+06	1.05211E-14	1.43312E-17	1.76103E-19	2.94770E-24	8.25834E-34	2.31371E-43	5.[illegible]07E-72	0.00000E+00
SN	50	121	9.72156E+04	1.00538E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	123	1.07967E+07	1.42513E-13	3.26751E-16	5.68144E-18	2.26502E-22	3.59977E-31	5.72107E-40	2.29664E-66	0.00000E+00
SN	50	125	8.12599E+05	1.81521E-12	1.53847E-47	6.39531E-71	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
I	53	130	4.44981E+04	6.11176E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
XE	54	133	4.56018E+05	2.95168E-16	9.41738E-79	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	132	5.58990E+05	2.72368E-15	2.82808E-66	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	134	6.47801E+07	7.65877E-11	2.78112E-11	1.41555E-11	2.61634E-12	8.93775E-14	3.05324E-15	1.21722E-19	1.65769E-25
EU	63	152	4.17559E+08	7.66223E-10	6.54791E-10	5.89659E-10	4.53782E-10	2.68745E-10	1.59159E-10	3.30604E-11	4.06703E-12
EU	63	154	2.69812E+08	7.39914E-11	5.80169E-11	4.93329E-11	3.28922E-11	1.46219E-11	6.50003E-12	5.71016E-13	2.22994E-14
LU	71	174	1.22687E+07	1.39526E-21	6.63331E-24	1.87549E-25	2.52104E-29	4.55519E-37	8.23050E-45	4.85502E-68	0.00000E+00
LU	71	177	1.38242E+07	5.64942E-19	4.98291E-21	2.87056E-22	7.50804E-26	1.01939E-32	1.36933E-39	3.31904E-60	0.00000E+00
HF	72	173	8.49653E+04	1.26910E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	175	6.04848E+06	4.53808E-12	8.81031E-17	6.36414E-20	8.92513E-28	1.75527E-43	3.45203E-59	0.00000E+00	0.00000E+00
HF	72	178	9.78261E+08	4.96006E-20	4.63825E-20	4.43540E-20	3.96623E-20	3.17153E-20	2.53607E-20	1.29668E-20	5.30150E-21
HF	72	179	1.89384E+10	2.38415E-21	2.37591E-21	2.37042E-21	2.35677E-21	2.32971E-21	2.30296E-21	2.22453E-21	2.12409E-21
HF	72	180	1.98723E+04	5.02276E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	181	3.66357E+06	2.95144E-11	4.90806E-19	3.19764E-24	3.46449E-37	4.06648E-63	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	182	2.84077E+14	2.45160E-26	2.45160E-26	2.45160E-26	2.45160E-26	2.45160E-26	2.45160E-26	2.45159E-26	2.45158E-26
TA	73	180	2.93458E+04	5.92763E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TA	73	182	9.89362E+06	4.44398E-11	5.85050E-14	7.82759E-16	1.11135E-20	2.77919E-30	6.95001E-40	1.08691E-68	0.00000E+00
W	74	181	1.20968E+07	4.40112E-15	1.93921E-17	5.21192E-19	6.17217E-23	8.65570E-31	1.21388E-38	3.34795E-62	0.00000E+00
W	74	185	6.47801E+06	2.21533E-12	8.83160E-17	1.03064E-19	4.79500E-27	1.03782E-41	2.24625E-56	0.00000E+00	0.00000E+00
W	74	187	8.59984E+04	4.36276E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	203	4.02525E+06	1.71355E-17	1.42478E-24	2.71422E-29	4.29939E-41	1.07868E-64	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	205	3.11947E+02	1.31380E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	204	1.19282E+08	1.77132E-19	1.02181E-19	7.08091E-20	2.83062E-20	4.52343E-21	7.22858E-22	2.94992E-24	1.92377E-27
TL	81	206	2.52054E+02	3.07094E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	207	2.86188E+02	2.52403E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	203	1.86782E+05	6.60476E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	205	4.76390E+14	3.01257E-20	3.01257E-20	3.01257E-20	3.01257E-20	3.01257E-20	3.01257E-20	3.01256E-20	3.01256E-20
PB	82	207	7.95989E-01	6.57744E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TOTAL (CURIES/CC)				4.10353E-07	1.87185E-08	1.14514E-08	3.69059E-09	7.43394E-10	3.24814E-10	6.94112E-11	1.99852E-11
TOTAL (CURIES)				5.90908E+00	2.69546E-01	1.64900E-01	5.31445E-02	1.07049E-02	4.67733E-03	9.99522E-04	2.87787E-04

COMPONENT : CONCRETE - AXIAL UP - FIFTH 6 INCHES - R5
VOLUME : 1.44000E+07 CC
: ABOVE VOLUME IS FOR THE FIFTH 6 INCHES OF CONCRETE
: IN THE AXIAL UP DIRECTION.
:
: (INTERVALS 50-60 TOTGUPR5)

CONCENTRATION (CURIES/CC) AT TIME

NUCLIDE SYM	Z	N	HALF-LIFE (SECONDS)	SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
H	1	3	3.87233E+08	8.58670E-11	7.24824E-11	6.47393E-11	4.88096E-11	2.77448E-11	1.57709E-11	2.09656E-12	3.22401E-13
HE	2	6	8.09751E-01	4.86311E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
LI	3	8	8.40170E-01	2.27152E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	8	3.00064E-16	1.20549E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	10	7.88563E+13	3.90822E-21	3.90821E-21	3.90821E-21	3.90821E-21	3.90820E-21	3.90818E-21	3.90815E-21	3.90811E-21
B	5	12	1.99784E-02	3.13443E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
C	6	14	1.80970E+11	4.21570E-14	4.21426E-14	4.21324E-14	4.21069E-14	4.20561E-14	4.20053E-14	4.18532E-14	4.16514E-14
F	9	20	1.10023E+01	6.45096E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NE	10	23	3.76710E+01	8.41147E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NA	11	24	5.41521E+04	4.31130E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MG	12	27	5.68153E+02	4.18775E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AL	13	28	1.38629E+02	5.08517E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SI	14	31	9.43057E+03	1.51148E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	5.45606E-12	4.68680E-35	1.96581E-50	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
S	16	35	7.60030E+06	5.55483E-12	9.88335E-16	3.12651E-18	1.75978E-26	5.57482E-37	1.76606E-49	0.00000E+00	0.00000E+00
S	16	37	3.04012E+02	3.93117E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CL	17	36	9.77641E+12	4.02897E-15	4.02894E-15	4.02893E-15	4.02888E-15	4.02879E-15	4.02870E-15	4.02843E-15	4.02807E-15
AR	18	37	3.02604E+06	1.64120E-10	6.30416E-20	3.33120E-26	6.76178E-42	2.78571E-73	0.00000E+00	0.00000E+00	0.00000E+00
AR	18	39	8.48405E+09	8.86735E-13	8.79902E-13	8.75377E-13	8.64164E-13	8.42169E-13	8.20733E-13	7.59644E-13	6.85206E-13
AR	18	41	6.60160E+03	1.98251E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
K	19	40	4.10146E+16	5.49952E-18	5.49952E-18	5.49952E-18	5.49952E-18	5.49952E-18	5.49952E-18	5.49952E-18	5.49952E-18
K	19	42	4.47192E+04	1.48870E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CA	20	41	2.52053E+12	1.17444E-12	1.17441E-12	1.17439E-12	1.17434E-12	1.17424E-12	1.17414E-12	1.17383E-12	1.17342E-12
CA	20	45	1.42623E+07	6.59014E-10	6.60887E-12	2.14507E-13	1.00244E-16	2.18920E-23	4.78096E-30	4.97771E-50	1.13270E-76
CA	20	47	3.91608E+05	2.34081E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	46	7.25049E+06	6.05461E-11	7.10246E-15	1.70199E-17	4.70454E-26	3.78077E-37	2.98756E-50	0.00000E+00	0.00000E+00
SC	21	47	2.96217E+05	3.01342E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	48	1.58253E+05	9.02549E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	49	3.44849E+03	3.41877E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	50	1.03147E+02	1.63538E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	3.48315E+02	6.67907E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	49	2.85246E+07	2.74543E-17	2.75102E-18	5.93496E-19	1.28300E-20	5.99570E-24	2.80193E-27	2.85956E-37	1.36383E-50
V	23	52	2.02084E+02	1.76489E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	53	1.19922E+02	2.13863E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	54	5.50117E+01	2.92868E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39843E+06	2.71958E-11	3.56467E-23	4.26933E-31	6.79250E-51	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	1.85719E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	2.04775E-20	2.04775E-20	2.04774E-20	2.04774E-20	2.04774E-20	2.04773E-20	2.04772E-20	2.04771E-20
MN	25	54	2.61565E+07	2.19782E-11	1.78822E-12	3.35769E-13	5.12970E-15	1.19728E-18	2.79439E-22	3.55289E-33	1.05433E-47
MN	25	56	9.29152E+03	4.04312E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	3.44326E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	4.08343E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	5.10181E-09	2.29242E-09	1.34486E-09	3.54509E-10	2.46337E-11	1.71172E-12	5.74303E-16	1.33892E-20
FE	26	59	3.89409E+06	6.20203E-11	2.97793E-18	3.93394E-23	2.49536E-35	1.00395E-59	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	60	3.15569E+12	4.78906E-26	4.78896E-26	4.78888E-26	4.78871E-26	4.78838E-26	4.78805E-26	4.78705E-26	4.78572E-26
FE	26	61	3.60001E+02	5.97688E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	57	2.34838E+07	1.89471E-16	1.15869E-17	1.79852E-18	1.70723E-20	1.53829E-24	1.38606E-28	1.01397E-40	6.08358E-57
CO	27	58	6.13405E+06	6.60281E-14	1.44636E-18	1.15581E-21	2.08642E-29	6.79859E-45	2.21532E-60	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	1.17041E-10	7.93592E-11	6.09720E-11	3.15475E-11	8.44562E-12	2.26099E-12	4.33809E-14	2.22826E-16
CO	27	61	5.94007E+03	5.76529E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	62	8.34012E+02	2.83153E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	64	2.99999E-01	1.63538E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NI	28	59	2.52053E+12	3.15664E-16	3.15656E-16	3.15651E-16	3.15637E-16	3.15610E-16	3.15582E-16	3.15500E-16	3.15391E-16
NI	28	63	2.90020E+09	4.76926E-14	4.66256E-14	4.59276E-14	4.42276E-14	4.10146E-14	3.80349E-14	3.03330E-14	2.26333E-14
NI	28	65	9.21738E+03	2.01468E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CU	29	64	4.62096E+04	8.11471E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RB	37	86	1.60972E+06	3.36574E-17	6.64644E-35	1.84615E-46	3.25189E-76	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	87	1.00799E+04	1.88468E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	89	4.50096E+06	1.11596E-15	5.19762E-22	3.12306E-26	8.74001E-37	6.04600E-58	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	90	8.86377E+08	2.79691E-20	2.59732E-20	2.47226E-20	[illegible]	1.70737E-20	1.33399E-20	6.36247E-21	2.57096E-21
SR	38	91	3.48315E+04	2.51794E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	92	9.75604E+03	1.19049E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	93	4.50095E+02	6.11800E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	89	1.56990E+01	2.32799E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	90	2.30281E+05	7.86467E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	91	5.09667E+06	2.90590E-16	7.43935E-22	1.39229E-25	6.66976E-35	1.53078E-53	3.51332E-72	0.00000E+00	0.00000E+00
Y	39	92	1.27440E+04	8.95805E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	94	1.12200E+03	1.94701E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	96	9.80406E+00	1.80387E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	88	7.20602E+06	4.65075E-19	4.93760E-23	1.13992E-25	2.91962E-32	1.91517E-45	1.25620E-58	0.00000E+00	0.00000E+00
ZR	40	89	2.82249E+05	6.90557E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	93	4.74758E+13	1.70166E-18	1.70166E-18	1.70165E-18	1.70165E-18	1.70164E-18	1.70163E-18	1.70161E-18	1.70158E-18
ZR	40	95	5.53534E+06	4.09271E-15	3.58723E-20	1.52497E-23	5.68216E-32	7.88859E-49	1.09518E-65	0.00000E+00	0.00000E+00
ZR	40	97	6.04840E+04	1.09494E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	91	2.20884E+10	1.81069E-20	1.80532E-20	1.80175E-20	1.79285E-20	1.77519E-20	1.75769E-20	1.70624E-20	1.63998E-20
NB	41	92	8.00766E+05	7.35089E-16	3.22221E-48	8.63029E-70	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	94	6.30134E+11	2.34893E-16	2.34869E-16	2.34853E-16	2.34812E-16	2.34730E-16	2.34649E-16	2.34405E-16	2.34079E-16
NB	41	95	3.02644E+06	8.73381E-17	3.35482E-26	1.77274E-32	3.59836E-48	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	96	8.28132E+04	1.78188E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	97	4.33217E+03	1.58337E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	98	3.06025E+03	4.05563E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	100	3.09996E+00	3.56131E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	93	2.84077E+11	1.58648E-18	1.58603E-18	1.58570E-18	1.58517E-18	1.58395E-18	1.58273E-18	1.57908E-18	1.57423E-18
MO	42	99	2.41515E+05	2.21955E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	101	8.76292E+02	1.10541E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	104	2.61565E+02	3.78178E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	106	7.00813E+03	1.99954E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PD	46	107	2.05134E+14	7.69408E-25	7.69408E-25	7.69407E-25	7.69407E-25	7.69406E-25	7.69405E-25	7.69403E-25	7.69400E-25
PD	46	109	4.83704E+04	2.02205E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	106	7.34622E+05	8.53527E-18	1.33679E-56	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	108	4.10389E+09	2.35892E-14	2.32150E-14	2.29688E-14	2.23640E-14	2.12039E-14	2.01033E-14	1.71326E-14	1.38430E-14
AG	47	110	2.15826E+07	3.76816E-12	1.80157E-13	2.37319E-14	1.49465E-16	5.92859E-21	2.35158E-25	1.46754E-38	3.63263E-56
CD	48	109	3.99500E+07	1.66335E-18	3.21827E-19	1.07659E-19	6.96812E-21	2.91909E-23	1.22288E-25	8.99035E-33	2.76809E-42
CD	48	111	2.92221E+03	4.15029E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	115	1.92541E+05	1.28492E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	117	1.22399E+04	3.87825E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	119	5.97541E+02	2.17565E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	111	2.42444E+05	5.99843E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	112	1.25400E+03	3.36703E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	114	4.27069E+06	5.87717E-19	1.28350E-25	4.65464E-30	3.68648E-41	2.31225E-63	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	115	1.61497E+04	6.72531E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	116	1.40998E+01	3.82686E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	117	6.95931E+03	4.31782E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	118	2.63955E+02	1.56725E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	119	1.26027E+02	1.61198E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	120	4.40093E+01	3.47243E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	122	1.00998E+01	4.75312E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	113	9.94473E+06	2.19079E-15	2.90418E-18	3.66697E-20	6.13795E-25	1.71962E-34	4.81781E-44	1.05948E-72	0.00000E+00
SN	50	121	9.72156E+04	1.44172E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	123	1.07967E+07	2.05253E-14	4.70600E-17	8.18264E-19	3.26217E-23	5.18452E-32	8.23971E-41	3.50771E-67	0.00000E+00
SN	50	125	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

I	53	130	4.44981E+04	1.48245E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
XE	54	133	4.56018E+05	7.05235E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	132	5.5899[illegible]E+05	6.76597E-16	7.02531E-67	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	134	6.47[illegible]E+07	1.11270E-11	4.04052E-12	2.05657E-12	3.80113E-13	1.29851E-14	4.43588E-16	1.76843E-20	2.40836E-26
EU	63	152	4.17[illegible]E+08	1.04483E-10	8.92879E-11	8.04065E-11	6.18781E-11	3.66462E-11	2.17031E-11	4.50815E-12	5.54583E-13
EU	63	154	2.69812E+08	1.02521E-11	8.03867E-12	6.83544E-12	4.55745E-12	2.02597E-12	9.00626E-13	7.91184E-14	3.08974E-15
LU	71	174	1.22687E+07	3.24684E-22	1.54361E-24	4.36437E-26	5.66660E-30	1.06002E-37	1.91528E-45	1.12979E-68	0.00000E+00
LU	71	177	1.38242E+07	1.36331E-19	1.18317E-21	4.99665E-23	1.83133E-26	2.45999E-33	3.30445E-40	8.00947E-61	0.00000E+00
HF	72	173	8.49653E+04	3.15261E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	175	6.04840E+06	6.29910E-13	1.22292E-17	8.85378E-21	1.23886E-28	2.43641E-44	4.79160E-60	0.00000E+00	0.00000E+00
HF	72	178	9.78261E+08	1.20733E-20	1.12900E-20	1.07962E-20	9.65423E-21	7.71985E-21	6.17305E-21	3.15627E-21	1.29044E-21
HF	72	179	1.89384E+10	5.77576E-22	5.75578E-22	5.74258E-22	5.70943E-22	5.64387E-22	5.57906E-22	5.38905E-22	5.14574E-22
HF	72	180	1.98723E+04	1.22551E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	181	3.66357E+06	4.28479E-12	7.12535E-20	4.64222E-25	5.02962E-38	5.99357E-64	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	182	2.84077E+14	6.00510E-27	6.00510E-27	6.00510E-27	6.00509E-27	6.00509E-27	6.00508E-27	6.00507E-27	6.00505E-27
TA	73	180	2.93458E+04	1.67115E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TA	73	182	9.89362E+06	6.72506E-12	8.85354E-15	1.06348E-16	1.68181E-21	4.20574E-31	1.05174E-40	1.64481E-69	0.00000E+00
W	74	181	1.20968E+07	1.89326E-15	4.81709E-18	1.29467E-19	1.53320E-23	2.15014E-31	3.01533E-39	8.31649E-63	0.00000E+00
W	74	185	6.47801E+06	3.22055E-13	1.28390E-17	1.49830E-20	6.[illegible]078E-28	1.50874E-42	3.26551E-57	0.00000E+00	0.00000E+00
W	74	187	8.59984E+04	6.35852E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	203	4.02525E+06	4.20723E-16	3.49823E-25	6.66417E-30	1.05562E-41	2.64846E-65	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	205	3.11947E+02	3.24955E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	204	1.19282E+08	4.31863E-20	2.49128E-20	1.72639E-20	6.90132E-21	1.10285E-21	1.76239E-22	7.19217E-25	4.69031E-28
TL	81	206	2.52054E+02	7.55369E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	207	2.86188E+02	4.18051E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	203	1.86782E+05	1.64068E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	205	4.76390E+14	7.48106E-21	7.48105E-21	7.48105E-21	7.48105E-21	7.48105E-21	7.48104E-21	7.48103E-21	7.48102E-21
PB	82	207	7.95989E-01	1.63142E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TOTAL (CURIES/CC)				5.65886E-08	2.55440E-09	1.56260E-09	5.03838E-10	1.01634E-10	4.44473E-11	9.55516E-12	2.00143E-12
TOTAL (CURIES)				8.14875E-01	3.67833E-02	2.25015E-02	7.25527E-03	1.46354E-03	6.40040E-04	1.37[illegible]E-04	4.03406E-05

COMPONENT : CONCRETE - AXIAL UP - SIXTH 6 INCHES - R5
VOLUME : 1.44000E+07 CC
: ABOVE VOLUME IS FOR THE SIXTH 6 INCHES OF CONCRETE
: IN THE AXIAL UP DIRECTION.
:
: (INTERVALS 61-63 TOTGUPR5)

NUCLIDE			HALF-LIFE			CONCENTRATION (CURIES/CC) AT TIME					
SYN	Z	M	(SECONDS)	SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
H	1	3	3.87233E+08	1.40414E-11	1.25279E-11	1.11095E-11	8.43626E-12	4.79540E-12	2.72504E-12	5.00641E-13	5.22670E-14
HE	2	6	8.09751E-01	1.11622E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
LI	3	8	8.40178E-01	3.92778E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	8	3.00064E-16	2.94394E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	10	7.88563E+13	8.52908E-22	8.52907E-22	8.52907E-22	8.52905E-22	8.52903E-22	8.52901E-22	8.52893E-22	8.52884E-22
B	5	12	1.99754E-02	5.41938E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
C	6	14	1.80978E+11	7.29706E-15	7.29442E-15	7.29266E-15	7.28825E-15	7.27945E-15	7.27065E-15	7.24434E-15	7.20940E-15
F	9	20	1.10023E+01	1.59196E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NE	10	23	3.76718E+01	2.02279E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NA	11	24	5.41521E+04	7.47215E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MG	12	27	5.68153E+02	9.97949E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AL	13	28	1.38629E+02	9.09907E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SI	14	31	9.43057E+03	3.47800E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	1.26047E-12	1.08276E-38	4.54146E-51	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
S	16	35	7.60030E+06	9.62106E-13	1.71181E-16	5.41517E-19	3.04796E-25	9.65569E-38	3.05804E-50	0.00000E+00	0.00000E+00
S	16	37	3.04012E+02	9.48221E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CL	17	36	9.77641E+12	7.02882E-16	7.02877E-16	7.02874E-16	7.02866E-16	7.02851E-16	7.02835E-16	7.02788E-16	7.02725E-16
AR	18	37	3.02604E+06	3.80181E-11	1.49108E-20	7.87907E-27	1.59932E-42	6.58806E-74	0.00000E+00	0.00000E+00	0.00000E+00
AR	18	39	8.48405E+09	1.67144E-13	1.65856E-13	1.65003E-13	1.62890E-13	1.58744E-13	1.54703E-13	1.43188E-13	1.29157E-13
AR	18	41	6.60140E+03	4.72598E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
K	19	40	4.10146E+16	9.51059E-19	9.51059E-19	9.51059E-19	9.51059E-19	9.51059E-19	9.51059E-19	9.51059E-19	9.51059E-19
K	19	42	4.47192E+04	2.58861E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CA	20	41	2.52053E+12	2.02607E-13	2.02601E-13	2.02598E-13	2.02589E-13	2.02571E-13	2.02554E-13	2.02501E-13	2.02431E-13
CA	20	45	1.42623E+07	7.96009E-11	7.99267E-13	3.71991E-14	1.73848E-17	3.79645E-24	8.29108E-31	8.63567E-51	1.96430E-77
CA	20	47	3.91608E+05	4.03836E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	46	7.25049E+06	1.05234E-11	1.23446E-15	2.95819E-18	8.3[illegible]590E-25	6.57127E-38	5.19258E-51	0.00000E+00	0.00000E+00
SC	21	47	2.96217E+05	6.97226E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	48	1.58253E+05	2.21018E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	49	3.44849E+03	8.10181E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	50	1.03147E+02	4.06706E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	3.48315E+02	1.15691E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	49	2.85246E+07	6.83066E-18	6.04458E-19	1.47662E-19	3.19212E-21	1.49174E-24	6.97125E-28	7.11462E-38	3.39321E-51
V	23	52	2.02084E+02	3.05460E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	53	1.19922E+02	5.17504E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	54	5.50117E+01	7.26498E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39043E+06	4.80117E-12	6.29309E-24	7.53710E-32	1.18326E-51	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	4.42195E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	5.09481E-21	5.09480E-21	5.09480E-21	5.09480E-21	5.09479E-21	5.09478E-21	5.99475E-21	5.09471E-21
MN	25	54	2.61565E+07	5.10995E-12	4.15763E-13	7.80667E-14	1.19266E-15	2.78369E-19	6.49699E-23	8.26051E-34	2.45132E-48
MN	25	56	9.29152E+03	7.02057E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	8.27518E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	1.21204E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	8.80424E-10	3.95606E-10	2.32983E-10	6.11780E-11	4.25107E-12	2.95393E-13	9.91080E-17	2.31059E-21
FE	26	59	3.89409E+06	1.07774E-11	5.17478E-19	6.83605E-24	4.33623E-36	1.74458E-60	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	60	3.15569E+12	1.19107E-26	1.19105E-26	1.19103E-26	1.19099E-26	1.19091E-26	1.19083E-26	1.19058E-26	1.19025E-26
FE	26	61	3.60001E+02	1.48702E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	57	2.34838E+07	4.71316E-17	2.88228E-18	4.47390E-19	4.24679E-21	3.82656E-25	3.44789E-29	2.52228E-41	1.66256E-57
CO	27	58	6.13405E+06	1.48406E-14	3.35242E-19	2.67897E-22	4.83597E-30	1.57580E-45	5.13474E-61	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	2.05417E-11	1.38337E-11	1.06285E-11	5.49927E-12	1.47222E-12	3.94129E-13	7.56203E-15	3.88424E-17
CO	27	61	5.94007E+03	1.37208E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	62	8.34012E+02	6.93717E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00

CO	27	64	2.99999E-01	4.36871E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NI	28	59	2.52053E+12	5.45980E-17	5.45966E-17	5.45956E-17	5.45933E-17	5.45885E-17	5.45838E-17	5.45696E-17	5.45506E-17
NI	28	63	2.90020E+09	8.40154E-15	[illegible]21358E-15	8.09061E-15	7.79119E-15	7.22517E-15	6.70027E-15	5.34349E-15	3.95187E-15
NI	28	65	9.71738E+03	4.79828E-16	[illegible]00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CU	29	64	4.62098E+04	1.40632E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RB	37	86	1.60972E+06	8.33890E-1[illegible]	1.64671E-35	2.59193E-47	8.05682E-77	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	87	1.00799E+04	4.64301E-1[illegible]	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	89	4.50096E+06	7.69144E-[illegible]6	1.25354E-22	7.53204E-27	2.10787E-37	1.65081E-58	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	90	8.86377E+08	6.85253E-21	6.36353E-21	6.05708E-21	5.35397E-21	4.18312E-21	3.26832E-21	1.55883E-21	5.80895E-22
SR	38	91	3.48315E+04	6.20211E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	92	9.75604E+03	2.97647E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	93	4.50095E+02	1.52117E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	89	1.56998E+01	5.7820[illegible]E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	90	2.30281E+05	1.360[illegible]0E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	91	5.09667E+06	7.058[illegible]9E-17	1.80709E-22	3.58178E-26	1.62014E-35	3.71842E-54	8.53418E-73	0.00000E+00	0.00000E+00
Y	39	92	1.27440E+04	2.19[illegible]58E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	94	1.12200E+03	4.81[illegible]31E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	9[illegible]	9.80496E+00	4.48788E-20	0.000[illegible]0E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	88	7.206[illegible]2E+06	1.07306E-19	1.19[illegible]E-23	2.74831E-26	7.03912E-33	4.61741E-46	3.02886E-59	0.00000E+00	0.00000E+00
ZR	40	89	2.82249E+03	1.19857E-17	0.0[illegible]000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	93	4.74758E+13	2.97138E-19	2.[illegible]137E-19	2.97137E-19	2.97136E-19	2.97135E-19	2.[illegible]133E-19	2.97129E-19	2.97124E-19
ZR	40	95	5.63534E+06	1.01804E-15	8.92305E-21	3.79329E-24	1.41341E-32	1.96225E-49	2.72[illegible]22E-66	0.00000E+00	0.00000E+00
ZR	40	97	6.04840E+04	2.30942E-14	0.0[illegible]E+[illegible]	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	91	2.20888E+10	4.49045E-21	4.47713E-21	4.46827E-21	4.44620E-21	4.40239E-21	4.35901E-21	4.23142E-21	4.06708E-21
NB	41	92	8.80746E+05	1.80745E-16	7.92282E-49	2.12203E-70	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	94	6.30134E+11	4.22230E-17	4.22186E-17	4.22157E-17	4.22083E-17	4.21937E-17	4.21790E-17	4.21351E-17	4.20767E-17
NB	41	95	3.02684E+06	2.11662E-17	8.13035E-27	4.29620E-33	8.72057E-49	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	96	8.28132E+04	4.16891E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	97	4.33217E+03	3.85733E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	98	3.06025E+03	1.20000E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	100	3.09994E+00	8.36000E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	93	2.84077E+11	3.45978E-19	3.45898E-19	3.45845E-19	3.45711E-19	3.45445E-19	3.45179E-19	3.44383E-19	3.43324E-19
MO	42	99	2.41515E+05	4.31640E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	101	8.76292E+02	[illegible].10983E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	104	2.61565E+02	9.32368E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	106	7.84813E+03	4.85930E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PD	46	107	2.05134E+14	1.87345E-25	1.87345E-25	1.87345E-25	1.87345E-25	1.87345E-25	1.87344E-25	1.87344E-25	1.87343E-25
PD	46	109	4.83704E+04	4.91778E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	106	7.34422E+05	2.12358E-18	3.32593E-57	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	108	4.10389E+09	4.14051E-15	4.07483E-15	4.03162E-15	3.92560E-15	3.72184E-15	3.52866E-15	3.00722E-15	2.42981E-15
AG	47	110	2.15826E+07	6.85700E-13	3.27836E-14	4.31855E-15	2.71985E-17	1.07884E-21	4.27922E-26	2.67051E-39	6.61038E-57
CD	48	109	3.99508E+07	4.04295E-19	[illegible].82237E-20	2.61677E-20	1.69368E-21	7.09518E-24	2.97234E-26	2.18521E-33	6.73011E-43
CD	48	111	2.92221E+03	1.01598E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	115	1.92541E+05	3.18267E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	117	1.22399E+04	9.64899E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	119	5.97541E+02	5.41305E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	111	2.42444E+05	1.40631E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	112	1.25400E+03	8.18340E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	114	4.27869E+06	1.43611E-19	3.13628E-26	1.13738E-30	9.00803E-42	5.65006E-64	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	115	1.61497E+04	1.63503E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	116	1.40998E+01	7.44842E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	117	6.95931E+03	1.05248E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	118	2.63955E+02	3.87793E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	119	1.26027E+02	3.94599E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	120	4.40093E+01	8.63658E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	122	1.00998E+01	1.18258E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	113	9.94473E+06	4.77341E-16	6.50209E-19	7.98980E-21	1.33737E-25	3.74681E-35	1.04973E-44	2.30846E-73	0.00000E+00
SN	50	121	9.72156E+04	2.58441E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	123	1.07967E+07	3.69964E-15	8.48245E-18	1.47490E-19	5.87998E-24	9.34498E-33	1.48519E-41	5.96206E-68	0.00000E+00
SN	50	125	8.12599E+05	4.64653E-14	3.93015E-49	1.63706E-72	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
I	53	130	4.44981E+04	3.61078E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
XE	54	133	4.56018E+05	1.69966E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	132	5.58990E+05	1.68338E-16	1.74791E-67	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	134	6.47801E+07	2.01209E-12	7.30647E-13	3.71890E-13	6.87357E-14	2.34810E-15	8.02139E-17	3.19784E-21	4.35504E-27
EU	63	152	4.17559E+08	1.80361E-11	1.54131E-11	1.38800E-11	1.06816E-11	6.32599E-12	3.74645E-12	7.78210E-13	9.57339E-14
EU	63	154	2.69812E+08	1.79319E-12	1.40604E-12	1.19559E-12	7.97144E-13	3.54363E-13	1.57529E-13	1.38366E-14	5.40427E-16
LU	71	174	1.22687E+07	7.65645E-23	3.64002E-25	1.02917E-26	1.38342E-30	2.49965E-38	4.51647E-46	2.66418E-69	0.00000E+00
LU	71	177	1.38242E+07	3.31228E-20	2.87460E-22	1.21398E-23	4.44936E-27	5.97675E-34	8.02844E-41	1.94597E-61	0.00000E+00
HF	72	173	8.49653E+04	7.84371E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	175	6.04840E+06	1.10425E-13	2.14381E-18	1.54859E-21	2.17175E-29	4.27110E-45	8.39982E-61	0.00000E+00	0.00000E+00
HF	72	178	9.78261E+08	2.95340E-21	2.76178E-21	2.64099E-21	2.36163E-21	1.88844E-21	1.51006E-21	7.72091E-22	3.15679E-22
HF	72	179	1.89384E+10	1.40753E-22	1.40266E-22	1.39943E-22	1.39137E-22	1.37539E-22	1.35960E-22	1.31329E-22	1.25490E-22
HF	72	180	1.98723E+04	3.00323E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	181	3.66357E+06	7.79100E-13	1.29560E-20	8.44092E-26	9.14532E-39	1.07344E-64	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	182	2.84077E+14	1.47619E-27	1.47619E-27	1.47619E-27	1.47619E-27	1.47618E-27	1.47618E-27	1.47618E-27	1.47618E-27
TA	73	180	2.93458E+04	3.65729E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TA	73	182	9.89362E+06	1.25005E-12	1.64569E-15	1.97680E-17	3.12613E-22	7.81762E-32	1.95497E-41	3.05737E-70	0.00000E+00
W	74	181	1.20968E+07	2.71998E-16	1.19847E-18	3.22107E-20	3.81453E-24	5.34944E-32	7.50200E-40	2.06910E-63	0.00000E+00
W	74	185	6.47801E+06	5.83961E-14	2.32801E-18	2.71677E-21	1.26397E-28	2.73569E-43	5.92113E-58	0.00000E+00	0.00000E+00
W	74	187	8.59984E+04	1.15178E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	203	4.82525E+06	1.03611E-18	8.61502E-26	1.64117E-30	2.59966E-42	6.52231E-66	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	205	3.11947E+02	8.05402E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	204	1.19282E+08	1.05787E-20	6.10248E-21	4.22886E-21	1.69051E-21	2.70148E-22	4.31705E-23	1.76175E-25	1.14891E-28
TL	81	206	2.52054E+02	1.86321E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	207	2.86188E+02	1.51869E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	203	1.86782E+05	4.08190E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	205	4.76390E+14	1.86074E-21	1.86074E-21	1.86074E-21	1.86074E-21	1.86073E-21	1.86073E-21	1.86073E-21	1.86073E-21
PB	82	207	7.95989E-01	4.05349E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TOTAL (CURIES/CC)				9.86293E-09	4.41156E-10	2.69855E-10	8.70475E-11	1.75817E-11	7.69498E-12	1.66244E-12	4.945[illegible]0E-13
TOTAL (CURIES)				1.42026E-01	6.35264E-03	3.885[illegible]1E-03	1.25348E-03	2.53177E-04	1.10808E-04	2.39391E-05	7.121[illegible]E-06

COMPONENT : CONCRETE - AXIAL UP - SEVENTH 6 INCHES - RS
VOLUME : 1.44000E+07 CC
: ABOVE VOLUME IS FOR THE SEVENTH 6 INCHES OF CONCRETE
: IN THE AXIAL UP DIRECTION.
:
: (INTERVALS 64-66 TOTQUPRS)

NUCLIDE SYM	Z	M	HALF-LIFE (SECONDS)	CONCENTRATION (CURIES/CC) AT T[illegible] SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
H	1	3	3.87233E+08	3.05330E-12	2.57734E-12	2.30201E-12	1.73556E-12	9.86552E-13	5.60784E-13	1.02996E-13	1.07528E-14
HE	2	6	8.09751E-01	2.59738E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
LI	3	8	8.40178E-01	8.08283E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	8	3.00064E-16	6.82641E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	10	7.88563E+13	1.95323E-22	1.95323E-22	1.95323E-22	1.95323E-22	1.95322E-22	1.95322E-22	1.95320E-22	1.95318E-22
B	5	12	1.99754E-02	1.11512E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
C	6	14	1.80970E+11	1.50236E-15	1.50182E-15	1.50145E-15	1.50055E-15	1.49873E-15	1.49692E-15	1.49151E-15	1.48431E-15
F	9	20	1.10025E+01	3.93323E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NE	10	23	3.76710E+01	4.89493E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NA	11	24	5.41621E+04	1.53964E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MG	12	27	5.68153E+02	2.39690E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AL	13	28	1.38629E+02	1.91206E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SI	14	31	9.43057E+03	8.09155E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	2.94432E-13	2.52919E-36	1.06083E-51	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
S	16	35	7.60030E+06	1.98202E-13	5.52647E-17	1.11557E-19	6.27904E-26	1.98915E-38	6.30145E-51	0.00000E+00	0.00000E+00
S	16	37	3.04012E+02	2.30027E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CL	17	36	9.77641E+12	1.45231E-16	1.45230E-16	1.45230E-16	1.45228E-16	1.45225E-16	1.45222E-16	1.45212E-16	1.45199E-16
AR	18	37	3.02604E+06	9.26209E-12	3.55774E-21	1.87996E-27	3.81602E-43	1.57212E-74	0.00000E+00	0.00000E+00	0.00000E+00
AR	18	39	8.48405E+09	3.59067E-14	3.56300E-14	3.54468E-14	3.49927E-14	3.41021E-14	3.32341E-14	3.07604E-14	2.77462E-14
AR	18	41	6.60140E+03	1.13554E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
K	19	40	4.10146E+16	1.95718E-19	1.95718E-19	1.95718E-19	1.95718E-19	1.95718E-19	1.95718E-19	1.95718E-19	1.95718E-19
K	19	42	4.47192E+04	5.31633E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CA	20	41	2.52055E+12	4.16565E-14	4.16555E-14	4.16547E-14	4.16529E-14	4.16493E-14	4.16457E-14	4.16349E-14	4.16204E-14
CA	20	45	1.42623E+07	1.64062E-11	1.64711E-13	7.86599E-15	3.58250E-18	7.82372E-25	1.70861E-31	1.77964E-51	4.04804E-78
CA	20	47	3.91608E+05	8.30316E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	46	7.25049E+06	2.17011E-12	2.54568E-16	6.10031E-19	1.71409E-25	1.35511E-38	1.07080E-51	0.00000E+00	0.00000E+00
SC	21	47	2.96217E+05	1.63136E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	48	1.58263E+05	5.43158E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	49	3.44049E+03	1.93722E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	50	1.03147E+02	1.01276E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	3.48315E+02	2.38283E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	49	2.85246E+07	1.70160E-18	1.70507E-19	3.67844E-20	7.95194E-22	3.71609E-25	1.73662E-28	1.77234E-38	8.45289E-52
V	23	52	2.02084E+02	6.28946E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	53	1.19922E+02	1.25894E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	54	5.50117E+01	1.80941E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39045E+06	9.98049E-13	1.30025E-24	1.56606E-32	2.45985E-52	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	1.06123E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	1.26917E-21	1.26917E-21	1.26917E-21	1.26917E-21	1.26917E-21	1.26917E-21	1.26916E-21	1.26915E-21
MN	25	54	2.61565E+07	1.20079E-12	9.77007E-14	1.83450E-14	2.80265E-16	6.54141E-20	1.52673E-23	1.94115E-34	5.76039E-49
MN	25	56	9.29152E+03	1.46717E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	2.00202E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60[illegible]0E+01	3.01279E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	1.81047E-10	8.13538E-11	4.77246E-11	1.25804E-11	8.74172E-13	6.07434E-14	2.03802E-17	4.75140E-22
FE	26	59	3.89409E+06	2.22219E-12	1.06099E-19	1.40953E-24	8.94090E-37	3.59717E-61	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	60	3.15569E+12	2.96613E-27	2.96607E-27	2.96603E-27	2.96593E-27	2.96572E-27	2.96552E-27	2.96490E-27	2.96408E-27
FE	26	61	3.60001E+02	3.76424E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	57	2.34838E+07	1.17390E-17	7.17086E-19	1.11431E-19	1.05774E-21	9.53674E-26	8.58759E-30	6.28220E-42	4.14092E-58
CO	27	58	6.13405E+06	3.47812E-15	7.85690E-20	6.77856E-23	1.13338E-30	3.69311E-46	1.20340E-61	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	4.24121E-12	2.85620E-12	[illegible].19443E-12	1.13542E-12	3.03965E-13	8.13748E-14	[illegible].56131E-15	8.01969E-18
CO	27	61	5.94007E+03	3.29244E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	62	8.34012E+02	1.70510E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	64	2.99999E-01	1.01353E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NI	28	59	2.52053E+12	1.12355E-17	1.12352E-17	1.12350E-17	1.12345E-17	1.12336E-17	1.12326E-17	1.12297E-17	1.12258E-17
NI	28	63	2.90020E+09	1.74600E-15	1.70693E-15	1.68130E-15	1.61915E-15	1.50152E-15	1.39244E-15	1.11048E-15	8.21272E-16
NI	28	65	9.21738E+03	1.15248E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CU	29	64	4.62098E+04	2.89651E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RB	37	86	1.60972E+06	2.06954E-18	4.00679E-36	6.43262E-48	1.99953E-77	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	87	1.00799E+04	1.14652E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	89	4.50096E+06	6.53202E-17	3.04230E-23	1.82800E-27	7.11575E-38	4.00644E-59	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	90	8.86377E+08	1.60453E-21	1.56433E-21	1.48899E-21	1.31618E-21	1.02832E-21	8.03441E-22	3.83202E-22	1.42799E-22
SR	38	91	3.48315E+04	1.53129E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	92	9.75604E+03	7.40279E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	93	4.50095E+02	3.78698E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	89	1.56970E+01	1.43828E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	90	2.30281E+05	2.79895E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	91	5.09667E+06	1.72536E-17	4.41183E-23	8.25630E-27	3.95543E-36	9.07816E-55	2.08354E-73	0.00000E+00	0.00000E+00
Y	39	92	1.27440E+04	5.41209E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	94	1.12200E+03	1.19411E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	96	9.00406E+00	1.11795E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	88	7.20602E+06	2.60210E-20	2.80662E-24	6.60440E-27	1.70694E-33	1.11969E-46	7.34477E-60	0.00000E+00	0.00000E+00
ZR	40	89	2.82749E+05	2.94010E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	93	4.74[illegible]58E+13	6.15108E-20	6.15106E-20	6.15106E-20	6.15104E-20	6.15102E-20	6.15099E-20	6.15090E-20	6.15079E-20
ZR	40	95	5.63534E+06	2.53556E-16	2.22239E-21	9.44764E-25	3.52025E-33	4.88721E-50	6.78498E-67	0.00000E+00	0.00000E+00
ZR	40	97	6.04840E+04	5.11646E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	91	2.20888E+10	1.11540E-21	1.11209E-21	1.10989E-21	1.10441E-21	1.09352E-21	1.08275E-21	1.05106E-21	1.01024E-21
NB	41	92	8.80746E+05	4.45879E-17	1.95448E-49	5.23483E-71	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	94	6.30134E+11	8.83128E-18	8.83036E-18	8.82975E-18	8.82822E-18	8.82515E-18	8.82209E-18	8.81291E-18	8.80068E-18
NB	41	95	3.02684E+06	5.15767E-18	1.98116E-27	1.04687E-33	2.12490E-49	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	96	8.28132E+04	1.02516E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	97	4.33217E+03	9.43956E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	98	3.06023E+03	2.97150E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	100	3.09994E+00	2.08192E-26	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	93	2.84077E+11	7.83045E-20	7.82864E-20	7.82743E-20	7.82442E-20	7.81840E-20	7.81238E-20	7.79435E-20	7.77038E-20
MO	42	99	2.41515E+05	9.38934E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	101	8.76292E+02	4.51259E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	104	2.61565E+02	2.30411E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	106	7.84813E+03	1.18598E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PD	46	107	2.05134E+14	4.58336E-26	4.58336E-26	4.58336E-26	4.58336E-26	4.58335E-26	4.58335E-26	4.58333E-26	4.5833[illegible]
PD	46	109	4.83704E+04	1.20201E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	106	7.34422E+05	5.29010E-19	8.28530E-58	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	108	4.10389E+09	8.57698E-16	8.44092E-16	8.351[illegible]E-16	8.13179E-16	7.70471E-16	7.30953E-16	6.22958E-16	5.03329E-16
AG	47	110	2.15826E+07	1.44532E-13	6.91013E-15	[illegible]	5.7329[illegible]E-18	2.[illegible]7398[illegible]-22	9.01974E-27	5.62091E-40	1.39334E-57
CD	48	109	3.99508E+07	9.87577E-20	1.91078E-20	[illegible]39[illegible]01E-21	4.[illegible]3718E-22	1.73[illegible]55E-24	7.26050E-27	5.33783E-34	1.64397E-43
CD	48	111	2.92221E+03	2.49607E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	115	1.92541E+05	7.89807E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	117	1.22399E+04	2.40364E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	119	5.97541E+02	1.34845E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	111	2.42444E+05	3.68903E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	112	1.25400E+03	1.99896E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	114	4.27869E+06	3.52322E-20	7.69425E-27	2.79033E-31	2.20994E-42	1.38613E-64	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	115	1.61497E+04	3.99499E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	116	1.40990E+01	1.83762E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	117	6.95931E+03	2.57690E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	118	2.63955E+02	9.61316E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	119	1.26027E+02	9.69419E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	120	4.40093E+01	2.15085E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	122	1.80998E+01	2.94596E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	113	9.94473E+06	1.07824E-16	1.46872E-19	1.80477E-21	3.02091E-26	8.46345E-36	2.37118E-45	5.21443E-74	0.00000E+00
SN	50	121	9.72156E+04	5.40314E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	123	1.07967E+07	7.77974E-16	1.[illegible]8372E-18	3.10147E-20	1.23646E-24	1.96510E-33	3.12311E-42	1.25372E-60	0.00000E+00
SN	50	125	8.12599E+05	9.70024E-15	8.22139E-50	3.41757E-73	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00

I	53	130	4.46981E+04	8.82675E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
XE	54	133	4.56018E+05	4.12401E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	132	5.58990E+05	4.19351E-17	4.35424E-68	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	134	6.47801E+07	4.22794E-13	1.53528E-13	7.81440E-14	1.44432E-14	4.93398E-16	1.68551E-17	6.71961E-22	9.15109E-28
EU	63	152	4.17559E+08	3.70880E-12	3.16963E-12	2.85617E-12	2.19647E-12	1.30082E-12	7.70369E-13	1.60025E-13	1.96859E-14
EU	63	156	2.69812E+08	3.70682E-13	2.90653E-13	2.47146E-13	1.64783E-13	7.32528E-14	3.25638E-14	2.86068E-15	1.11715E-16
LU	71	176	1.22687E+07	1.82454E-23	8.67421E-26	2.45253E-27	3.29670E-31	5.95670E-39	1.07628E-46	6.34879E-70	0.00000E+00
LU	71	177	1.38252E+07	8.08967E-21	7.02071E-23	2.96493E-24	1.08668E-27	1.45972E-34	1.96081E-41	4.75269E-62	0.00000E+00
HF	72	173	8.49653E+04	1.95396E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	175	6.04060E+06	2.28362E-16	4.43347E-19	3.20257E-22	4.49124E-30	8.83276E-46	1.73711E-61	0.00000E+00	0.00000E+00
HF	72	178	9.78261E+08	7.25262E-22	6.76207E-22	6.48545E-22	5.79944E-22	4.63743E-22	3.70824E-22	1.89601E-22	7.75187E-23
HF	72	179	1.89304E+10	3.44594E-23	3.43402E-23	3.42610E-23	3.40637E-23	3.36725E-23	3.32858E-23	3.21522E-23	3.07006E-23
HF	72	180	1.98723E+04	7.38498E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	181	3.66357E+06	1.63172E-13	2.71345E-21	1.76784E-26	1.91536E-39	2.24818E-65	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	182	2.84077E+14	3.63909E-28	3.63909E-28	3.63909E-28	3.63909E-28	3.63909E-28	3.63908E-28	3.63908E-28	3.63906E-28
TA	73	180	2.93658E+04	9.16422E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TA	73	182	9.89[illegible]E+06	2.65808E-13	3.49936E-16	4.20342E-18	6.64734E-23	1.66232E-32	4.15701E-42	6.50113E-71	0.00000E+00
W	74	181	1.20[illegible]E+07	6.77564E-17	2.98544E-19	8.02588E-21	9.50222E-25	1.33258E-32	1.86879E-40	5.15426E-64	0.00000E+00
W	74	185	6.47[illegible]E+06	1.22623E-16	4.88849E-19	5.70482E-22	2.65414E-29	5.74455E-44	1.24335E-58	0.00000E+00	0.00000E+00
W	74	187	8.59984E+04	2.42359E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	203	4.02525E+06	2.55778E-19	2.12674E-26	4.05147E-31	6.41763E-43	1.61013E-66	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	205	3.11947E+02	1.99951E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	204	1.19282E+08	2.60077E-21	1.50030E-21	1.03967E-21	4.15612E-22	6.64162E-23	1.06135E-23	4.33128E-26	[illegible]
TL	81	206	2.52054E+02	4.60620E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	[illegible]
TL	81	207	2.86188E+02	3.74217E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	203	1.86782E+05	1.01685E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	205	4.76390E+14	4.63407E-22	4.63407E-22	4.6[illegible]07E-22	4.63407E-22	4.63407E-22	4.63406E-22	4.63406E-22	4.63405E-22
PB	82	207	7.95989E-01	1.00856E-14	0.00000E+00	0.[illegible]0000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TOTAL (CURIES/CC)				2.03827E-09	9.67493E-11	5.55087E-11	1.79081E-11	3.61894E-12	1.58454E-12	3.43249E-13	1.02899E-13
TOTAL (CURIES)				2.95511E-02	1.30679E-03	7.99325E-04	2.57876E-04	5.21127E-05	2.28173E-05	4.94278E-06	1.48175E-04

COMPONENT : CONCRETE - AXIAL UP - EIGHTH 6 INCHES - R5
VOLUME : 1.44900E+07 CC
: ABOVE VOLUME IS FOR THE EIGHTH 6 INCHES OF CONCRETE
: IN THE AXIAL UP DIRECTION.
:
: (INTERVALS 67-69 TOTOUPR5)

NUCLIDE SYM	Z	N	HALF-LIFE (SECONDS)	CONCENTRATION (CURIES/CC) AT TIME SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
H	1	3	3.87233E+08	6.66614E-13	5.62700E-13	5.02588E-13	3.70922E-13	2.15390E-13	1.22434E-13	2.24867E-14	2.34762E-15
HE	2	6	8.09751E-01	6.11299E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
LI	3	9	8.60178E-01	1.76509E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	8	3.00064E-16	1.69951E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	10	7.08563E+13	4.55396E-23	4.55396E-23	4.55394E-23	4.55393E-23	4.55392E-23	4.55391E-23	4.55387E-23	4.55382E-23
B	5	12	1.99754E-02	2.43472E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
C	6	14	1.80978E+11	3.28148E-16	3.28029E-16	3.27949E-16	3.27751E-16	3.27355E-16	3.26969E-16	3.25776E-16	3.24205E-16
F	9	20	1.10023E+01	9.73725E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NE	10	23	3.76710E+01	1.19649E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NA	11	24	5.41521E+04	3.36524E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MG	12	27	5.68153E+02	5.79376E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AL	13	28	1.38629E+02	4.24075E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SI	14	31	9.43057E+03	1.90123E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	6.94476E-14	5.96561E-37	2.50218E-52	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
S	16	35	7.60030E+06	4.33117E-14	7.70616E-18	1.43778E-20	1.37212E-26	4.34675E-39	1.37701E-51	0.00000E+00	0.00000E+00
S	16	37	3.04012E+02	5.60603E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CL	17	36	9.77641E+12	3.18089E-17	3.18087E-17	3.18086E-17	3.18082E-17	3.18075E-17	3.18068E-17	3.18047E-17	3.18018E-17
AR	18	37	3.02604E+06	2.22604E-12	8.55063E-22	6.51028E-28	9.17135E-44	3.77840E-75	0.00000E+00	0.00000E+00	0.00000E+00
AR	18	39	8.48405E+09	8.05961E-15	7.99751E-15	7.95638E-15	7.85447E-15	7.65455E-15	7.45972E-15	6.90447E-15	6.22790E-15
AR	18	41	6.60140E+03	2.74573E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
K	19	40	4.10146E+16	4.27336E-20	4.27336E-20	4.27336E-20	4.27336E-20	4.27336E-20	4.27336E-20	4.27336E-20	4.27335E-20
K	19	42	4.47192E+04	1.16160E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CA	20	41	2.52053E+12	[illegible].09028E-15	9.09005E-15	9.08909E-15	9.08949E-15	9.08870E-15	9.08792E-15	9.08555E-15	9.08240E-15
CA	20	45	1.42623E+07	[illegible].58400E-12	3.59862E-14	1.67488E-15	7.82710E-19	1.70934E-25	3.73299E-32	3.88810E-52	8.04420E-79
CA	20	47	3.91608E+05	1.82194E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	46	7.25049E+06	4.74654E-13	5.56800E-17	1.33428E-19	3.75086E-26	2.96395E-39	2.34210E-52	0.00000E+00	0.00000E+00
SC	21	47	2.96217E+05	3.85247E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	48	1.58253E+05	1.33854E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	49	3.44849E+03	4.66550E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	50	1.03147E+02	2.52463E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	3.48315E+02	5.20630E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	49	2.85246E+07	4.24326E-19	4.25191E-20	9.17290E-21	1.98297E-22	9.26678E-26	4.33059E-29	4.41965E-39	2.10789E-52
V	23	52	2.02084E+02	1.37398E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	53	1.19922E+02	3.07579E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	54	5.50117E+01	4.51129E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39843E+06	2.19582E-13	[illegible]7815E-25	3.44710E-33	5.41167E-53	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	2.56315E-14	[illegible].00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	3.16493E-22	3.16493E-22	3.16492E-22	3.16492E-22	3.16492E-22	3.16491E-22	3.16489E-22	3.16487E-22
MN	25	54	2.61565E+07	2.84768E-13	2.31697E-14	4.35051E-15	6.64647E-17	1.55130E-20	3.62065E-24	4.60343E-35	1.36608E-49
MN	25	56	9.29152E+03	3.16278E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	4.86926E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	7.49839E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	3.95110E-11	1.77537E-11	1.04152E-11	2.74550E-12	1.90776E-13	1.32564E-14	4.44769E-18	1.03693E-22
FE	26	59	3.89409E+06	4.85730E-13	2.33225E-20	3.08097E-25	1.95431E-37	7.86273E-62	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	60	3.15569E+12	7.39444E-28	7.39429E-28	7.39419E-28	7.39393E-28	7.39342E-28	7.39291E-28	7.39137E-28	7.38932E-28
FE	26	61	3.60001E+02	9.23704E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	57	2.34830E+07	2.92689E-18	1.78991E-19	2.77831E-20	2.63728E-22	2.37631E-26	2.14115E-30	1.56635E-42	1.03246E-58
CO	27	58	6.13405E+06	8.22755E-16	1.85856E-20	1.48520E-23	2.68103E-31	8.73612E-47	2.84666E-62	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	9.27605E-13	6.24688E-13	4.79951E-13	2.48331E-13	6.64809E-14	1.77977E-14	3.41679E-16	1.75401E-18
CO	27	61	5.94007E+03	7.95330E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	62	8.34012E+02	4.20216E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00

CO	27	60	2.99999E-01	2.52738E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NI	28	59	2.52053E-12	2.45341E-18	2.45335E-18	2.45331E-18	2.45320E-18	2.45299E-18	2.45277E-18	2.45214E-18	2.45178E-18
NI	28	63	2.95020E+09	3.83764E-16	3.75178E-16	3.69562E-16	3.55084E-16	3.30030E-16	3.06054E-16	2.44079E-16	1.80513E-16
NI	28	65	9.21738E+03	2.78656E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CU	29	64	4.62098E+04	6.32748E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RB	37	86	1.60972E+06	5.14350E-19	1.01570E-36	1.59672E-48	4.96952E-78	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	87	1.00799E+04	2.83672E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	89	4.50096E+06	1.59325E-17	7.42057E-24	4.45072E-28	1.24760E-38	9.77223E-60	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	90	8.86377E+08	4.16239E-22	3.85607E-22	3.67037E-22	3.24431E-22	2.53482E-22	1.98049E-22	9.44595E-23	3.52001E-23
SR	38	91	3.48316E+04	3.78822E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	92	9.75604E+03	1.04337E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	93	4.50095E+02	9.43061E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	89	1.56998E+01	3.58224E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	90	2.30281E+05	6.11151E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	91	5.09667E+06	4.22442E-18	1.00146E-23	2.02384E-27	9.69581E-37	2.22530E-55	5.10731E-74	0.00000E+00	0.00000E+00
Y	39	92	1.27440E+04	1.33553E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	94	1.12200E+03	2.96455E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	96	9.80406E+00	2.78776E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	88	7.20602E+06	6.33943E-21	7.03260E-25	1.62365E-27	4.15857E-34	2.72787E-47	1.78939E-60	0.00000E+00	0.00000E+00
ZR	40	89	2.82249E+05	7.23508E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	93	4.74758E+13	1.34848E-20	1.34848E-20	1.34848E-20	1.34847E-20	1.34847E-20	1.34846E-20	1.34844E-20	1.34842E-20
ZR	40	95	5.63534E+06	6.32170E-17	5.54098E-22	2.35554E-25	8.77688E-34	1.21851E-56	1.69167E-67	0.00000E+00	0.00000E+00
ZR	40	97	4.04840E+04	1.15611E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	91	2.20688E+10	2.77427E-22	2.76604E-22	2.76057E-22	2.74693E-22	2.71987E-22	2.69307E-22	2.61424E-22	2.51271E-22
NB	41	92	8.80746E+05	1.10282E-17	4.83413E-50	1.29476E-71	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	94	6.30134E+11	1.94313E-18	1.94293E-18	1.94279E-18	1.94245E-18	1.94178E-18	1.94111E-18	1.93909E-18	1.93640E-18
NB	41	95	3.02684E+06	1.26228E-18	4.04866E-28	2.56211E-34	5.20065E-50	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	96	8.28132E+04	2.52780E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	97	4.33217E+03	2.31837E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	98	3.06025E+03	7.37043E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	100	3.69994E+00	5.19020E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	93	2.84077E+11	1.77020E-20	1.76988E-20	1.76960E-20	1.76892E-20	1.76756E-20	1.76620E-20	1.76213E-20	1.75671E-20
MO	42	99	2.41515E+05	2.07961E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	101	8.76292E+02	1.00453E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	104	2.61565E+02	5.70518E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	106	7.84813E+03	2.90476E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PD	46	107	2.05134E+14	1.12555E-26	1.12555E-26	1.12555E-26	1.12555E-26	1.12555E-26	1.12554E-26	1.12554E-26	1.12554E-26
PD	46	109	4.83704E+04	2.94962E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	106	7.34422E+05	1.31919E-19	2.06609E-58	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	108	4.10389E+09	1.87791E-16	1.84813E-16	1.82853E-16	1.78044E-16	1.68803E-16	1.60041E-16	1.36391E-16	1.10203E-16
AG	47	110	2.15826E+07	3.17918E-14	1.51998E-15	2.00226E-16	1.26104E-18	5.00194E-23	1.90402E-27	1.23816E-40	3.06404E-58
CD	48	109	3.99508E+07	2.42194E-20	4.68600E-21	1.56758E-21	1.01460E-22	4.25038E-25	1.70059E-27	1.30905E-34	4.03168E-44
CD	48	111	2.92221E+03	6.15020E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	115	1.92541E+05	1.96273E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	117	1.22399E+04	5.99308E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	119	5.97541E+02	3.36263E-24	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	111	2.42444E+05	9.16918E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	112	1.26400E+03	4.90230E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	114	4.27869E+06	8.67120E-21	1.89369E-27	6.86748E-32	5.43905E-43	3.41151E-65	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	115	1.61497E+04	9.00025E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	116	1.40998E+01	4.54335E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	117	6.95931E+03	6.33180E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	118	2.63955E+02	2.58674E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	119	1.26027E+02	2.38853E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	120	4.40093E+01	5.36215E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	122	1.00998E+01	7.34630E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	113	9.94473E+06	2.43676E-17	3.31921E-20	4.07866E-22	6.82705E-27	1.91268E-36	5.35870E-46	1.17843E-74	0.00000E+00
SN	50	121	9.72156E+04	1.10019E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	123	1.07967E+07	1.72008E-16	3.94360E-19	6.85714E-21	2.73373E-25	4.34669E-34	6.90497E-43	2.77190E-69	0.00000E+00
SN	50	125	8.12599E+05	2.13291E-15	1.00774E-50	7.51463E-74	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
I	53	130	4.64901E+04	2.16305E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
XE	54	133	4.56010E+05	1.00598E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	132	5.58990E+05	1.04573E-17	1.08581E-60	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	134	6.47801E+07	9.29397E-14	3.37690E-14	1.71778E-14	3.17695E-15	1.08460E-16	3.70513E-18	1.47710E-22	2.01162E-28
EU	63	152	4.17559E+08	8.09604E-13	6.91761E-13	6.22952E-13	4.79403E-13	2.03918E-13	1.68145E-13	3.49270E-14	4.29665E-15
EU	63	154	2.69812E+08	8.11278E-14	6.36204E-14	5.60977E-14	3.60691E-14	1.60342E-14	7.12783E-15	6.26167E-16	2.64531E-17
LU	71	176	1.22687E+07	4.30431E-26	2.08438E-26	5.09335E-28	7.92106E-32	1.43138E-39	2.58627E-47	1.52559E-70	0.00000E+00
LU	71	177	1.38242E+07	1.98396E-21	1.72100E-23	7.27150E-25	2.66504E-28	3.57991E-35	4.00881E-42	1.16558E-62	0.00000E+00
HF	72	173	8.49653E+04	4.07257E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	175	6.84040E+06	5.08350E-15	9.71390E-20	7.01685E-23	9.80049E-31	1.93529E-46	3.80607E-62	0.00000E+00	0.00000E+00
HF	72	178	9.78261E+00	1.78654E-22	1.67063E-22	1.59757E-22	1.42858E-22	1.16234E-22	9.13455E-23	4.67847E-23	1.90953E-23
HF	72	179	1.89384E+10	8.46730E-24	8.43807E-24	8.41060E-24	8.37012E-24	8.27400E-24	8.17090E-24	7.90043E-24	7.54373E-24
HF	72	180	1.98723E+04	1.02106E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	181	3.66357E+06	3.60506E-14	5.99600E-22	3.90579E-27	4.23174E-40	4.96706E-66	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	182	2.84077E+16	8.99201E-29	8.99200E-29	8.99200E-29	8.99200E-29	8.99198E-29	8.99196E-29	8.99196E-29	8.99194E-29
TA	73	180	2.93458E+04	2.26086E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TA	73	182	9.89362E+06	5.86730E-14	7.72431E-17	9.27039E-19	1.66730E-23	3.66932E-33	9.17597E-43	1.63502E-71	0.00000E+00
W	74	181	1.20968E+07	1.68960E-17	7.04467E-20	2.00087E-21	2.36952E-25	3.32290E-33	4.66011E-41	1.28529E-64	0.00000E+00
W	74	185	6.47001E+06	2.70576E-15	1.07867E-19	1.25079E-22	5.05646E-30	1.26756E-44	2.74351E-59	0.00000E+00	0.00000E+00
W	74	187	8.59904E+04	5.32609E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	203	4.02525E+06	6.32708E-20	5.26088E-27	1.00220E-31	1.58751E-43	5.98791E-67	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	205	3.11947E+02	4.97091E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	204	1.19282E+08	6.41270E-22	3.69932E-22	2.56355E-22	1.02478E-22	1.63764E-23	2.61700E-26	1.06797E-26	6.96470E-30
TL	81	206	2.52054E+02	1.14048E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	207	2.86100E+02	9.26237E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	203	1.86702E+05	2.83699E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	205	4.76390E+14	1.15532E-22	1.15532E-22	1.15532E-22	1.15532E-22	1.15532E-22	1.15532E-22	1.15532E-22	1.15532E-22
PB	82	207	7.95999E-01	2.51232E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TOTAL (CURIES/CC)				6.66356E-10	1.98090E-11	1.21162E-11	3.90931E-12	7.90313E-13	3.46141E-13	7.51163E-16	2.26319E-14
TOTAL (CURIES)				6.62750E-[illegible]	2.05249E-04	1.76473E-04	5.62940E-05	1.13808E-05	4.98443E-06	1.08170E-06	3.25909E-07

COMPONENT : CONCRETE - AXIAL DOWN - FIRST 6 INCHES - R5
VOLUME : 9.67700E+06 CC
: ABOVE VOLUME IS FOR THE FIRST 6 INCHES OF CONCRETE
: IN THE AXIAL DOWN DIRECTION.
:
: (INTERVALS 56-58 TOTGDNRS)

NUCLIDE SYM	Z	M	HALF-LIFE (SECONDS)	CONCENTRATION (CURIES/CC) AT TIME SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
H	1	3	3.87233E+08	1.97585E-08	1.66616E-08	1.48816E-08	1.12199E-08	6.37770E-09	3.62527E-09	6.65833E-10	6.95131E-11
HE	2	6	8.09751E-01	3.96202E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
LI	3	8	8.40178E-01	5.21651E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	8	3.00064E-16	1.03635E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	10	7.88563E+13	2.20994E-19	2.20993E-19	2.20993E-19	2.20993E-19	2.20992E-19	2.20992E-19	2.20990E-19	2.20988E-19
B	5	12	1.99754E-02	7.19708E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
C	6	14	1.80978E+11	9.64761E-12	9.644.1E-12	9.64178E-12	9.63596E-12	9.62432E-12	9.61269E-12	9.57790E-12	9.53171E-12
F	9	20	1.10023E+01	3.65318E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NE	10	23	3.76710E+01	5.67986E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NA	11	24	5.41521E+04	9.84087E-07	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MG	12	27	5.68153E+02	2.93121E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AL	13	28	1.38629E+02	1.06730E-06	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SI	14	31	9.43057E+03	1.15610E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	4.15802E-11	3.57177E-36	1.49813E-49	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
S	16	35	7.60030E+06	1.26848E-09	2.25693E-13	7.13959E-16	4.01856E-22	1.27305E-34	4.03290E-47	0.00000E+00	0.00000E+00
S	16	37	3.04012E+02	2.60916E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CL	17	36	9.77641E+12	9.03493E-13	9.03487E-13	9.03483E-13	9.03473E-13	9.03453E-13	9.03433E-13	9.03372E-13	9.03291E-13
AR	18	37	3.02684E+06	1.16855E-09	4.48863E-19	2.37186E-25	4.81448E-41	1.98346E-72	0.00000E+00	0.00000E+00	0.00000E+00
AR	18	39	8.48405E+09	1.50243E-10	1.49085E-10	1.48319E-10	1.46419E-10	1.42692E-10	1.39060E-10	1.28710E-10	1.16097E-10
AR	18	41	6.60140E+03	1.39900E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
K	19	40	4.10146E+16	1.26188E-15	1.26188E-15	1.26188E-15	1.26188E-15	1.26188E-15	1.26188E-15	1.26188E-15	1.26188E-15
K	19	42	4.47192E+04	3.39131E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CA	20	41	2.52053E+12	2.71101E-10	2.71094E-10	2.71089E-10	2.71077E-10	2.71054E-10	2.71031E-10	2.70960E-10	2.70866E-10
CA	20	45	1.42623E+07	1.04361E-07	1.04787E-09	4.87701E-11	2.27914E-14	4.97735E-21	1.08700E-27	1.13219E-47	2.57531E-74
CA	20	47	3.9 608E+05	5.40284E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	46	7.25049E+06	1.37290E-08	1.61051E-12	3.85932E-15	1.08491E-21	8.57303E-35	6.77436E-48	0.00000E+00	0.00000E+00
SC	21	47	2.96217E+05	2.32320E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	48	1.58253E+05	5.36761E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	49	3.44849E+03	2.46904E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	50	1.03147E+02	8.45262E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	3.48315E+02	1.52648E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	49	2.85246E+07	1.41203E-16	1.41490E-17	3.05246E-18	6.59871E-20	3.08370E-23	1.44109E-26	1.47073E-36	7.01441E-50
V	23	52	2.02084E+02	4.04310E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	53	1.19922E+02	1.38705E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	54	5.50117E+01	1.50612E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39843E+06	5.91303E-09	7.75046E-21	9.28256E-29	1.45729E-48	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	1.32359E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	1.05321E-19	1.05321E-19	1.05321E-19	1.05321E-19	1.05321E-19	1.05321E-19	1.05320E-19	1.05319E-19
MN	25	54	2.61565E+07	1.66531E-10	1.35496E-11	2.54416E-12	3.88683E-14	9.07192E-18	2.11734E-21	2.69207E-32	7.98877E-47
MN	25	56	9.29152E+03	9.17210E-06	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	2.31813E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	2.58068E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	1.17646E-06	5.28624E-07	3.10118E-07	8.17485E-08	5.68044E-09	3.94716E-10	1.32432E-13	3.08750E-18
FE	26	59	3.89409E+06	1.40356E-08	6.75924E-16	8.90275E-21	5.64717E-33	2.27201E-57	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	60	3.15569E+12	2.47339E-25	2.47334E-25	2.47331E-25	2.47322E-25	2.47305E-25	2.47288E-25	2.47236E-25	2.47168E-25
FE	26	61	3.60001E+02	3.07493[illegible]-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	57	2.34838E+07	9.76610E-16	5.97234E-17	9.27031E-18	8.79974E-20	7.92897E-24	7.14433E-28	5.22639E-40	3.44498E-56
CO	27	58	6.13405E+06	4.90799E-13	1.10869E-17	8.85970E-21	1.59932E-28	5.21137E-44	1.69812E-59	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	2.64327E-08	1.78009E-08	1.36765E-08	7.07635E-09	1.89442E-09	5.07157E-10	9.73068E-12	4.99816E-14
CO	27	61	5.94007E+03	4.05308E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	62	8.34012E+02	1.68688E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	64	2.99999E-01	8.41414E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NI	28	59	2.52053E+12	7.24276E-14	7.24258E-14	7.24245E-14	7.24213E-14	7.24151E-14	7.24088E-14	7.23900E-14	7.23648E-14
NI	28	63	2.90020E+09	1.03466E-11	1.01151E-11	9.96367E-12	9.59492E-12	8.89787E-12	8.25145E-12	6.58057E-12	4.86677E-12
NI	28	65	9.21738E+03	1.41715E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CU	29	64	4.62098E+04	1.85017E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RB	37	86	1.60472E+06	1.81307E-16	3.58032E-34	5.63544E-46	1.75174E-75	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	87	1.00799E+04	1.07452E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	89	4.50096E+06	7.30879E-15	3.40408E-21	2.04537E-25	5.72410E-36	4.48287E-57	3.51074E-78	0.00000E+00	0.00000E+00
SR	38	90	8.86377E+08	1.60063E-19	1.54212E-19	1.46788E-19	1.29747E-19	1.01373E-19	7.92037E-20	3.77763E-20	1.40773E-20
SR	38	91	3.48315E+04	1.43793E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	92	9.75604E+03	6.28991E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	93	4.50095E+02	3.17099E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	89	1.56998E+01	1.21541E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	90	2.30281E+05	1.80460E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	91	5.09667E+06	1.02001E-15	4.65923E-21	8.71930E-25	4.17724E-34	9.58721E-53	2.20038E-71	0.00000E+00	0.00000E+00
Y	39	92	1.27440E+04	5.26080E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	94	1.12200E+03	1.06374E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	96	9.80406E+00	9.28112E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	88	7.20602E+06	2.96325E-18	3.28725E-22	7.58944E-25	1.94304E-31	1.27509E-44	8.36415E-58	0.00000E+00	0.00000E+00
ZR	40	89	2.82249E+05	2.96094E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	93	4.74758E+13	3.00545E-16	3.00545E-16	3.00544E-16	3.00544E-16	3.00542E-16	3.00540E-16	3.00535E-16	3.00528E-16
ZR	40	95	5.63534E+06	2.11021E-14	1.04958E-19	7.86279E-23	2.92973E-31	4.06738E-48	5.64680E-65	0.00000E+00	0.00000E+00
ZR	40	97	6.04840E+04	9.41404E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	91	2.20888E+10	9.65321E-20	9.62457E-20	9.60553E-20	9.55809E-20	9.46390E-20	9.37064E-20	9.09636E-20	8.74308E-20
NB	41	92	8.80746E+05	4.16293E-15	1.82679E-47	4.88748E-69	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	94	6.30134E+11	4.76142E-14	4.76092E-14	4.76059E-14	4.75977E-14	4.75812E-14	4.75646E-14	4.75151E-14	4.74492E-14
NB	41	95	3.02684E+06	5.53838E-16	2.12740E-25	1.12415E-31	2.28183E-47	9.40066E-79	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	96	8.28132E+04	1.80622E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	97	4.33217E+03	9.74243E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	98	3.06025E+03	2.68448E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	100	3.09994E+00	1.73569E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	93	2.84077E+11	5.89123E-17	5.88987E-17	5.88896E-17	5.88670E-17	5.88216E-17	5.87764E-17	5.86407E-17	5.84604E-17
MO	42	99	2.41515E+05	3.18711E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	101	8.76292E+02	1.75479E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	104	2.61565E+02	2.13461E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	106	7.84813E+03	1.27086E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PD	46	107	2.05134E+14	4.73471E-24	4.73471E-24	4.73471E-24	4.73471E-24	4.73470E-24	4.73470E-24	4.73468E-24	4.73466E-24
PD	46	109	4.83704E+04	1.25271E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	106	7.34422E+05	4.38986E-17	6.87535E-56	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	108	4.10389E+09	5.18252E-12	5.10031E-12	5.04623E-12	4.91352E-12	4.65849E-12	4.41669E-12	3.76402E-12	3.04130E-12
AG	47	110	2.15826E+07	7.38210E-16	3.52941E-11	4.64926E-12	2.92814E-14	1.16145E-18	4.60692E-23	2.87502E-36	7.11660E-54
CD	48	109	3.99508E+07	1.03781E-17	2.00798E-18	6.71717E-19	4.34764E-20	1.82131E-22	7.62992E-25	5.60937E-32	1.72766E-41
CD	48	111	2.92221E+03	2.47190E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	115	1.92541E+05	6.92995E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	117	1.22399E+04	1.99499E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	119	5.97541E+02	1.11898E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	111	2.42444E+05	3.22790E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	112	1.25400E+03	2.09509E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	114	4.27069E+06	3.54097E-18	7.73306E-25	2.80441E-29	2.22109E-40	1.39312E-62	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	115	1.61497E+04	4.17018E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	116	1.40998E+01	1.73946E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	117	6.95931E+03	2.64395E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	118	2.63955E+02	8.55605E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	119	1.26027E+02	9.60943E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	120	4.40093E+01	1.79258E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	122	1.00998E+01	2.44462E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	113	9.94473E+06	8.73442E-14	1.18976E-16	1.46198E-18	2.44713E-23	6.85595E-33	1.92081E-42	4.22404E-71	0.00000E+00
SN	50	121	9.72156E+04	2.93611E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	123	1.07967E+07	4.15704E-12	9.53116E-15	1.65725E-16	6.60693E-21	1.05003E-29	1.66881E-38	6.69917E-65	0.00000E+00
SN	50	125	8.12599E+05	5.33425E-11	4.53796E-46	1.80640E-69	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00

I	53	130	4.46981E+04	9.39620E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
XE	54	133	4.56018E+05	4.59706E-16	1.46670E-78	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	132	5.58990E+05	3.47980E-15	3.31326E-66	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	134	6.47801E+07	2.22676E-09	8.07874E-10	4.11197E-10	7.65008E-11	2.59628E-12	8.86522E-14	3.53584E-18	4.81535E-24
EU	63	152	4.17559E+08	2.40920E-08	2.05690E-08	1.85610E-08	1.42685E-08	8.45028E-09	5.00453E-09	1.03954E-09	1.27862E-10
EU	63	154	2.69812E+08	2.28151E-09	1.76894E-09	1.52117E-09	1.01422E-09	4.50864E-10	2.00427E-10	1.76072E-11	6.87598E-13
LU	71	176	1.22687E+07	2.38092E-21	1.13194E-23	3.20061E-25	4.30201E-29	7.77316E-37	1.40468E-44	8.28481E-68	0.00000E+00
LU	71	177	1.38242E+07	8.48996E-19	7.36810E-21	3.11164E-22	1.14645E-25	1.53195E-32	2.05783E-39	4.98786E-60	0.00000E+00
HF	72	173	8.49653E+04	1.62144E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	175	6.04840E+06	1.39766E-10	2.71345E-15	1.96006E-18	2.74881E-26	5.40599E-42	1.06317E-57	0.00000E+00	0.00000E+00
HF	72	178	9.78261E+08	7.20467E-20	6.73724E-20	6.44258E-20	5.76110E-20	4.60677E-20	3.68373E-20	1.88348E-20	7.70062E-21
HF	72	179	1.09384E+10	3.53072E-21	3.51850E-21	3.51039E-21	3.49017E-21	3.45009E-21	3.41047E-21	3.29432E-21	3.14559E-21
HF	72	180	1.98723E+04	7.24177E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	181	3.66357E+06	8.59221E-10	1.42083E-17	9.30895E-23	1.00850E-35	1.18383E-61	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	182	2.84077E+14	3.47138E-26	3.47138E-26	3.47138E-26	3.47138E-26	3.47137E-26	3.47137E-26	3.47136E-26	3.47135E-26
TA	73	180	2.93458E+04	7.63534E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TA	73	182	9.89362E+06	1.21792E-09	1.60339E-12	1.92598E-14	3.04570E-19	7.61667E-29	1.90472E-38	2.97870E-67	0.00000E+00
W	74	181	1.20968E+07	5.62441E-15	[illegible]	6.66056E-19	7.88772E-23	1.10616E-30	1.55127E-38	4.27851E-62	0.00000E+00
W	74	185	6.47801E+06	6.36717E-11	[illegible]	2.96221E-18	1.37815E-25	2.98283E-40	6.45605E-55	0.00000E+00	0.00000E+00
W	74	187	8.59984E+04	1.26399E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	203	4.02525E+06	2.40445E-17	1.99926E-24	[illegible]	6.03292E-41	1.51361E-64	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	205	3.11947E+02	1.74350E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	204	1.19262E+08	2.55009E-19	1.47106E-19	[illegible]	4.07513E-20	6.51219E-21	1.04067E-21	4.24687E-24	2.76956E-27
TL	81	206	2.52054E+02	4.24971E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	207	2.86188E+02	3.59525E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	203	1.86782E+05	8.43966E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	205	4.76390E+14	3.86069E-20	3.86069E-20	3.86069E-20	3.86069E-20	3.86069E-20	3.86068E-20	3.86068E-20	3.86067E-20
PB	82	207	7.95989E-01	[illegible]	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TOTAL (CURIES/CC)				1.27176E-05	5.87818E-07	3.59651E-07	1.15846E-07	2.32942E-08	1.01656E-08	2.15346E-09	6.03559E-10
TOTAL (CURIES)				1.23068E+02	5.68831E+00	3.48034E+00	1.12104E+00	2.25418E-01	9.83722E-02	2.08390E-02	5.84064E-03

COMPONENT : CONCRETE - AXIAL DOWN - SECOND 6 INCHES - R5
VOLUME : 9.67700E+06 CC
: ABOVE VOLUME IS FOR THE SECOND 6 INCHES OF CONCRETE
: IN THE AXIAL DOWN DIRECTION.
:
: (INTERVALS 59-61 TOTGDNRS)

NUCLIDE SYM	Z	M	HALF-LIFE (SECONDS)	CONCENTRATION (CURIES/CC) AT TIME SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
H	1	3	3.87233E+08	1.31742E-09	1.11206E-09	9.93259E-10	7.48859E-10	4.25672E-10	2.41964E-10	4.44403E-11	4.63957E-12
HE	2	6	8.09751E-01	8.33145E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
LI	3	8	8.40178E-01	3.48179E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	8	3.06064E-16	2.16537E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	10	7.88563E+13	1.80963E-20	1.80963E-20	1.80963E-20	1.80963E-20	1.80962E-20	1.80962E-20	1.80960E-20	1.80958E-20
B	5	12	1.99756E-32	4.80344E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
C	6	14	1.80978E+11	6.44122E-13	6.43869E-13	6.43733E-13	6.43344E-13	6.42567E-13	6.41791E-13	6.39468E-13	6.36384E-13
F	9	20	1.10023E+01	8.45318E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NE	10	23	3.76710E+01	1.25812E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NA	11	24	5.41521E+04	6.56856E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MG	12	27	5.68153E+02	6.42669E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AL	13	28	1.38629E+02	7.16977E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SI	14	31	9.43057E+03	2.47844E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	8.91153E-12	7.65507E-35	3.21080E-50	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
S	16	35	7.60050E+06	8.47821E-11	1.50847E-16	4.77192E-17	2.68591E-23	8.50872E-36	2.69549E-48	0.00000E+00	0.00000E+00
S	16	37	3.04012E+02	5.00608E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CL	17	36	9.77641E+12	6.02667E-14	6.02664E-14	6.02661E-14	6.02654E-14	6.02641E-14	6.02627E-14	6.02587E-14	6.02533E-14
AR	18	37	3.02684E+06	2.54925E-10	9.79215E-20	5.17432E-26	1.05030E-41	4.32701E-73	0.00000E+00	0.00000E+00	0.00000E+00
AR	18	39	8.48405E+09	1.02986E-11	1.02193E-11	1.01667E-11	1.00365E-11	9.78102E-12	9.53207E-12	8.82258E-12	7.95805E-12
AR	18	41	6.60140E+03	3.06022E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
K	19	40	4.10166E+16	8.42188E-17	8.42188E-17	8.42188E-17	8.42188E-17	8.42188E-17	8.42188E-17	8.42188E-17	8.42188E-17
K	19	42	4.47192E+04	2.26287E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CA	20	41	2.52053E+12	1.81169E-11	1.81166E-11	1.81161E-11	1.81153E-11	1.81138E-11	1.81122E-11	1.81075E-11	1.81012E-11
CA	20	45	1.42623E+07	6.96798E-09	6.99642E-11	3.25628E-12	1.52174E-15	3.32328E-22	7.25766E-29	7.55936E-49	1.71948E-75
CA	20	47	3.91608E+05	3.61057E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	46	7.25049E+06	9.14862E-10	1.07319E-13	2.57174E-16	7.22952E-23	5.71281E-36	4.51423E-49	0.00000E+00	0.00000E+00
SC	21	47	2.96217E+05	4.90433E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	48	1.58253E+05	1.22605E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	49	3.44849E+03	5.36498E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	50	1.03147E+02	1.99761E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	3.48315E+02	1.01879E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	49	2.85246E+07	3.34087E-17	3.34788E-18	7.22216E-19	1.56126E-20	7.29608E-24	3.40963E-27	3.47976E-37	1.65962E-50
V	23	52	2.02084E+02	2.69880E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	53	1.19922E+02	3.10236E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	54	5.50117E+01	3.56130E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39843E+06	3.93966E-10	5.16388E-22	6.18467E-30	9.70944E-50	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	2.09075E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	2.49190E-20	2.49190E-20	2.49190E-20	2.49190E-20	2.49189E-20	2.49189E-20	2.49187E-20	2.49186E-20
MN	25	54	2.61565E+07	3.57811E-11	2.91127E-12	5.46642E-13	8.35129E-15	1.94920E-18	4.54934E-22	5.78421E-33	1.71647E-47
MN	25	56	9.29152E+03	6.11377E-07	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	5.13036E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	6.06791E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	7.06180E-08	3.53259E-08	2.07240E-08	5.46293E-09	3.79601E-10	2.63773E-11	8.84990E-15	2.06325E-19
FE	26	59	3.89409E+06	9.35539E-10	4.49262E-17	5.93410E-22	3.76410E-34	1.51440E-58	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	60	3.15569E+12	5.84641E-26	5.84629E-26	5.84621E-26	5.84601E-26	5.84560E-26	5.84519E-26	5.84398E-26	5.84236E-26
FE	26	61	3.60001E+02	7.27482E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	57	2.34838E+07	2.30950E-16	1.41235E-17	2.19226E-18	2.08098E-20	1.87505E-24	1.68950E-28	1.23594E-40	8.14675E-57
CO	27	58	6.13405E+06	1.04595E-13	2.36275E-18	1.88811E-21	3.40834E-29	1.11061E-44	3.61891E-60	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	1.75937E-09	1.10483E-09	9.10313E-10	4.71004E-10	1.26093E-10	3.37565E-11	6.47677E-13	3.32679E-15
CO	27	61	5.94007E+03	8.06738E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	62	8.34012E+02	5.85598E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00

CO	27	60	2.90990E-01	1.99062E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NI	28	59	2.52053E+12	4.83288E-15	4.83275E-15	4.83267E-15	4.83246E-15	4.83204E-15	4.83162E-15	4.83036E-15	4.82869E-15
NI	28	63	2.90020E+09	6.96321E-13	6.78788E-13	6.68625E-13	6.43880E-13	5.97103E-13	5.53724E-13	4.41598E-13	3.26591E-13
NI	28	65	9.21738E+03	3.09688E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CU	29	64	4.62098E+04	1.23444E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RB	37	86	1.60972E+06	4.24468E-17	8.36209E-35	1.31934E-46	4.10108E-76	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	87	1.00799E+04	2.48351E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	89	4.50096E+06	1.62677E-15	7.57669E-22	4.55253E-26	1.27405E-36	9.97783E-58	7.81409E-79	0.00000E+00	0.00000E+00
SR	38	90	8.86377E+08	3.79652E-20	3.52560E-20	3.35581E-20	2.96627E-20	2.31758E-20	1.81075E-20	8.63641E-21	3.21834E-21
SR	38	91	3.48315E+04	3.32231E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	92	9.75604E+03	1.48128E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	93	4.50095E+02	7.48920E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	89	1.56998E+01	2.86628E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	90	2.30281E+05	1.20446E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	91	5.09667E+06	4.09811E-16	1.04912E-21	1.96332E-25	9.40590E-35	2.15876E-53	4.95466E-72	0.00000E+00	0.00000E+00
Y	39	92	1.27440E+04	1.20671E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	94	1.12200E+03	2.48236E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	96	9.80408E+00	2.19573E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	88	7.20602E+06	6.58943E-19	7.30993E-23	1.68768E-25	4.32256E-32	2.83545E-45	1.85995E-58	0.00000E+00	0.00000E+00
ZR	40	89	2.82249E+05	6.73486E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	93	4.74758E+13	2.54178E-17	2.54177E-17	2.54177E-17	2.54176E-17	2.54175E-17	2.54174E-17	2.54170E-17	2.54166E-17
ZR	40	95	5.63534E+06	4.98985E-15	4.37556E-20	1.85925E-23	6.97769E-32	9.61780E-49	1.33525E-65	0.00000E+00	0.00000E+00
ZR	40	97	6.04840E+04	5.15169E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	91	2.20888E+10	2.26525E-20	2.25853E-20	2.25407E-20	2.24293E-20	2.22083E-20	2.19895E-20	2.13458E-20	2.05168E-20
NB	41	92	8.80746E+05	9.60298E-16	4.20940E-48	1.12744E-69	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	94	6.30134E+11	3.14758E-15	3.14725E-15	3.14703E-15	3.14649E-15	3.14539E-15	3.14430E-15	3.14103E-15	3.13667E-15
NB	41	95	3.02684E+06	1.24298E-16	4.77454E-26	2.52294E-32	5.12114E-48	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	96	8.28132E+04	2.30198E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	97	4.33217E+03	2.20440E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	98	3.06025E+03	6.24777E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	100	3.09994E+00	4.10288E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	93	2.84077E+11	3.69809E-18	3.69803E-18	3.69746E-18	3.69604E-18	3.69319E-18	3.69035E-18	3.68184E-18	3.67051E-18
MO	42	99	2.41515E+05	2.06929E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	101	8.76292E+02	1.14077E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	104	2.61565E+02	4.94233E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	106	7.84813E+03	2.86250E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PD	46	107	2.05134E+14	1.07038E-24	1.07038E-24	1.07038E-24	1.07038E-24	1.07038E-24	1.07037E-24	1.07037E-24	1.07037E-24
PD	46	109	4.83704E+04	2.82638E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	106	7.34422E+05	1.03864E-17	1.62671E-56	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	108	4.10389E+09	3.45997E-13	3.38540E-13	3.34950E-13	3.26142E-13	3.09213E-13	2.93163E-13	2.49842E-13	2.01870E-13
AG	47	110	2.15826E+07	4.79071E-11	2.29046E-12	3.01720E-13	1.90026E-15	7.53742E-20	2.98972E-24	1.86578E-37	4.61841E-55
CD	48	109	3.99508E+07	2.33887E-18	4.52528E-19	1.51381E-19	9.79804E-21	4.20459E-23	1.71951E-25	1.26415E-32	3.89340E-42
CD	48	111	2.92221E+03	5.64324E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	115	1.92541E+05	1.62172E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	117	1.22399E+04	4.71998E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	119	5.97541E+02	2.64752E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	111	2.42444E+05	7.55877E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	112	1.25400E+03	4.72513E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	114	4.27869E+06	8.05593E-19	1.75932E-25	6.38019E-30	5.05311E-41	3.16944E-63	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	115	1.61497E+04	9.40851E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	116	1.40998E+01	4.01121E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	117	6.95931E+03	5.98846E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	118	2.63955E+02	1.99695E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	119	1.26027E+02	2.19342E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	120	4.40093E+01	4.23761E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	122	1.00998E+01	5.78401E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	113	9.94473E+06	5.24472E-15	7.14409E-18	8.77870E-20	1.46942E-24	4.11676E-34	1.15330E-43	2.53639E-72	0.00000E+00
SN	50	121	9.72156E+04	1.95062E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	123	1.07967E+07	2.76518E-13	6.33994E-16	1.10237E-17	4.39408E-22	6.98462E-31	1.11006E-39	4.45616E-66	0.00000E+00
SN	50	125	8.12599E+05	3.53085E-12	2.99256E-47	1.24399E-70	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
I	53	130	4.44981E+04	2.12372E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
XE	54	133	4.56018E+05	1.02234E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	132	5.58990E+05	8.23341E-16	8.54900E-67	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	134	6.47801E+07	1.45162E-10	5.27123E-11	2.68299E-11	4.95092E-12	1.69403E-13	5.78701E-15	2.30707E-19	3.14193E-25
EU	63	152	4.17559E+08	1.60099E-09	1.37500E-09	1.23823E-09	9.52897E-10	5.64337E-10	3.34218E-10	6.94236E-11	8.54035E-12
EU	63	154	2.69812E+08	1.51533E-10	1.18817E-10	1.01033E-10	6.73625E-11	2.99454E-11	1.33119E-11	1.16943E-12	4.56686E-14
LU	71	174	1.22687E+07	5.13196E-22	2.43983E-24	6.89833E-26	9.27276E-30	1.67547E-37	3.02730E-45	1.78575E-68	0.00000E+00
LU	71	177	1.38242E+07	1.91206E-19	1.65940E-21	7.00704E-23	2.56845E-26	3.45016E-33	4.63452E-40	1.12333E-60	0.00000E+00
HF	72	173	8.49653E+04	3.83635E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	175	6.04840E+06	9.26337E-12	1.79841E-16	1.29908E-19	1.82185E-27	3.58296E-43	7.04647E-59	0.00000E+00	0.00000E+00
HF	72	178	9.78261E+08	1.64253E-20	1.53[illegible]E-20	1.46879E-20	1.31343E-20	1.05026E-20	8.39823E-21	4.29399E-21	1.75560E-21
HF	72	179	1.89304E+10	7.99515E-22	7.96750E-22	7.94911E-22	7.90334E-22	7.81258E-22	7.72286E-22	7.45985E-22	7.12304E-22
HF	72	180	1.98723E+04	1.65648E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	181	3.66357E+06	5.56950E-11	9.26174E-19	6.03410E-24	6.53766E-37	7.67363E-63	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	182	2.84077E+14	7.98880E-27	7.98880E-27	7.98880E-27	7.98880E-27	7.98879E-27	7.98879E-27	7.98877E-27	7.98874E-27
TA	73	180	2.93458E+04	1.80275E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TA	73	182	9.89362E+06	7.80483E-11	1.02751E-13	1.23424E-15	1.95184E-20	4.88102E-30	1.22061E-39	1.90891E-68	0.00000E+00
W	74	181	1.20968E+07	1.33065E-15	5.86307E-18	1.57579E-19	1.86612E-23	2.61703E-31	3.67098E-39	1.01223E-62	0.00000E+00
W	74	185	6.47801E+06	4.19398E-12	1.67197E-16	1.95117E-19	9.07773E-27	1.96476E-41	4.25252E-56	0.00000E+00	0.00000E+00
W	74	187	8.59984E+04	8.22727E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	203	4.02525E+06	5.55334E-18	4.61750E-25	8.79638E-30	1.39337E-41	3.49584E-65	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	205	3.11947E+02	4.08546E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	204	1.19282E+08	5.82891E-20	3.36251E-20	2.33013E-20	9.31479E-21	1.48853E-21	2.37872E-22	9.70736E-25	6.33057E-28
TL	81	206	2.52054E+02	9.84931E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	207	2.86188E+02	8.26621E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	203	1.86782E+05	1.99676E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	205	4.76390E+14	9.12724E-21	9.12723E-21	9.12723E-21	9.12723E-21	9.12723E-21	9.12722E-21	9.12721E-21	9.12719E-21
PB	82	207	7.95989E-01	2.00854E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
			TOTAL (CURIES/CC)	8.40846E-07	3.92747E-08	2.40277E-08	7.73783E-09	1.55533E-09	6.78834E-10	1.44019E-10	4.05213E-11
			TOTAL (CURIES)	8.21428E+00	3.80061E-01	2.325[illegible]E-01	7.48789E-02	1.50509E-02	6.56900E-03	1.39367E-03	3.92124E-04

COMPONENT : CONCRETE - AXIAL DOWN - THIRD 6 INCHES - R5
VOLUME : 9.67700E+06 CC
: ABOVE VOLUME IS FOR THE THIRD 6 INCHES OF CONCRETE
: IN THE AXIAL DOWN DIRECTION.
:
: (INTERVALS 62-64 TOTGDNRS)

NUCLIDE SYM	Z	M	HALF-LIFE (SECONDS)	CONCENTRATION (CURIES/CC) AT TIME SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
H	1	3	3.87233E+08	1.15561E-10	9.75368E-11	8.71189E-11	6.56826E-11	3.73358E-11	2.12227E-11	3.09787E-12	4.06938E-13
HE	2	6	8.09751E-01	1.70450E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
LI	3	8	8.40178E-01	3.05428E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	8	3.00064E-16	4.66104E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	10	7.88563E+13	2.22714E-21	2.22714E-21	2.22713E-21	2.22713E-21	2.22713E-21	2.22712E-21	2.22710E-21	2.22708E-21
B	5	12	1.99756E-02	4.21383E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
C	6	14	1.80978E+11	5.65367E-14	5.65162E-14	5.65026E-14	5.64685E-14	5.64002E-14	5.63321E-14	5.61282E-14	5.58575E-14
F	9	20	1.10023E+01	1.97443E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NE	10	23	3.76710E+01	2.83347E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NA	11	24	5.41521E+04	5.76733E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MG	12	27	5.68153E+02	1.43308E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AL	13	28	1.38629E+02	6.38247E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SI	14	31	9.43057E+03	5.39858E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	1.94260E-12	1.66870E-35	6.99913E-51	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
S	16	35	7.60030E+06	7.44635E-12	1.32488E-15	4.19114E-18	2.35901E-24	7.47315E-37	2.36743E-49	0.00000E+00	0.00000E+00
S	16	37	3.04012E+02	1.31288E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CL	17	36	9.77641E+12	5.30312E-15	5.30308E-15	5.30306E-15	5.30300E-15	5.30288E-15	5.30276E-15	5.30241E-15	5.30193E-15
AR	18	37	3.02684E+06	5.65648E-11	2.17276E-20	1.14812E-26	2.33049E-42	9.60111E-74	0.00000E+00	0.00000E+00	0.00000E+00
AR	18	39	8.48405E+09	9.54544E-13	9.47189E-13	9.42317E-13	9.30248E-13	9.06571E-13	8.83496E-13	8.17735E-13	7.37605E-13
AR	18	41	6.60140E+03	6.81495E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
K	19	40	4.10146E+16	7.38899E-18	7.38899E-18	7.38899E-18	7.38899E-18	7.38899E-18	7.38899E-18	7.38899E-18	7.38899E-18
K	19	42	4.47192E+04	1.98742E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CA	20	41	2.52053E+12	1.58874E-12	1.58870E-12	1.58868E-12	1.58861E-12	1.58847E-12	1.58833E-12	1.58792E-12	1.58737E-12
CA	20	45	1.42623E+07	6.12237E-10	6.14736E-12	2.86111E-13	1.33707E-16	2.91998E-23	6.37689E-30	6.64199E-50	1.51081E-76
CA	20	47	3.91608E+05	3.16630E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	46	7.25049E+06	8.03509E-11	9.42569E-15	2.25871E-17	6.34957E-24	5.01747E-37	3.96478E-50	0.00000E+00	0.00000E+00
SC	21	47	2.96217E+05	1.06777E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	48	1.58253E+05	2.83378E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	49	3.44849E+03	1.18707E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	50	1.03147E+02	4.74276E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	3.48315E+02	8.94308E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	49	2.85246E+07	7.93879E-18	7.95497E-19	1.71617E-19	3.70997E-21	1.73374E-24	8.10218E-28	8.26861E-38	3.94369E-51
V	23	52	2.02805E+02	2.36833E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	53	1.19922E+02	7.04564E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	54	5.50117E+01	8.45871E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39343E+06	3.48038E-11	4.56188E-23	5.46366E-31	8.57751E-51	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	6.42888E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	5.92140E-21	5.92139E-21	5.92139E-21	5.92138E-21	5.92137E-21	5.92136E-21	5.92133E-21	5.92128E-21
MN	25	54	2.61565E+07	7.81999E-12	6.36261E-13	1.19469E-13	1.82518E-15	4.26000E-19	9.94263E-23	1.26414E-33	3.75137E-48
MN	25	56	9.29152E+03	5.37216E-08	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	1.15439E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	1.43508E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	6.89534E-09	3.09833E-09	1.81764E-09	4.79138E-10	3.32937E-11	2.31348E-12	7.76199E-16	1.50962E-20
FE	26	59	3.84409E+06	8.22373E-11	3.94875E-18	5.21642E-23	3.30886E-35	1.33125E-59	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	60	3.15569E+12	1.38825E-26	1.38822E-26	1.38820E-26	1.38815E-26	1.38805E-26	1.38796E-26	1.38767E-26	1.38728E-26
FE	26	61	3.60001E+02	1.72860E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	57	2.34838E+07	5.48588E-17	3.35483E-18	5.20739E-19	4.94305E-21	4.45392E-25	4.01316E-29	2.93581E-41	1.93514E-57
CO	27	58	6.13405E+06	2.27982E-14	5.15001E-19	4.11544E-22	7.42903E-30	2.42075E-45	7.88800E-61	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	1.54835E-10	1.04272E-10	8.01127E-11	4.14518E-11	1.10969E-11	2.97077E-12	5.69992E-14	2.92776E-16
CO	27	61	5.94007E+03	1.97362E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	62	8.34012E+02	8.91855E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	64	2.99999E-01	4.72994E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NI	28	59	2.52053E+12	4.23972E-16	4.23961E-16	4.23954E-16	4.23935E-16	4.23899E-16	4.23862E-16	4.23752E-16	4.23604E-16
NI	28	63	2.90020E+09	6.15045E-14	6.01204E-14	5.92282E-14	5.70362E-14	5.28927E-14	4.90581E-14	3.91177E-14	2.89301E-14
NI	28	65	9.21738E+03	6.89914E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CU	29	64	4.62098E+04	1.08409E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RB	37	86	1.60972E+06	1.00057E-17	1.97585E-35	3.11000E-47	9.66720E-77	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	87	1.00799E+04	5.79581E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	89	4.50096E+06	3.67797E-16	1.71302E-22	1.02929E-26	2.88052E-37	2.25590E-58	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	90	8.86377E+08	8.78161E-21	8.15496E-21	7.76223E-21	6.86118E-21	5.36072E-21	4.18840E-21	1.99766E-21	7.44425E-22
SR	38	91	3.48315E+04	7.75122E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	92	9.75604E+03	3.50751E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	93	4.50095E+02	1.77723E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	89	1.56998E+01	6.78548E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	90	2.30281E+05	1.05673E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	91	5.09667E+06	9.35839E-17	2.39576E-22	4.48343E-26	2.14792E-35	6.92972E-54	1.13143E-72	0.00000E+00	0.00000E+00
Y	39	92	1.27440E+04	2.79887E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	94	1.12200E+03	5.83694E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	96	9.80406E+00	5.21728E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	88	7.20602E+06	1.48912E-19	1.65194E-23	3.81391E-26	9.76838E-33	6.40771E-46	4.20323E-59	0.00000E+00	0.00000E+00
ZR	40	89	2.82249E+05	1.55119E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	93	4.76758E+13	2.23857E-18	2.23857E-18	2.23857E-18	2.23856E-18	2.23855E-18	2.23854E-18	2.23851E-18	2.23847E-18
ZR	40	95	5.63534E+06	1.18519E-15	1.03881E-20	4.41610E-24	1.64547E-32	2.28442E-49	3.17150E-66	0.00000E+00	0.00000E+00
ZR	40	97	6.04840E+04	5.75809E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	91	2.20888E+10	5.34929E-21	5.33342E-21	5.32287E-21	5.29658E-21	5.24438E-21	5.19271E-21	5.04071E-21	4.84494E-21
NB	41	92	8.80746E+05	2.23632E-16	9.80276E-49	2.62555E-70	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	94	6.30134E+11	2.81475E-16	2.81446E-16	2.81426E-16	2.81378E-16	2.81280E-16	2.81182E-16	2.80890E-16	2.80500E-16
NB	41	95	3.02684E+06	2.83010E-17	1.08710E-26	5.74437E-33	1.16601E-48	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	96	8.28132E+04	5.32748E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	97	4.33217E+03	5.05495E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	98	3.06625E+03	1.46605E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	100	3.09996E+00	9.74270E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	93	2.84077E+11	6.02965E-19	6.01926E-19	6.01833E-19	6.01601E-19	6.01138E-19	6.00676E-19	5.99290E-19	5.97447E-19
MO	42	99	2.41515E+05	1.98395E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	101	8.[illegible]6292E+02	1.06910E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	104	2.61565E+02	1.15494E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	106	7.84813E+03	6.54079E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PD	46	107	2.05134E+14	2.45257E-25	2.45257E-25	2.45257E-25	2.45257E-25	2.45257E-25	2.45257E-25	2.45256E-25	2.45255E-25
PD	46	109	4.83704E+04	6.46509E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	106	7.34422E+05	2.46809E-18	3.86549E-57	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	108	4.10329E+09	3.03540E-14	2.98725E-14	2.95557E-14	2.87784E-14	2.72847E-14	2.58685E-14	2.20458E-14	1.78128E-14
AG	47	110	2.15826E+07	4.28755E-12	2.04990E-13	2.70031E-14	1.70067E-16	6.74577E-21	2.67571E-25	1.66982E-38	4.13334E-56
CD	48	109	3.99508E+07	5.34514E-19	1.03419E-19	3.45960E-20	2.23920E-21	9.38045E-24	3.92970E-26	2.88904E-33	8.89779E-43
CD	48	111	2.92221E+03	1.30371E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	115	1.92541E+05	3.82144E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	117	1.22399E+04	1.12156E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	119	5.97541E+02	6.29120E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	111	2.42444E+05	1.78210E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	112	1.25400E+03	1.08005E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	114	4.27869E+06	1.85575E-19	4.05273E-26	1.46973E-30	1.16402E-41	7.30106E-64	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	115	1.61497E+04	2.15175E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	116	1.40998E+01	9.34366E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	117	6.95931E+03	1.37436E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	118	2.63955E+02	4.69608E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	119	1.26827E+02	5.06669E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	120	4.40093E+01	1.00631E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	122	1.00998E+01	1.37443E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	113	9.94473E+06	8.36052E-16	1.13883E-18	1.39940E-20	2.34238E-25	6.56246E-35	1.83658E-44	4.04322E-73	0.00000E+00
SN	50	121	9.72156E+04	1.74468E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	123	1.07967E+07	2.47253E-14	5.66895E-17	9.85697E-19	3.92968E-23	6.24539E-32	9.92573E-41	3.98453E-67	0.00000E+00
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

I	53	130	4.44981E+04	4.86868E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
XE	54	133	4.56018E+05	2.30926E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	132	5.58990E+05	1.95647E-16	2.03147E-67	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	134	6.47801E+07	1.29632E-11	4.70729E-12	2.39595E-12	4.42839E-13	1.51279E-14	5.16788E-16	2.06025E-20	2.80579E-26
EU	63	152	4.17559E+08	1.41068E-10	1.20569E-10	1.08576E-10	8.35568E-11	4.94851E-11	2.93067E-11	6.08755E-12	7.48879E-13
EU	63	154	2.69812E+08	1.33382E-11	1.04586E-11	8.89312E-12	5.92939E-12	2.63585E-12	1.17174E-12	1.02934E-13	4.01985E-15
LU	71	174	1.22687E+07	1.12722E-22	5.35903E-25	1.51520E-26	2.03674E-30	3.68012E-38	6.64938E-46	3.92235E-69	0.00000E+00
LU	71	177	1.38242E+07	4.36688E-20	3.78984E-22	1.60060E-23	5.86601E-27	7.87970E-34	1.05846E-40	2.56555E-61	0.00000E+00
HF	72	173	8.49653E+04	9.11618E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	175	6.04840E+06	8.14835E-13	1.58194E-17	1.14271E-20	1.60255E-28	3.15168E-44	6.19829E-60	0.00000E+00	0.00000E+00
HF	72	178	9.78261E+08	3.79015E-21	3.54425E-21	3.38924E-21	3.03074E-21	2.42348E-21	1.93790E-21	9.90841E-22	4.05106E-22
HF	72	179	1.89304E+10	1.83441E-22	1.82807E-22	1.82385E-22	1.81335E-22	1.79252E-22	1.77194E-22	1.71159E-22	1.63431E-22
HF	72	180	1.98723E+04	3.83302E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	181	3.66357E+06	4.94346E-12	8.22067E-20	5.35583E-25	5.80278E-38	6.81107E-64	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	182	2.84077E+14	1.85778E-27	1.85778E-27	1.85778E-27	1.85778E-27	1.85778E-27	1.85778E-27	1.85777E-27	1.85777E-27
TA	73	180	2.93458E+04	4.27699E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TA	73	182	9.89362E+06	7.07402E-12	9.31295E-15	1.11867E-16	1.76906E-21	4.42398E-31	1.10632E-40	1.73016E-69	0.00000E+00
W	74	181	1.20960E+07	3.16183E-16	1.39315E-18	3.74432E-20	4.43419E-24	6.21845E-32	8.72068E-40	2.40522E-63	0.00000E+00
W	74	185	6.47801E+06	3.76364E-13	1.50041E-17	1.75096E-20	8.14628E-28	1.76316E-42	3.81618E-57	0.00000E+00	0.00000E+00
W	74	187	8.59984E+04	7.34999E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	203	4.02525E+06	1.29523E-18	1.07696E-25	2.05162E-30	3.24982E-42	8.15350E-66	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	205	3.11947E+02	9.63702E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	204	1.19282E+08	1.34790E-20	7.77558E-21	5.38828E-21	2.15399E-21	3.44215E-22	5.50066E-23	2.24477E-25	1.46391E-28
TL	81	206	2.52054E+02	2.30349E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	207	2.86188E+02	1.92096E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	203	1.86782E+05	4.74470E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	205	4.76390E+14	2.16759E-21	2.16759E-21	2.16759E-21	2.16759E-21	2.16759E-21	2.16759E-21	2.16758E-21	2.16758E-21
PB	82	207	7.95989E-01	4.76020E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
			TOTAL (CURIES/CC)	7.47082E-08	3.44557E-09	2.10785E-09	6.78868E-10	1.36500E-10	5.95949E-11	1.26751E-11	3.59[illegible]E-12
			TOTAL (CURIES)	7.22951E-01	3.33428E-02	2.03977E-02	6.56940E-03	1.32091E-03	5.76700E-04	1.22657E-04	3.47764E-05

COMPONENT : CONCRETE - AXIAL DOWN - FOURTH 6 INCHES - R5
VOLUME : 9.67700E+06 CC
: ABOVE VOLUME IS FOR THE FOURTH 6 INCHES OF CONCRETE
: IN THE AXIAL DOWN DIRECTION.
:
: (INTERVALS 65-67 TOTGDNR5)

NUCLIDE SYM	Z	M	HALF-LIFE (SECONDS)	CONCENTRATION (CURIES/CC) AT TIME SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
H	1	3	3.87233E+08	1.24727E-11	1.05204E-11	9.40360E-12	7.08983E-12	4.03005E-12	2.29080E-12	4.20739E-13	4.39252E-14
HE	2	6	8.09751E-01	3.09151E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
LI	3	8	8.40178E-01	3.29770E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	8	3.00064E-16	1.01953E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	10	7.88563E+13	3.61371E-22	3.61371E-22	3.61371E-22	3.61370E-22	3.61369E-22	3.61368E-22	3.61365E-22	3.61361E-22
B	5	12	1.99754E-02	4.54991E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
C	6	14	1.80978E+11	6.11019E-15	6.10797E-15	6.10649E-15	6.10281E-15	6.09544E-15	6.08807E-15	6.06604E-15	6.03678E-15
F	9	20	1.10023E+01	4.64607E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NE	10	23	3.76710E+01	6.46209E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NA	11	24	5.41521E+04	6.23792E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MG	12	27	5.68153E+02	3.23947E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AL	13	28	1.38629E+02	7.07455E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SI	14	31	9.43057E+03	1.10914E-1[illegible]	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	4.28734E-[illegible]3	3.68285E-36	1.54472E-51	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
S	16	35	7.60030E+06	8.0512[illegible]-13	1.43251E-16	4.53162E-19	2.55065E-25	8.08025E-38	2.55975E-50	0.00000E+00	0.00000E+00
S	16	37	3.04012E+02	3.00[illegible]E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CL	17	36	9.77661E+12	5.76[illegible]E-16	5.76861E-16	5.76858E-16	5.76851E-16	5.76839E-16	5.76826E-16	5.76787E-16	5.76735E-16
AR	18	37	3.02604E+06	1.2[illegible]65E-11	4.88464E-21	2.58111E-27	5.23923E-43	2.15845E-74	0.00000E+00	0.00000E+00	0.00000E+00
AR	18	39	8.48405E+09	1.[illegible]682E-13	1.11814E-13	1.11239E-13	1.09814E-13	1.07019E-13	1.04295E-13	9.65322E-14	8.70730E-14
AR	18	41	6.60140E+03	1.[illegible]955E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
K	19	40	4.10346E+16	7.[illegible]7990E-19	7.97990E-19	7.97990E-19	7.97990E-19	7.97990E-19	7.97990E-19	7.97990E-19	7.97989E-19
K	19	42	4.47192E+04	[illegible].15095E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CA	20	41	2.52053E+12	[illegible].71224E-13	1.71220E-13	1.71217E-13	1.71209E-13	1.71194E-13	1.71180E-13	1.71135E-13	1.71076E-13
CA	20	45	1.42623E+07	[illegible].62880E-11	6.65585E-13	3.09777E-14	1.44766E-17	3.16151E-24	6.90438E-31	7.19140E-51	1.63578E-77
CA	20	47	3.91608E+05	3.61251E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	46	7.25049E+06	8.71234E-12	1.02201E-15	2.44909E-18	6.88475E-25	5.44037E-38	4.29895E-51	0.00000E+00	0.00000E+00
SC	21	47	2.96217E+05	2.35859E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	48	1.58253E+05	6.60970E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	49	3.44849E+03	2.66637E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	50	1.03147E+02	1.13187E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	3.48315E+02	9.66989E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	49	2.85246E+07	1.89601E-18	1.89988E-19	4.09873E-20	8.86050E-22	4.14068E-25	1.93504E-28	1.97483E-38	9.41868E-52
V	23	52	2.82084E+02	2.55889E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	53	1.19922E+02	1.61864E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	54	5.50117E+01	2.01938E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39843E+06	3.82233E-12	5.01009E-24	6.00048E-32	9.42027E-52	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	1.45033E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	1.41420E-21	1.41420E-21	1.41420E-21	1.41419E-21	1.41419E-21	1.41419E-21	1.41418E-21	1.41417E-21
MN	25	54	2.61565E+07	1.73211E-12	1.40931E-13	2.64621E-14	4.04274E-16	9.43581E-20	2.20227E-23	2.80005E-34	8.30921E-49
MN	25	56	9.29152E+03	5.82274E-09	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	2.63156E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	3.41334E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	7.43357E-10	3.34017E-10	1.95952E-10	5.16537E-11	3.58925E-12	2.49405E-13	6.36786E-17	1.95087E-21
FE	26	59	3.89409E+06	8.91992E-12	4.28293E-19	5.65788E-24	3.58889E-36	1.44391E-60	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	60	3.15569E+12	3.31344E-27	3.31337E-27	3.31333E-27	3.31321E-27	3.31298E-27	3.31275E-27	3.31206E-27	3.31115E-27
FE	26	61	3.60001E+02	4.12822E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	57	2.34838E+07	1.30976E-17	8.00968E-19	1.24327E-19	1.18016E-21	1.06338E-25	9.58146E-30	7.00926E-42	4.62017E-56
CO	27	58	6.13405E+06	5.03864E-15	1.13820E-19	9.09555E-23	1.64189E-30	5.35010E-46	1.74333E-61	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	1.60431E-11	1.13429E-11	8.71477E-12	4.50910E-12	1.20714E-12	3.23164E-13	6.20846E-15	3.18487E-17
CO	27	61	5.94007E+03	4.45515E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	62	8.34012E+02	2.88091E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00

CO	27	60	[illegible]	1.12950E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NI	28	59	2.52053E+12	4.57915E-17	4.57903E-17	4.57896E-17	4.57876E-17	4.57836E-17	4.57796E-17	4.57677E-17	4.57514E-17
NI	28	63	2.90020E+09	6.74090E-15	6.59741E-15	6.49913E-15	6.25860E-15	5.80392E-15	5.38220E-15	4.29239E-15	3.17451E-15
NI	28	65	9.21738E+03	1.55536E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CU	29	64	4.62090E+04	1.17300E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RB	37	86	1.60972E+06	2.37290E-18	4.60601E-36	7.37579E-48	2.29271E-77	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	87	1.00790E+06	1.36257E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	89	4.50094E+06	8.42106E-17	3.92213E-23	2.35665E-27	6.59521E-38	5.16509E-59	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	90	8.86377E+08	2.06939E-21	1.90315E-21	1.81150E-21	1.60122E-21	1.25105E-21	9.77461E-22	4.66201E-22	1.73729E-22
SR	38	91	3.40315E+04	1.02102E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	92	9.75604E+03	8.35140E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	93	4.50095E+02	4.23950E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	89	1.56990E+01	1.61041E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	90	2.30261E+05	1.14122E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	91	5.09667E+06	2.16104E-17	5.53229E-23	1.03531E-26	4.95998E-36	1.13037E-54	2.61269E-73	0.00000E+00	0.00000E+00
Y	39	92	1.27440E+04	6.56619E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	94	1.12200E+03	1.38131E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	96	9.80406E+00	1.26597E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	88	7.20602E+06	3.40593E-20	3.77834E-24	8.72322E-27	2.23423E-33	1.46550E-46	9.61367E-60	0.00000E+00	0.00000E+00
ZR	40	89	2.82249E+05	3.60775E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	93	4.74758E+13	2.43481E-19	2.43480E-19	2.43480E-19	2.43479E-19	2.43478E-19	2.43477E-19	2.43474E-19	2.43469E-19
ZR	40	95	5.63534E+06	2.82950E-16	2.40003E-21	1.05429E-24	3.92835E-33	5.45378E-50	7.57156E-67	0.00000E+00	0.00000E+00
ZR	40	97	6.04840E+04	9.33592E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	91	2.20880E+10	1.27065E-21	1.26608E-21	1.26437E-21	1.25813E-21	1.24573E-21	1.23346E-21	1.19735E-21	1.15085E-21
NB	41	92	8.80746E+05	5.25158E-17	2.30199E-49	6.16561E-71	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	94	6.30134E+11	3.16043E-17	3.16019E-17	3.15980E-17	3.15933E-17	3.15824E-17	3.15714E-17	3.15386E-17	3.14948E-17
NB	41	95	3.02604E+06	6.51045E-18	2.50306E-27	1.32308E-33	2.68562E-49	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	96	8.20132E+04	1.24393E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	97	4.33217E+03	1.17150E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	98	3.06025E+03	3.46315E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	100	3.09994E+00	2.32544E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	93	2.84077E+11	1.20309E-19	1.20281E-19	1.20262E-19	1.20216E-19	1.20123E-19	1.20031E-19	1.19754E-19	1.19366E-19
MO	42	99	2.41515E+05	2.49962E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	101	8.76292E+02	1.30286E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	104	2.61565E+02	2.71875E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	106	7.84813E+03	1.50992E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PD	46	107	2.05134E+14	5.68063E-26	5.68062E-26	5.68062E-26	5.68062E-26	5.68061E-26	5.68061E-26	5.68059E-26	5.68056E-26
PD	46	109	4.83744E+04	1.49534E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	106	7.34422E+05	5.89452E-19	9.23193E-58	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	108	4.10309E+09	3.32445E-15	3.27172E-15	3.23702E-15	3.15190E-15	2.98030E-15	2.83319E-15	2.41452E-15	1.95091E-15
AG	47	110	2.15826E+07	4.89369E-13	2.33969E-14	3.88206E-15	1.94110E-17	7.69943E-22	3.05398E-26	1.90509E-39	4.71768E-57
CD	48	109	3.99508E+07	1.23510E-19	2.38966E-20	7.99462E-21	5.17446E-22	2.16769E-24	9.08097E-27	6.67614E-34	2.05615E-43
CD	48	113	2.92221E+03	3.03971E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	115	1.92541E+05	9.86074E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	117	1.22399E+04	2.67855E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	119	5.97541E+02	1.50252E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	111	2.42644E+05	4.22714E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	112	1.25400E+03	2.49619E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	114	6.27069E+06	4.31691E-20	9.42761E-27	3.41094E-31	2.70780E-42	1.69840E-64	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	115	1.61497E+04	[illegible]	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	116	1.40990E+01	2.19335E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	117	6.95931E+03	3.18722E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	118	2.63955E+02	1.11166E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	119	1.26027E+02	1.10123E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	120	4.40093E+01	2.40203E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	122	1.00990E+01	3.28255E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	113	9.94473E+06	1.06149E-16	2.26320E-19	2.78103E-21	4.65502E-26	1.30416E-35	3.65303E-45	8.03510E-74	0.00000E+00
SN	50	121	9.72156E+04	1.95315E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	123	1.07967E+07	2.77156E-15	6.36457E-18	1.10491E-19	4.40496E-24	7.80072E-33	1.11262E-41	4.46643E-60	0.00000E+00
SN	50	125	8.12599E+05	3.51666E-14	2.98052E-49	1.23898E-72	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
I	53	130	4.64901E+06	1.12636E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
XE	54	133	4.56010E+05	5.20500E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	132	5.58990E+05	4.67264E-17	4.05176E-68	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	134	6.47801E+07	1.46775E-12	8.32901E-13	2.71281E-13	8.01403E-14	1.71205E-15	5.05132E-17	2.33271E-21	3.17605E-27
EU	63	152	4.17559E+08	1.52129E-11	1.30809E-11	1.17075E-11	9.00950E-12	5.35577E-12	3.16002E-12	6.56396E-13	8.07605E-14
EU	63	154	2.69812E+08	1.46520E-12	1.16109E-12	9.70209E-13	6.46930E-13	2.87564E-13	1.27044E-13	1.12309E-14	4.30508E-16
LU	71	176	1.22607E+07	2.51604E-23	1.19751E-25	3.30526E-27	4.55009E-31	8.22212E-39	1.40561E-46	8.76333E-70	0.00000E+00
LU	71	177	1.30242E+07	1.00802E-20	8.75517E-23	5.69761E-24	1.35514E-27	1.82034E-34	2.44822E-41	5.92683E-62	0.00000E+00
HF	72	173	8.49653E+04	2.17721E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	175	6.04840E+06	8.90640E-14	1.72072E-18	1.24076E-21	1.75125E-29	3.44611E-45	6.77340E-61	0.00000E+00	0.00000E+00
HF	72	178	9.70261E+08	8.83018E-22	8.25720E-22	7.89615E-22	7.06091E-22	5.64616E-22	4.51405E-22	2.30843E-22	9.43003E-23
HF	72	179	1.89304E+10	4.25346E-23	4.23094E-23	4.22917E-23	4.20402E-23	4.15653E-23	4.10800E-23	3.96807E-23	3.78967E-23
HF	72	180	1.98723E+04	8.94946E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	181	3.66357E+06	5.60094E-13	9.52735E-21	6.07685E-26	6.60397E-39	7.72799E-65	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	182	2.84077E+14	4.35539E-28	4.35539E-28	4.35538E-28	4.35538E-28	4.35538E-28	4.35538E-28	4.35537E-28	4.35535E-28
TA	73	180	2.93450E+04	1.02007E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TA	73	182	9.09362E+06	8.30958E-13	1.09594E-15	1.31405E-17	2.07004E-22	5.19666E-32	1.29956E-41	2.03235E-70	0.00000E+00
W	74	181	1.20966E+07	7.55107E-17	3.32712E-19	8.94216E-21	1.05097E-24	1.60509E-32	2.00267E-40	5.74413E-64	0.00000E+00
W	74	185	6.47801E+06	4.26208E-14	1.69942E-18	1.98321E-21	9.22680E-29	1.99702E-43	4.32235E-58	0.00000E+00	0.00000E+00
W	74	187	8.59904E+04	8.34326E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	203	4.02525E+06	3.06560E-19	2.53069E-26	4.62099E-31	7.63668E-43	1.91595E-66	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	205	3.11967E+02	2.20693E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	204	1.19202E+08	3.16605E-21	1.01684E-21	1.25764E-21	5.02746E-22	8.03484E-23	1.20386E-23	5.23933E-26	3.41679E-29
TL	81	206	2.52056E+02	5.42993E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	207	2.86188E+02	4.50017E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	203	1.86782E+05	1.13315E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	205	4.76390E+14	5.17420E-22	5.17420E-22	5.17420E-22	5.17419E-22	5.17419E-22	5.17419E-22	5.17418E-22	5.17417E-22
PB	82	207	7.95900E-01	1.13427E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
			TOTAL (CURIES/CC)	8.11851E-09	3.71693E-10	2.27379E-10	7.32560E-11	1.47453E-11	6.64171E-12	1.37574E-12	3.95119E-13
			TOTAL (CURIES)	7.88620E-02	3.59600E-03	2.20034E-03	7.08906E-04	1.42690E-04	6.23366E-05	1.33131E-05	3.82340E-06

COMPONENT : CONCRETE - AXIAL DOWN - FIFTH 6 INCHES - RS
VOLUME : 9.67700E+06 CC
: ABOVE VOLUME IS FOR THE FIFTH 6 INCHES OF CONCRETE
: IN THE AXIAL DOWN DIRECTION.
:
: (INTERVALS 68-70 TOTGDNRS)

NUCLIDE			HALF-LIFE	CONCENTRATION (CURIES/CC) AT TIME							
SYM	Z	M	(SECONDS)	SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
H	1	3	3.87233E+08	1.61917E-12	1.36677E-12	1.22076E-12	9.20380E-13	5.23170E-13	2.97364E-13	5.46190E-14	5.70223E-15
HE	2	6	8.09751E-01	8.60268E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
LI	3	8	8.60178E-01	4.28273E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	8	3.00064E-16	2.25608E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	10	7.88563E+13	6.90974E-23	6.90973E-23	6.90973E-23	6.90972E-23	6.90970E-23	6.90968E-23	6.90962E-23	6.90955E-23
B	5	12	1.99754E-02	5.90937E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
C	6	14	1.80978E+11	7.94602E-16	7.94314E-16	7.94122E-16	7.93642E-16	7.92684E-16	7.91726E-16	7.88860E-16	7.85056E-16
F	9	20	1.10023E+01	1.09849E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NE	10	23	3.76710E+01	1.48654E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NA	11	24	5.61521E+04	8.12251E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MG	12	27	5.68153E+02	7.39419E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AL	13	28	1.38629E+02	9.53747E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SI	14	31	9.43057E+03	2.64335E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	9.55558E-14	8.20831E-37	3.44285E-52	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
S	16	35	7.60030E+06	1.04748E-13	1.86371E-17	5.89567E-20	3.31842E-26	1.05125E-38	3.33026E-51	0.00000E+00	0.00000E+00
S	16	37	3.06012E+02	6.93184E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CL	17	36	9.77641E+12	7.57418E-17	7.57413E-17	7.57410E-17	7.57401E-17	7.57384E-17	7.57367E-17	7.57316E-17	7.57249E-17
AR	18	37	3.02684E+06	2.88660E-12	1.10880E-21	5.85905E-28	1.18929E-43	4.89962E-75	0.00000E+00	0.00000E+00	0.00000E+00
AR	18	39	8.48405E+09	1.63839E-14	1.62577E-14	1.61741E-14	1.59669E-14	1.55605E-14	1.51644E-14	1.40357E-14	1.26603E-14
AR	18	41	6.60140E+03	3.51305E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
K	19	40	4.10146E+16	1.03672E-19	1.03672E-19	1.03672E-19	1.03672E-19	1.03672E-19	1.03672E-19	1.03672E-19	1.03672E-19
K	19	42	4.47192E+04	2.80327E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CA	20	41	2.52053E+12	2.21718E-14	2.21713E-14	2.21709E-14	2.21699E-14	2.21680E-14	2.21661E-14	2.21603E-14	2.21526E-14
CA	20	45	1.42623E+07	8.64345E-12	8.67872E-14	4.03926E-15	1.88764E-18	4.12237E-25	9.00277E-32	9.37703E-52	2.13294E-78
CA	20	47	3.91808E+05	4.41905E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	46	7.25049E+06	1.13090E-12	1.33600E-16	3.20152E-19	8.99992E-26	7.11179E-39	5.61970E-52	0.00000E+00	0.00000E+00
SC	21	47	2.96217E+05	5.26678E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	48	1.58253E+05	1.55598E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	49	3.44849E+03	6.05584E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	50	1.03147E+02	2.70967E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	3.48315E+02	1.25854E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	49	2.85246E+07	4.54202E-19	4.55128E-20	9.81876E-21	2.12259E-22	9.91926E-26	4.63551E-29	4.73084E-39	2.25631E-52
V	23	52	2.02084E+02	3.32673E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	53	1.19922E+02	3.74778E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	54	5.50117E+01	4.83566E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39843E+06	5.09017E-13	6.67190E-25	7.99080E-33	1.25449E-52	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	3.30485E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	3.38779E-22	3.38779E-22	3.38779E-22	3.38779E-22	3.38778E-22	3.38778E-22	3.38775E-22	3.38773E-22
MN	25	54	2.61565E+07	3.87626E-13	3.15386E-14	5.92191E-15	9.04717E-17	2.11162E-20	4.92842E-24	6.26619E-35	1.85950E-49
MN	25	56	9.29152E+03	7.60567E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	6.05319E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	8.14710E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	9.63002E-11	4.32711E-11	2.53851E-11	6.69161E-12	4.64979E-13	3.23099E-14	1.08404E-17	2.52730E-22
FE	26	59	3.89409E+06	1.16632E-12	5.60910E-20	7.39752E-25	4.69263E-37	1.88797E-61	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	60	3.15569E+12	7.93313E-28	7.93297E-28	7.93286E-28	7.93258E-28	7.93203E-28	7.93148E-28	7.92983E-28	7.92763E-28
FE	26	61	3.60001E+02	9.88903E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	57	2.34830E+07	3.13669E-18	1.91821E-19	2.97746E-20	2.82632E-22	2.54664E-26	2.29463E-30	1.67862E-47	1.10647E-58
CO	27	58	6.13405E+06	1.12552E-15	2.54250E-20	2.03174E-23	3.66762E-31	1.19509E-46	3.89421E-62	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	2.21204E-12	1.40960E-12	1.14453E-12	5.92190E-13	1.58534E-13	4.24418E-14	8.14318E-16	4.18275E-18
CO	27	61	5.94007E+03	1.01586E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	62	8.34012E+02	4.88317E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	64	2.99999E-01	2.70567E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NI	28	59	2.52053E+12	5.95009E-18	5.94993E-18	5.94983E-18	5.94957E-18	5.94906E-18	5.94854E-18	5.94699E-18	5.94493E-18
NI	28	63	2.90020E+09	8.95968E-16	8.75922E-16	8.62809E-16	8.30877E-16	7.70515E-16	7.14538E-16	5.69867E-16	4.21440E-16
NI	28	65	9.21738E+03	3.54840E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CU	29	64	4.62098E+04	1.52819E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RB	37	86	1.60972E+06	5.64926E-19	1.11567E-36	1.75597E-48	5.45615E-78	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	87	1.00799E+04	3.21845E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	89	4.50096E+06	1.94492E-17	9.05849E-24	5.44288E-28	1.52322E-38	1.19292E-59	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	90	8.86377E+08	4.81078E-22	4.46748E-22	4.25234E-22	3.75872E-22	2.93673E-22	2.29451E-22	1.09437E-22	4.07814E-23
SR	38	91	3.48315E+04	4.30228E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	92	9.75604E+03	1.99520E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	93	4.50295E+02	1.01457E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	89	1.56998E+01	3.86370E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	90	2.30281E+05	1.48262E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	91	5.09667E+06	5.02820E-18	1.20722E-23	2.40891E-27	1.15406E-36	2.64870E-55	6.07907E-74	0.00000E+00	0.00000E+00
Y	39	92	1.27440E+04	1.53942E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	94	1.12200E+03	3.28206E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	96	9.80406E+00	2.90466E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	88	7.20602E+06	7.85432E-21	8.71312E-25	2.01164E-27	5.15231E-34	3.37973E-47	2.21698E-60	0.00000E+00	0.00000E+00
ZR	40	89	2.82249E+05	8.44547E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	93	4.74758E+13	3.19693E-20	3.19693E-20	3.19692E-20	3.19692E-20	3.19690E-20	3.19689E-20	3.19684E-20	3.19678E-20
ZR	40	95	5.63534E+06	6.77598E-17	5.93908E-22	2.52477E-25	9.40747E-34	1.30605E-50	1.81321E-67	0.00000E+00	0.00000E+00
ZR	40	97	6.04840E+04	1.82413E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	91	2.20888E+10	3.02923E-22	3.02024E-22	3.01427E-22	2.99938E-22	2.96982E-22	2.94056E-22	2.85448E-22	2.74362E-22
NB	41	92	8.80746E+05	1.24005E-17	5.43568E-50	1.45508E-71	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	94	6.30134E+11	4.33992E-18	4.33947E-18	4.33916E-18	4.33841E-18	4.33691E-18	4.33540E-18	4.33089E-18	4.32488E-18
NB	41	95	3.02684E+06	1.51525E-18	5.81266E-28	3.07150E-34	6.23463E-50	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	96	8.28132E+04	2.92145E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	97	4.33217E+03	2.73362E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	98	7.06025E+03	8.21526E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	100	3.09994E+00	5.56775E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	93	2.84077E+11	2.61877E-20	2.61817E-20	2.61777E-20	2.61676E-20	2.61474E-20	2.61273E-20	2.60670E-20	2.59869E-20
MO	42	99	2.41515E+05	3.93482E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	101	8.76292E+02	1.97869E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	104	2.61565E+02	6.43006E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	106	7.84813E+03	3.50947E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PD	46	107	2.05134E+14	1.32535E-26	1.32535E-26	1.32534E-26	1.32534E-26	1.32534E-26	1.32534E-26	1.32534E-26	1.32533E-26
PD	46	109	4.83704E+04	3.48474E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	106	7.34822E+05	1.41207E-19	2.21157E-58	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	108	4.16389E+09	4.41019E-16	4.34823E-16	4.29421E-16	4.18127E-16	3.96424E-16	3.75848E-16	3.20308E-16	2.58806E-16
AG	47	110	2.15826E+07	6.88147E-14	3.29006E-15	4.33397E-16	2.72956E-18	1.08269E-22	4.29449E-27	2.68004E-40	6.63397E-58
CD	48	109	3.99508E+07	2.87583E-20	5.56420E-21	1.86136E-21	1.20475E-22	5.04694E-25	2.11429E-27	1.55438E-34	4.78726E-44
CD	48	111	2.92221E+03	7.15060E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	115	1.92541E+05	2.15462E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	117	1.22399E+04	6.41648E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	119	5.97541E+02	3.59938E-24	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	111	2.42444E+05	1.00648E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	112	1.25400E+03	5.81258E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	114	4.27869E+06	1.01077E-20	2.20740E-27	8.00518E-32	6.34010E-43	3.97667E-65	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	115	1.61497E+04	1.15913E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	116	1.60998E+01	5.17442E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	117	6.95931E+03	7.44312E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	118	2.63955E+02	2.64110E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	119	1.26027E+02	2.77074E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	120	4.40093E+01	5.75133E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	122	1.00998E+01	7.86355E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	113	9.94473E+06	3.61133E-17	4.91916E-20	6.04469E-22	1.01179E-26	2.83465E-36	7.94176E-46	1.74647E-74	0.00000E+00
SN	50	121	9.72156E+04	2.66997E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	123	1.07967E+07	3.79069E-16	8.70955E-19	1.51439E-20	6.03740E-25	9.59518E-34	1.52495E-42	6.12168E-69	0.00000E+00

I	53	130	4.46981E+04	2.62147E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
XE	54	133	4.56018E+05	1.22067E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	132	5.58990E+05	1.11936E-17	1.16226E-48	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	134	6.47801E+07	2.04127E-13	7.41244E-14	3.77284E-14	6.97326E-15	2.38215E-16	8.13772E-18	3.24422E-22	4.41820E-28
EU	63	152	4.17559E+08	1.97159E-12	1.68486E-12	1.51727E-12	1.16766E-12	6.91514E-13	4.09537E-13	8.50687E-14	1.04650E-14
EU	63	154	2.69812E+08	1.92035E-13	1.50575E-13	1.28037E-13	8.53673E-14	3.79492E-14	1.68699E-14	1.48200E-15	5.78750E-17
LU	71	174	1.22687E+07	5.69623E-24	2.70809E-26	7.65682E-28	1.02923E-31	1.85969E-39	3.36015E-47	1.98210E-70	0.00000E+00
LU	71	177	1.56242E+07	2.34872E-21	2.03836E-23	8.60823E-25	3.15502E-28	4.23808E-35	5.69291E-42	1.37987E-62	0.00000E+00
HF	72	175	8.49653E+04	5.21566E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	175	6.04840E+06	1.17828E-16	2.28753E-19	1.65240E-22	2.31734E-30	4.55742E-46	8.96291E-62	0.00000E+00	0.00000E+00
HF	72	178	9.78261E+08	2.07038E-22	1.95605E-22	1.85138E-22	1.65554E-22	1.32383E-22	1.05858E-22	5.41248E-23	2.21289E-23
HF	72	179	1.89384E+10	9.93395E-24	9.89959E-24	9.87674E-24	9.81967E-24	9.70710E-24	9.59563E-24	9.26883E-24	8.85035E-24
HF	72	180	1.98723E+04	2.10195E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	181	3.66357E+06	7.84029E-14	1.30579E-21	8.49432E-27	9.20318E-40	1.08923E-65	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	182	2.84077E+14	1.02646E-28	1.02646E-28	1.02646E-28	1.02646E-28	1.02646E-28	1.02646E-28	1.02645E-28	1.02645E-28
TA	73	180	2.93458E+04	2.44068E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TA	73	182	9.89362E+06	1.21234E-13	1.59604E-16	1.91716E-18	3.03182E-23	7.58177E-33	1.89600E-42	2.96513E-71	0.00000E+00
W	74	181	1.20968E+07	1.80884E-17	7.97002E-20	2.14207E-21	2.53673E-25	3.55748E-33	4.98897E-41	1.37599E-64	0.00000E+00
W	74	185	6.47801E+06	5.92489E-15	2.36201E-19	2.75645E-22	1.28242E-29	2.77564E-44	6.00760E-59	0.00000E+00	0.00000E+00
W	74	187	8.59984E+04	1.16449E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	203	4.02525E+06	7.16640E-20	5.97535E-27	1.13831E-31	1.80311E-43	4.52385E-67	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	205	3.11947E+02	5.44734E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	204	1.19282E+08	7.38810E-22	4.26195E-22	2.95342E-22	1.18064E-22	1.88671E-23	3.01502E-24	1.25040E-26	8.02396E-30
TL	81	206	2.52054E+02	1.28394E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	207	2.86188E+02	1.05977E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	203	1.86782E+05	2.71446E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	205	4.76390E+14	1.23895E-22	1.23895E-22	1.23895E-22	1.23895E-22	1.23895E-22	1.23895E-22	1.23895E-22	1.23894E-22
PB	82	207	7.95989E-01	2.71168E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
			TOTAL (CURIES/CC)	1.06437E-09	4.81996E-11	2.96843E-11	9.50452E-12	1.91616E-12	8.37850E-13	1.79956E-13	5.25937E-14
			TOTAL (CURIES)	1.02999E-02	4.66428E-04	2.85319E-04	9.19752E-05	1.85426E-05	8.10787E-06	1.74143E-06	5.08949E-07

COMPONENT : CONCRETE - AXIAL DOWN - SIXTH 6 INCHES - R5
VOLUME : 9.67700E+06 CC
: ABOVE VOLUME IS FOR THE SIXTH 6 INCHES OF CONCRETE
: IN THE AXIAL DOWN DIRECTION.
:
: (INTERVALS 71-73 TOTGDNRS)

NUCLIDE SYM	Z	M	HALF-LIFE (SECONDS)	CONCENTRATION (CURIES/CC) AT TIME SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
H	1	3	3.87233E+08	2.66524E-13	2.24977E-13	2.00944E-13	1.51500E-13	8.61167E-14	4.89511E-14	8.99660E-15	9.50620E-16
HE	2	6	8.09751E-01	1.92384E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
LI	3	8	8.40178E-01	7.05242E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	8	3.00064E-16	5.03940E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	10	7.88563E+13	1.45764E-23	1.45764E-23	1.45764E-23	1.45764E-23	1.45763E-23	1.45763E-23	1.45762E-23	1.45760E-23
B	5	12	1.99754E-02	9.73076E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
C	6	14	1.80978E+11	1.30990E-16	1.30942E-16	1.30910E-16	1.30831E-16	1.30673E-16	1.30515E-16	1.30043E-16	1.29416E-16
F	9	20	1.10023E+01	2.60659E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NE	10	23	3.76710E+01	3.44303E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NA	11	24	5.41521E+04	1.34059E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MG	12	27	5.68153E+02	1.70101E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AL	13	28	1.38629E+02	1.62424E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SI	14	31	9.43057E+03	5.92586E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	2.14855E-14	1.84562E-37	7.74117E-53	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
S	16	35	7.60030E+06	1.72780E-14	3.07416E-18	9.72482E-21	5.47368E-27	1.73402E-39	5.49321E-52	0.00000E+00	0.00000E+00
S	16	37	3.04012E+02	1.60962E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CL	17	36	9.77641E+12	1.25062E-17	1.25061E-17	1.25060E-17	1.25059E-17	1.25056E-17	1.25053E-17	1.25045E-17	1.25034E-17
AR	18	37	3.02684E+06	6.60539E-13	2.53725E-22	1.34072E-28	2.72144E-44	1.12118E-75	0.00000E+00	0.00000E+00	0.00000E+00
AR	18	39	8.48405E+09	2.94906E-15	2.92633E-15	2.91128E-15	2.87399E-15	2.80084E-15	2.72955E-15	2.52639E-15	2.27882E-15
AR	18	41	6.60140E+03	8.00079E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
K	19	40	4.10146E+16	1.70752E-20	1.70752E-20	1.70752E-20	1.70752E-20	1.70752E-20	1.70752E-20	1.70752E-20	1.70752E-20
K	19	42	4.47192E+04	4.62049E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CA	20	41	2.52055E+12	3.64247E-15	3.64238E-15	3.64232E-15	3.64216E-15	3.64184E-15	3.64153E-15	3.64058E-15	3.63931E-15
CA	20	45	1.42623E+07	1.42773E-12	1.43355E-14	6.67206E-16	3.11801E-19	6.80934E-26	1.48708E-32	1.54890E-52	0.00000E+00
CA	20	47	3.91608E+05	7.26086E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	46	7.25049E+06	1.80535E-13	2.21164E-17	5.29983E-20	1.48986E-26	1.17730E-39	9.30293E-53	0.00000E+00	0.00000E+00
SC	21	47	2.96217E+05	1.18599E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	48	1.58253E+05	3.65627E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	49	3.44049E+03	1.38644E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	50	1.03167E+02	6.50169E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	3.48315E+02	2.87616E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	49	2.85246E+07	1.09048E-19	1.09270E-20	2.35735E-21	5.09604E-23	2.38148E-26	1.11292E-29	1.13581E-39	5.41708E-53
V	23	52	2.02084E+02	5.48326E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	53	1.19922E+02	8.73086E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	54	5.50117E+01	1.16066E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39843E+06	8.55928E-14	1.12190E-25	1.34368E-33	2.10946E-53	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	[illegible].59107E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	8.13363E-23	8.13362E-23	8.13362E-23	8.13361E-23	8.13360E-23	8.13358E-23	8.13354E-23	8.13348E-23
MN	25	54	2.61565E+07	8.75251E-14	7.12134E-15	1.33716E-15	2.04283E-17	4.76800E-21	1.11283E-24	1.41489E-35	4.19872E-50
MN	25	56	9.29152E+03	1.25799E-10	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	1.40229E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	1.94961E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	1.58261E-11	7.11124E-12	4.17182E-12	1.09971E-12	7.64153E-14	5.30986E-15	1.78152E-18	4.15341E-23
FE	26	59	3.89409E+06	1.93050E-13	9.26934E-21	1.22451E-25	7.76728E-38	3.12499E-62	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	60	3.15569E+12	1.90368E-28	1.90364E-28	1.90362E-28	1.90355E-28	1.90342E-28	1.90329E-28	1.90289E-28	1.90236E-28
FE	26	61	3.60061E+02	2.37413E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	57	2.34838E+07	7.52881E-19	4.60416E-20	7.14661E-21	6.78384E-23	6.11255E-27	5.50766E-31	4.02910E-43	2.65578E-59
CO	27	58	6.13405E+06	2.53637E-16	5.72953E-21	4.57855E-24	8.26500E-32	2.69315E-47	8.77562E-63	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	3.67368E-13	2.47401E-13	1.90079E-13	9.83487E-14	2.63291E-14	7.04858E-15	1.35239E-16	6.94656E-19
CO	27	61	5.94007E+03	2.33527E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	62	8.34012E+02	1.15098E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00

CO	27	60	2.00009E-01	6.49612E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NI	28	59	2.52053E+12	9.80135E-19	9.80110E-19	9.80092E-19	9.80050E-19	9.79965E-19	9.79880E-19	9.79625E-19	9.79285E-19
NI	28	63	2.90020E+09	1.50355E-16	1.46791E-16	1.46790E-16	1.39432E-16	1.29302E-16	1.19908E-16	9.56275E-17	7.07230E-17
NI	28	65	9.21738E+03	8.16303E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CU	29	64	4.62098E+04	2.52241E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RB	37	86	1.60972E+06	1.34871E-19	2.46334E-37	4.19210E-49	1.30308E-78	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	87	1.80799E+04	7.62954E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	89	4.50096E+06	4.52274E-18	2.10648E-24	1.26578E-28	3.54213E-39	2.77404E-60	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	90	8.86377E+08	1.13437E-22	1.05542E-22	1.00269E-22	8.86299E-23	6.92476E-23	5.41040E-23	2.58050E-23	9.61616E-24
SR	38	91	3.48315E+04	1.01967E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	92	9.75604E+03	4.77855E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	93	4.50098E+02	2.43357E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	89	1.56998E+01	9.25857E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	90	2.30281E+05	2.44192E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	91	5.09667E+06	1.17683E-18	3.01270E-24	5.63797E-28	2.70104E-37	6.19919E-56	1.42278E-74	0.00000E+00	0.00000E+00
Y	39	92	1.27440E+04	3.63528E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	94	1.12200E+03	7.82199E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	96	9.00406E+00	7.16541E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	88	7.20662E+06	1.82301E-21	2.02234E-25	4.66907E-28	1.19587E-34	7.84445E-48	5.14568E-61	0.00000E+00	0.00000E+00
ZR	40	89	2.82249E+05	1.98692E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	93	4.74758E+13	5.31502E-21	5.31501E-21	5.31501E-21	5.31500E-21	5.31497E-21	5.31495E-21	5.31487E-21	5.31478E-21
ZR	40	95	5.63534E+06	1.62633E-17	1.42547E-22	6.05982E-26	2.25793E-34	3.13471E-51	4.35196E-68	0.00000E+00	0.00000E+00
ZR	40	97	6.04840E+04	3.78269E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	91	2.20888E+10	7.24123E-23	7.21975E-23	7.20547E-23	7.16988E-23	7.09923E-23	7.02927E-23	6.82351E-23	6.55851E-23
NB	41	92	8.80746E+05	2.94050E-18	1.28895E-50	3.45228E-72	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	94	6.30134E+11	7.44548E-19	7.44470E-19	7.44419E-19	7.44289E-19	7.44031E-19	7.43773E-19	7.42999E-19	7.41968E-19
NB	41	95	3.02684E+06	3.53472E-19	1.35775E-28	7.17457E-35	1.45632E-50	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	96	8.28132E+04	6.89196E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	97	4.33217E+03	6.41425E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	98	3.06025E+03	1.95503E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	100	3.09994E+00	1.33610E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	93	2.84077E+11	5.65801E-21	5.65670E-21	5.65583E-21	5.65365E-21	5.64930E-21	5.64495E-21	5.63193E-21	5.61460E-21
MO	42	99	2.41515E+05	7.35856E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	101	8.76292E+02	3.62285E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	104	2.61565E+02	1.52618E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	106	7.84813E+03	8.20057E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PD	46	107	2.05134E+14	3.10960E-27	3.10960E-27	3.10960E-27	3.10960E-27	3.10959E-27	3.10959E-27	3.10958E-27	3.10957E-27
PD	46	109	4.83704E+04	8.16817E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	106	7.34422E+05	3.39019E-20	5.30968E-59	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	108	4.18389E+09	7.37995E-17	7.26288E-17	7.18587E-17	6.99689E-17	6.63371E-17	6.28939E-17	5.35999E-17	4.33083E-17
AG	47	110	2.15826E+07	1.20032E-14	5.73878E-16	7.55964E-17	4.76111E-19	1.88851E-23	7.49078E-28	4.67474E-41	1.15715E-58
CD	48	109	3.99508E+07	6.73476E-21	1.30305E-21	4.35901E-22	2.82134E-23	1.18192E-25	4.95134E-28	3.64012E-35	1.12110E-44
CD	48	111	2.92221E+03	1.68055E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	115	1.92541E+05	5.14797E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	117	1.22399E+04	1.54048E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	119	5.97541E+02	8.64163E-25	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	111	2.42444E+05	2.40319E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	112	1.25400E+03	1.36142E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	114	4.27869E+06	2.37853E-21	5.19443E-28	1.88377E-32	1.49194E-43	9.35785E-66	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	115	1.61497E+04	2.71614E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	116	1.40998E+01	1.22536E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	117	6.95931E+03	1.74760E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	118	2.63955E+02	6.29501E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	119	1.26027E+02	6.52939E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	120	4.40093E+01	1.38020E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	122	1.00998E+01	1.88793E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	113	9.94473E+06	7.79296E-18	1.06152E-20	1.30449E-22	2.18336E-27	6.11696E-37	1.71377E-46	3.76873E-75	0.00000E+00
SN	50	121	9.72156E+04	4.56632E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	123	1.07967E+07	6.52696E-17	1.49649E-19	2.60204E-21	1.03735E-25	1.34865E-34	2.62019E-43	1.05183E-69	0.00000E+00
SN	50	125	8.12599E+05	8.20407E-16	6.95332E-51	2.89045E-74	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
I	53	130	4.44981E+04	6.12970E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
XE	54	133	4.56018E+05	2.83961E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	132	5.58999E+05	2.68743E-18	2.79044E-69	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	134	6.47801E+07	3.53367E-14	1.28318E-14	6.53120E-15	1.20715E-15	4.12377E-17	1.40873E-18	5.61611E-23	7.64040E-29
EU	63	152	4.17559E+08	3.24111E-13	2.76975E-13	2.49425E-13	1.91949E-13	1.13678E-13	6.73241E-14	1.39845E-14	1.72034E-15
EU	63	154	2.69812E+08	3.20082E-14	2.50977E-14	2.13411E-14	1.42209E-14	6.32534E-15	2.81187E-15	2.47018E-16	9.64656E-18
LU	71	174	1.22687E+07	1.30120E-24	6.18613E-27	1.74906E-28	2.35109E-32	4.24010E-40	7.67564E-48	4.52772E-71	0.00000E+00
LU	71	177	1.38242E+07	5.50127E-22	4.77434E-24	2.01626E-25	7.38983E-29	9.92663E-36	1.33342E-42	3.23200E-63	0.00000E+00
HF	72	173	8.49653E+04	1.25221E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	175	6.04840E+06	1.96879E-15	3.82128E-20	2.76031E-23	3.87108E-31	7.61311E-47	1.49724E-62	0.00000E+00	0.00000E+00
HF	72	178	9.78261E+08	4.87813E-23	4.56164E-23	4.36214E-23	3.90072E-23	3.11915E-23	2.49417E-23	1.27527E-23	5.21393E-24
HF	72	179	1.89384E+10	2.33276E-24	2.32469E-24	2.31933E-24	2.30597E-24	2.27949E-24	2.25331E-24	2.17657E-24	2.07830E-24
HF	72	180	1.98723E+04	4.95926E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	181	3.66357E+06	1.36221E-14	2.26527E-22	1.47584E-27	1.59980E-40	1.87684E-66	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	182	2.84077E+14	2.42885E-29	2.42885E-29	2.42884E-29	2.42884E-29	2.42884E-29	2.42884E-29	2.42883E-29	2.42883E-29
TA	73	180	2.93458E+04	5.85334E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TA	73	182	9.89362E+06	2.16631E-14	2.85195E-17	3.42574E-19	5.41752E-24	1.35478E-33	3.38793E-43	5.29836E-72	0.00000E+00
W	74	181	1.20960E+07	4.34264E-18	1.91344E-20	5.14266E-22	6.09015E-26	8.54076E-34	1.19775E-41	3.30346E-65	0.00000E+00
W	74	185	6.47801E+06	1.02572E-15	4.00912E-20	4.77196E-23	2.22014E-30	6.00519E-45	1.04004E-59	0.00000E+00	0.00000E+00
W	74	187	8.59406E+04	2.02089E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	203	4.02525E+06	1.70305E-20	1.41605E-27	2.69759E-32	4.27305E-44	1.87207E-67	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	205	3.11947E+02	1.30114E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	204	1.19282E+08	1.74319E-22	1.00559E-22	6.96048E-23	2.78568E-23	4.45161E-24	7.11381E-25	2.90308E-27	1.09322E-30
TL	81	206	2.52054E+02	3.04876E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	207	2.86188E+02	2.50571E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	203	1.86782E+05	6.51695E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	205	4.76390E+14	2.97335E-23	2.97335E-23	2.97335E-23	2.97335E-23	2.97334E-23	2.97334E-23	2.97334E-23	2.97333E-23
PB	82	207	7.95909E-01	6.49047E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TOTAL (CURIES/CC)				1.76679E-10	7.92753E-12	4.04913E-12	1.56383E-12	3.15609E-13	1.38145E-13	2.98197E-14	8.04521E-15
TOTAL (CURIES)				1.70973E-03	7.67147E-05	4.69251E-05	1.51332E-05	3.05492E-06	1.33683E-06	1.88565E-07	8.55950E-08

COMPONENT : CONCRETE - AXIAL DOWN - SEVENTH 6 INCHES - R5
VOLUME : 9.67700E-06 CC
: ABOVE VOLUME IS FOR THE SEVENTH 6 INCHES OF CONCRETE
: IN THE AXIAL DOWN DIRECTION.
:
: (INTERVALS 74-76 TOTGDNRS)

NUCLIDE SYM	Z	N	HALF-LIFE (SECONDS)	CONCENTRATION (CURIES/CC) AT TIME SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
H	1	3	3.87233E+08	4.94498E-14	4.17414E-14	3.72823E-14	2.81087E-14	1.59777E-14	9.08220E-15	1.66808E-15	1.74146E-16
HE	2	6	8.09751E-01	4.34445E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
LI	3	8	8.40178E-01	1.30896E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	8	3.00064E-16	1.13555E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	10	7.88563E+13	3.20025E-24	3.20025E-24	3.20025E-24	3.20024E-24	3.20023E-24	3.20022E-24	3.20020E-24	3.20016E-24
B	5	12	1.99754E-02	1.80599E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
C	6	16	1.80978E+11	2.43332E-17	2.43244E-17	2.43185E-17	2.43038E-17	2.42744E-17	2.42451E-17	2.41574E-17	2.40409E-17
F	9	20	1.10023E+01	6.20341E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NE	10	23	3.76710E+01	8.01921E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NA	11	24	5.41521E+04	2.49324E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MG	12	27	5.68153E+02	3.93861E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AL	13	28	1.38629E+02	3.10265E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SI	14	31	9.43057E+03	1.33903E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	4.86990E-15	4.18329E-38	1.75462E-53	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
S	16	35	7.60030E+06	3.21101E-15	5.71314E-19	1.80730E-21	1.01725E-27	3.22256E-40	1.02088E-52	0.00000E+00	0.00000E+00
S	16	37	3.04012E+02	3.75739E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CL	17	36	9.77641E+12	2.35391E-18	2.35389E-18	2.35388E-18	2.35386E-18	2.35380E-18	2.35375E-18	2.35359E-18	2.35338E-18
AR	18	37	3.02684E+06	1.52200E-13	5.84629E-23	3.08926E-29	6.27069E-45	2.58339E-76	0.00000E+00	0.00000E+00	0.00000E+00
AR	18	39	8.48405E+09	5.85755E-16	5.81240E-16	5.78250E-16	5.70844E-16	5.56314E-16	5.42154E-16	5.01800E-16	4.52629E-16
AR	18	41	6.60140E+03	1.87092E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
K	19	40	4.10146E+16	3.16971E-21	3.16971E-21	3.16971E-21	3.16971E-21	3.16971E-21	3.16971E-21	3.16971E-21	3.16971E-21
K	19	42	4.47192E+04	8.61026E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CA	20	41	2.52053E+12	6.74647E-16	6.74630E-16	6.74618E-16	6.74588E-16	6.74530E-16	6.74471E-16	6.74296E-16	6.74062E-16
CA	20	45	1.42623E+07	2.65689E-13	2.66773E-15	1.24162E-16	5.80238E-20	1.26716E-26	2.76734E-33	2.88238E-53	0.00000E+00
CA	20	47	3.91608E+05	1.34473E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	46	7.25049E+06	3.51524E-14	4.12361E-18	9.88156E-21	2.77785E-27	2.19507E-40	1.73453E-53	0.00000E+00	0.00000E+00
SC	21	47	2.96217E+05	2.69234E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	48	1.58253E+05	8.65167E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	49	3.44649E+03	3.19793E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	50	1.03147E+02	1.56286E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	3.48315E+02	3.85936E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	49	2.85246E+07	2.62266E-20	2.62800E-21	5.66955E-22	1.22563E-23	5.72758E-27	2.67664E-30	2.73168E-40	1.30284E-53
V	23	52	2.02084E+02	1.01856E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	53	1.19922E+02	2.04416E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	54	5.50117E+01	2.79065E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39843E+06	1.61717E-14	2.11969E-26	2.53871E-34	3.98558E-54	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	1.75511E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	1.95617E-23	1.95617E-23	1.95617E-23	1.95617E-23	1.95616E-23	1.95616E-23	1.95615E-23	1.95614E-23
MN	25	54	2.61565E+07	1.99197E-14	1.62073E-15	3.04320E-16	4.64924E-18	1.08514E-21	2.53266E-25	3.22012E-36	9.55578E-51
MN	25	56	9.29152E+03	2.34378E-11	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	3.26746E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	4.67511E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	2.93216E-12	1.31753E-12	7.72929E-13	2.03747E-13	1.41577E-14	9.83777E-16	3.30069E-19	7.69517E-24
FE	26	59	3.89409E+06	3.59905E-14	1.72810E-21	2.28287E-26	1.44806E-38	5.82595E-63	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	60	3.15569E+12	4.57639E-29	4.57630E-29	4.57623E-29	4.57608E-29	4.57576E-29	4.57544E-29	4.57449E-29	4.57322E-29
FE	26	61	3.60001E+02	5.70974E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	57	2.34838E+07	1.81030E-19	1.10707E-20	1.71840E-21	1.63117E-23	1.46976E-27	1.32431E-31	9.68793E-44	6.38581E-60
CO	27	58	6.13405E+06	5.76222E-17	1.30166E-21	1.04017E-24	1.87760E-32	6.11840E-48	1.99368E-63	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	6.86866E-14	4.62565E-14	3.55391E-14	1.83882E-14	4.92274E-15	1.31787E-15	2.52856E-17	1.29880E-19
CO	27	61	5.94007E+03	5.[illegible]E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	62	8.34012E+02	2.72273E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00009E+00	0.00000E+00	0.00000E+00
CO	27	64	2.99999E-01	1.56229E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NI	28	59	2.52053E+12	1.81966E-19	1.81962E-19	1.81958E-19	1.81950E-19	1.81935E-19	1.81919E-19	1.81872E-19	1.81808E-19
NI	28	63	2.90020E+09	2.83330E-17	2.76991E-17	2.72844E-17	2.62746E-17	2.43658E-17	2.25957E-17	1.80201E-17	1.33271E-17
NI	28	65	9.21738E+03	1.89068E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CU	29	64	4.62098E+04	4.69120E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RB	37	86	1.60972E+06	3.22731E-20	6.37307E-38	1.00312E-49	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	87	1.00798E+04	1.81398E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	89	4.50096E+06	1.05758E-18	4.92569E-25	2.95965E-29	8.2827[illegible]E-40	6.40669E-61	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	90	8.86377E+08	2.60465E-23	2.49307E-23	2.37301E-23	2.0975[illegible]E-23	1.63884E-23	1.28045E-23	6.10710E-24	2.27580E-24
SR	38	91	3.48315E+04	2.42388E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	92	9.75604E+03	1.14675E-23	0.00000E+00	0.00000E+00	0.0000[illegible]E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	93	4.50095E+02	5.84799E-22	0.00000E+00	0.00000E+00	0.0000[illegible]E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	89	1.56998E+01	2.22306E-20	0.00000E+00	0.00000E+00	[illegible]E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	90	2.30281E+05	4.53300E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	91	5.09467E+06	2.76748E-19	7.08479E-25	1.32585E-28	6.35187E-38	1.45783E-56	3.34588E-75	0.00000E+00	0.00000E+00
Y	39	92	1.27440E+04	8.61401E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	94	1.12200E+03	1.86877E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	96	9.80406E+00	1.72325E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	88	7.20602E+06	4.25379E-22	4.71890E-26	1.08968E-28	2.79042E-35	1.83041E-46	1.20069E-61	0.00000E+00	0.00000E+00
ZR	40	89	2.82249E+05	4.69354E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	93	4.74758E+13	9.95061E-22	9.95059E-22	9.95058E-22	9.95056E-22	9.95052E-22	9.95047E-22	9.95033E-22	9.95015E-22
ZR	40	95	5.63534E+06	3.91037E-18	3.42740E-23	1.45703E-26	5.42898E-35	7.53712E-52	1.04639E-68	0.00000E+00	0.00000E+00
ZR	40	97	6.04848E+04	8.28203E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	91	2.20888E+10	1.73474E-23	1.72959E-23	1.72617E-23	1.71764E-23	1.70072E-23	1.68396E-23	1.63466E-23	1.57118E-23
NB	41	92	8.80746E+05	6.99635E-19	3.06688E-51	8.21404E-73	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	94	6.30134E+11	1.43037E-19	1.43022E-19	1.43012E-19	1.42987E-19	1.42938E-19	1.42888E-19	1.42739E-19	1.42541E-19
NB	41	95	3.02684E+06	8.29812E-20	3.18747E-29	1.68430E-35	3.41886E-51	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	96	8.28132E+04	1.63181E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	97	4.35217E+03	1.51171E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	98	3.06025E+03	4.66459E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	100	3.09994E+00	3.21281E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	93	2.84077E+11	1.26803E-21	1.26773E-21	1.26754E-21	1.26705E-21	1.26607E-21	1.26510E-21	1.26218E-21	1.25830E-21
MO	42	99	2.41515E+05	1.50843E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	101	8.76292E+02	7.31468E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	104	2.61565E+02	3.63294E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	106	7.84813E+03	1.92469E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PD	46	107	2.05134E+14	7.32909E-28	7.32909E-28	7.32908E-28	7.32908E-28	7.32907E-28	7.32906E-28	7.32904E-28	7.32901E-28
PD	46	109	4.83704E+04	1.92361E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	106	7.34422E+05	8.15358E-21	1.27701E-59	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	108	4.10389E+09	1.38877E-17	1.36674E-17	1.35224E-17	1.31668E-17	1.24834E-17	1.18354E-17	1.00865E-17	8.14980E-18
AG	47	110	2.15826E+07	2.33639E-15	1.11704E-16	1.47146E-17	9.26736E-20	3.67593E-24	1.45806E-28	9.09925E-42	2.25236E-59
CD	48	109	3.99508E+07	1.50463E-21	3.06596E-22	1.02564E-22	6.63835E-24	2.78094E-26	1.16500E-28	8.56487E-36	2.63785E-45
CD	48	111	2.92221E+03	3.97587E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	115	1.92541E+05	1.23171E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	117	1.22399E+04	3.70486E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	119	5.97541E+02	2.07836E-25	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	111	2.42444E+05	5.75125E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	112	1.25400E+03	3.20382E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	114	4.27869E+06	5.61987E-22	1.22731E-28	4.45087E-33	3.52509E-44	2.21102E-66	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	115	1.61497E+04	6.39458E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	116	1.40998E+01	2.91082E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	117	6.95931E+03	4.12125E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	118	2.63955E+02	1.50409E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	119	1.26027E+02	1.54465E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	120	4.40093E+01	3.31813E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	122	1.00998E+01	4.54057E-24	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	113	9.94473E+06	1.76606E-18	2.37839E-21	2.92258E-23	4.89195E-28	1.37054E-37	3.83980E-47	8.64408E-76	0.00000E+00
SN	50	121	9.72156E+04	8.75089E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	123	1.07967E+07	1.25656E-17	2.88102E-20	5.08942E-22	1.99711[illegible]-26	3.17398E-35	5.04436E-44	2.02498E-70	0.00000E+00
SN	50	125	8.12599E+05	1.57087E-16	1.33138E-51	5.53445E-75	0.0000[illegible]E+00	0.00000E+00	0.00090E+00	0.00000E+00	0.00000E+00

I	53	130	4.44981E+04	1.43896E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
XE	54	133	4.56018E+05	6.64410E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	132	5.58990E+05	6.46361E-19	6.71116E-70	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	134	6.47801E+07	6.83722E-15	2.48279E-15	1.26371E-15	2.33569E-16	7.97900E-18	2.72572E-19	1.08665E-23	1.47987E-29
EU	63	152	4.17559E+08	6.00658E-14	5.13305E-14	4.62246E-14	3.55729E-14	2.10675E-14	1.24768E-14	2.59168E-15	3.18823E-16
EU	63	154	2.69812E+08	6.00321E-15	4.70713E-15	4.00257E-15	2.66867E-15	1.18633E-15	5.27372E-16	4.63287E-17	1.80923E-18
LU	71	176	1.22687E+07	2.99633E-25	1.42451E-27	4.02764E-29	5.41397E-33	9.78233E-41	1.76751E-48	1.04262E-71	0.00000E+00
LU	71	177	1.38242E+07	1.29479E-22	1.12369E-24	4.74550E-26	1.73928E-29	2.33634E-36	3.13836E-43	7.60668E-64	0.00000E+00
HF	72	173	8.49653E+04	3.01162E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	175	6.04840E+06	3.69856E-16	7.18045E-21	5.18681E-24	7.27403E-32	1.43056E-47	2.81342E-63	0.00000E+00	0.00000E+00
HF	72	178	9.78261E+08	1.15392E-23	1.07905E-23	1.03186E-23	9.22713E-24	7.37833E-24	5.89996E-24	3.01663E-24	1.23335E-24
HF	72	179	1.89384E+10	5.50232E-25	5.48329E-25	5.47064E-25	5.43913E-25	5.37667E-25	5.31493E-25	5.13392E-25	4.90213E-25
HF	72	180	1.98723E+04	1.17639E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	181	3.66357E+06	2.64343E-15	4.39587E-23	2.86394E-28	3.10294E-41	3.64211E-67	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	182	2.84077E+14	5.76607E-30	5.76607E-30	5.76607E-30	5.76607E-30	5.76606E-30	5.76606E-30	5.76605E-30	5.76603E-30
TA	73	180	2.93458E+04	1.40638E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TA	73	182	9.89362E+06	4.29558E-15	5.65514E-18	6.79292E-20	1.07424E-24	2.68639E-34	6.71794E-44	1.05061E-72	0.00000E+00
W	74	181	1.20968E+07	1.04440E-18	4.60178E-21	1.23680E-22	1.46467E-26	2.05404E-34	2.88056E-42	7.94477E-66	0.00000E+00
W	74	185	6.47801E+06	1.98516E-16	7.91400E-21	9.23557E-24	4.29681E-31	9.29968E-46	2.01287E-60	0.00000E+00	0.00000E+00
W	74	187	8.59964E+04	3.91784E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	203	4.02525E+05	4.04806E-21	3.36589E-28	6.41204E-33	1.01568E-44	2.54826E-68	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	205	3.11947E+02	3.11487E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	204	1.19282E+08	4.12863E-23	2.38167E-23	1.65043E-23	6.59769E-24	1.05433E-24	1.68486E-25	6.87575E-28	4.48396E-31
TL	81	206	2.52054E+02	7.25987E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	207	2.86188E+02	5.94395E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	203	1.86782E+05	1.56733E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	205	4.76390E+14	7.14842E-24	7.14842E-24	7.14842E-24	7.14842E-24	7.14841E-24	7.14841E-24	7.14840E-24	7.14839E-24
PB	82	207	7.95789E-01	1.56035E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
			TOTAL (CURIES/CC)	3.30202E-11	1.46977E-12	8.99005E-13	2.90036E-13	5.86146E-14	2.56663E-14	5.56274E-15	1.56980E-15
			TOTAL (CURIES)	3.19536E-04	1.42230E-05	8.69967E-06	2.80668E-06	5.67213E-07	2.48373E-07	5.38306E-08	1.61587E-08

COMPONENT : CONCRETE - AXIAL DOWN - EIGHTH 6 INCHES - R5
VOLUME : 9.67700E+06 CC
: ABOVE VOLUME IS FOR THE EIGHTH 6 INCHES OF CONCRETE
: IN THE AXIAL DOWN DIRECTION.
:
: (INTERVALS 77-79 TOTGDNR5)

NUCLIDE SYM	Z	N	HALF-LIFE (SECONDS)	CONCENTRATION (CURIES/CC) AT TIME SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
H	1	3	3.87233E+08	1.07192E-14	9.04824E-15	8.08164E-15	6.09306E-15	3.46348E-15	1.96874E-15	3.61588E-16	3.77498E-17
HE	2	6	8.09751E-01	9.09206E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
LI	3	8	8.40178E-01	2.83789E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	8	3.00064E-16	2.57793E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	10	7.88563E+13	7.25379E-25	7.25378E-25	7.25378E-25	7.25377E-25	7.25375E-25	7.25373E-25	7.25366E-25	7.25358E-25
B	5	12	1.99754E-02	3.91493E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
C	6	14	1.80978E+11	5.27619E-18	5.27428E-18	5.27300E-18	5.26982E-18	5.26345E-18	5.25709E-18	5.23807E-18	5.21280E-18
F	9	20	1.10023E+01	1.48001E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NE	10	23	3.76710E+01	1.87660E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NA	11	24	5.41521E+04	5.40850E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MG	12	27	5.68153E+02	9.16984E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AL	13	28	1.38629E+02	6.80055E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SI	14	31	9.43057E+03	5.04778E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	1.11181E-15	9.55050E-39	4.00581E-54	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
S	16	35	7.60030E+06	6.96571E-16	1.23936E-19	3.92062E-22	2.20674E-28	6.99078E-41	2.21442E-53	0.00000E+00	0.00000E+00
S	16	37	3.04012E+02	8.81018E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CL	17	36	9.77641E+12	5.11133E-19	5.11130E-19	5.11128E-19	5.11122E-19	5.11111E-19	5.11099E-19	5.11065E-19	5.11019E-19
AR	18	37	3.02684E+06	3.52783E-14	1.35511E-23	7.16058E-30	1.45348E-45	5.98802E-77	0.00000E+00	0.00000E+00	0.00000E+00
AR	18	39	8.48405E+09	1.29359E-16	1.28363E-16	1.27702E-16	1.26067E-16	1.22858E-16	1.19731E-16	1.10819E-16	9.99599E-17
AR	18	41	6.60140E+03	4.35557E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
K	19	40	4.10146E+16	6.87122E-22	6.87122E-22	6.87122E-22	6.87122E-22	6.87122E-22	6.87122E-22	6.87122E-22	6.87122E-22
K	19	42	4.47192E+04	1.86693E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CA	20	41	2.52053E+12	1.46231E-16	1.46227E-16	1.46224E-16	1.46218E-16	1.46205E-16	1.46193E-16	1.46155E-16	1.46104E-16
CA	20	45	1.42623E+07	5.76155E-14	5.78507E-16	2.69249E-17	1.25827E-20	2.74789E-27	6.00107E-34	6.25055E-54	0.00000E+00
CA	20	47	3.91608E+05	2.91475E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	46	7.25049E+06	7.62607E-15	8.94589E-19	2.14374E-21	6.02636E-28	4.76207E-41	3.76296E-54	0.00000E+00	0.00000E+00
SC	21	47	2.96217E+05	6.15346E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	48	1.58253E+05	2.05346E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	49	3.44849E+03	7.42041E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	50	1.03147E+02	3.76228E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	3.48315E+02	8.36975E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	49	2.85246E+07	6.31655E-21	6.32943E-22	1.36549E-22	2.95187E-24	1.37946E-27	6.44656E-31	6.57914E-41	3.13783E-54
V	23	52	2.82084E+02	2.20804E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	53	1.19922E+02	4.80624E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	54	5.50117E+01	6.71943E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39843E+06	3.52098E-15	4.61510E-27	5.52740E-35	8.67757E-55	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	4.08038E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	4.71136E-24	4.71135E-24	4.71135E-24	4.71135E-24	4.71134E-24	4.71133E-24	4.71130E-24	4.71127E-24
MN	25	54	2.61565E+07	4.56508E-15	3.71431E-16	6.97425E-17	1.06549E-18	2.48686E-22	5.80422E-26	7.37970E-37	2.18994E-51
MN	25	56	9.29152E+03	5.08237E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	7.65047E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	1.12299E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	6.35569E-13	2.85584E-13	1.67538E-13	4.41638E-14	3.06880E-15	2.13241E-16	7.15450E-20	1.66799E-24
FE	26	59	3.89409E+06	7.80460E-15	3.74740E-22	4.95044E-27	3.14015E-39	1.26337E-63	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	60	3.15569E+12	1.10176E-29	1.10173E-29	1.10172E-29	1.10168E-29	1.10160E-29	1.10153E-29	1.10130E-29	1.10099E-29
FE	26	61	3.60001E+02	1.37512E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	57	2.34038E+07	4.35909E-20	2.66575E-21	4.13780E-22	3.92776E-24	3.53909E-28	3.18887E-32	2.33280E-44	1.53767E-60
CO	27	58	6.13405E+06	1.31818E-17	2.97770E-22	2.37952E-25	4.29542E-33	1.39966E-48	4.56079E-64	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	1.48977E-14	1.00327E-14	7.70818E-15	3.98628E-15	1.06771E-15	2.55837E-16	5.48428E-18	2.81700E-20
CO	27	61	5.94607E+03	1.25783E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	62	8.34012E+02	6.46063E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00

CO	27	60	2.99990E-01	3.76258E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NI	28	59	2.52053E+12	3.94460E-20	3.94457E-20	3.94451E-20	3.94433E-20	3.94399E-20	3.94366E-20	3.94262E-20	3.94125E-20
NI	28	63	2.90029E+09	6.17013E-18	6.03209E-18	5.96178E-18	5.77188E-18	5.30620E-18	4.92071E-18	3.92429E-18	2.90227E-18
NI	28	65	9.21738E+03	4.40393E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CU	29	64	4.62098E+04	1.01710E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RB	37	86	1.60972E+06	7.73733E-22	1.52792E-30	2.40495E-50	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	87	1.00799E+06	4.52369E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	89	4.59090E+06	2.40443E-19	1.15713E-25	6.95273E-30	1.94576E-40	1.52384E-61	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	90	8.06377E+00	6.37323E-24	5.91844E-24	5.63342E-24	4.97948E-24	3.89053E-24	3.03972E-24	1.44980E-24	5.40264E-25
SR	38	91	3.40315E+04	5.77660E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	92	9.75604E+03	2.75944E-24	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	93	4.50095E+02	1.40741E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	89	1.56990E-01	5.36641E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	90	2.30281E+05	9.02677E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	91	5.09667E+06	6.53400E-20	1.67271E-25	3.13031E-29	1.49967E-38	3.44191E-57	7.89958E-76	0.00000E+00	0.00000E+00
Y	39	92	1.27440E+06	2.04706E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	94	1.12200E+03	4.47393E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	96	9.80406E+00	4.15022E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	88	7.20602E+06	9.97041E-23	1.10606E-26	2.55361E-29	6.56043E-36	4.29029E-49	2.81428E-62	0.00000E+00	0.00000E+00
ZR	40	89	2.82249E+05	1.11247E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	93	4.74758E+13	2.16313E-22	2.16313E-22	2.16312E-22	2.16312E-22	2.16311E-22	2.16310E-22	2.16307E-22	2.16303E-22
ZR	40	95	5.63534E+06	9.41570E-19	8.25278E-24	3.50835E-27	1.30723E-35	1.81485E-52	2.51958E-69	0.00000E+00	0.00000E+00
ZR	40	97	6.04840E+04	1.81566E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	91	2.20888E+10	4.16331E-24	4.15096E-24	4.14275E-24	4.12228E-24	4.08166E-24	4.04144E-24	3.92314E-24	3.77078E-24
NB	41	92	8.80746E+05	1.66928E-19	7.31717E-52	1.95981E-73	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	94	6.30134E+11	3.10867E-20	3.10835E-20	3.10814E-20	3.10760E-20	3.10652E-20	3.10544E-20	3.10221E-20	3.09790E-20
NB	41	95	3.02684E+06	1.95622E-20	7.51422E-30	3.97063E-36	8.05971E-52	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	96	8.28132E+04	3.87549E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	97	4.33217E+03	3.57595E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	98	3.06025E+03	1.11538E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	100	3.09994E+00	7.73300E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	93	2.84077E+11	2.79040E-22	2.78983E-22	2.78940E-22	2.78833E-22	2.78618E-22	2.78404E-22	2.77761E-22	2.76907E-22
MO	42	99	2.41515E+05	3.29673E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	101	8.76292E+02	1.59556E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	104	2.61565E+02	8.66911E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	106	7.84813E+03	4.53432E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PD	46	107	2.05134E+14	1.73391E-28	1.73391E-28	1.73391E-28	1.73391E-28	1.73391E-28	1.73391E-28	1.73390E-28	1.73389E-28
PD	46	109	4.83704E+04	4.54769E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	106	7.34422E+05	1.96375E-21	3.07561E-60	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	108	4.10389E+09	3.01353E-18	2.96573E-18	2.93428E-18	2.85711E-18	2.70881E-18	2.56821E-18	2.18870E-18	1.76645E-18
AG	47	110	2.15826E+07	5.08145E-16	2.42947E-17	3.20031E-18	2.01558E-20	7.99485E-25	3.17116E-29	1.97901E-42	4.09870E-60
CD	48	109	3.99508E+07	3.76306E-22	7.24213E-23	2.42266E-23	1.56805E-24	6.56088E-27	2.75186E-29	2.02312E-36	6.23089E-46
CD	48	111	2.92221E+03	9.43618E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	115	1.92541E+05	2.95268E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	117	1.22399E+04	8.92287E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	119	5.97541E+02	5.00564E-26	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	111	2.42444E+05	1.37898E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	112	1.25400E+03	7.56914E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	114	4.27069E+06	1.33234E-22	2.90966E-29	1.05519E-33	8.35714E-45	5.24181E-67	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	115	1.61497E+04	1.51136E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	116	1.40996E+01	6.93288E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	117	6.95931E+03	9.75419E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	118	2.63955E+02	3.60117E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	119	1.26027E+02	3.66574E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	120	4.40093E+01	7.98069E-25	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	122	1.00998E+01	1.09358E-24	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	113	9.94473E+06	3.03787E-19	5.22775E-22	6.42388E-24	1.07576E-28	3.01247E-38	8.43995E-48	1.85602E-76	0.00000E+00
SN	50	121	9.72156E+04	1.90286E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	123	1.07967E+07	2.74441E-18	6.29233E-21	1.09409E-22	4.36180E-27	6.93216E-36	1.10172E-44	4.42269E-71	0.00000E+00
SN	50	125	8.12599E+05	3.41306E-17	2.09272E-52	1.20268E-75	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
I	53	130	4.44981E+04	3.30966E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
XE	54	133	4.56018E+05	1.56201E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	132	5.50990E+05	1.55668E-19	1.61635E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	134	6.47801E+07	1.40667E-15	5.39700E-16	2.74741E-16	5.07799E-17	1.73470E-18	5.92596E-20	2.36247E-24	3.21737E-30
EU	63	152	4.17559E+08	1.30194E-14	1.11260E-14	1.00193E-14	7.71050E-15	4.56641E-15	2.70438E-15	5.61751E-16	6.91055E-17
EU	63	154	2.69812E+08	1.30230E-15	1.02116E-15	8.60293E-16	5.70925E-16	2.57355E-16	1.14605E-16	1.00503E-17	3.92484E-19
LU	71	174	1.22607E+07	6.94574E-26	3.30212E-28	9.33640E-30	1.25500E-33	2.26762E-41	4.09723E-49	2.41680E-72	0.00000E+00
LU	71	177	1.30242E+07	3.05962E-23	2.65578E-25	1.12130E-26	4.10997E-30	5.52085E-37	7.41604E-44	1.79753E-64	0.00000E+00
HF	72	173	8.49655E+04	7.25335E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	175	6.04840E+06	8.02520E-17	1.57803E-21	1.12546E-24	1.57833E-32	3.10405E-40	6.10462E-48	0.00000E+00	0.00000E+00
HF	72	178	9.78261E+08	2.73857E-24	2.51099E-24	2.44809E-24	2.18906E-24	1.75100E-24	1.40023E-24	7.15932E-25	2.92709E-25
HF	72	179	1.89384E+10	1.30262E-25	1.29811E-25	1.29512E-25	1.28766E-25	1.27287E-25	1.25826E-25	1.21540E-25	1.16053E-25
HF	72	180	1.98723E+04	2.70962E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	181	3.66357E+06	5.74718E-16	1.55772E-24	6.22660E-29	6.74622E-42	7.91044E-60	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	182	2.84077E+14	1.37264E-30	1.37264E-30	1.37264E-30	1.37264E-30	1.37264E-30	1.37263E-30	1.37263E-30	1.37263E-30
TA	73	180	2.93458E+04	3.30422E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TA	73	182	9.89362E+06	9.35466E-16	1.23153E-16	1.47931E-20	2.33939E-25	5.85019E-35	1.46298E-44	2.28794E-73	0.00000E+00
W	74	181	1.20968E+07	2.51531E-19	1.10029E-21	2.97869E-23	3.52750E-27	4.94692E-35	6.93750E-43	1.91341E-66	0.00000E+00
W	74	185	6.47801E+06	6.32108E-17	1.72264E-21	2.01030E-26	9.35283E-32	2.02430E-46	4.38140E-61	0.00000E+00	0.00000E+00
W	74	187	8.59984E+04	8.51072E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	203	4.02525E+06	9.64659E-22	8.02095E-29	1.52000E-33	2.42039E-45	6.07254E-69	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	205	3.11947E+02	7.47078E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	204	1.19282E+08	9.80925E-24	5.65863E-24	3.92129E-24	1.56755E-24	2.50500E-25	4.00307E-26	1.63362E-28	1.06535E-31
TL	81	206	2.52054E+02	1.73290E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	207	2.86188E+02	1.41593E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	203	1.86782E+05	3.77479E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	205	4.76390E+14	1.72110E-24	1.72110E-24	1.72110E-24	1.72110E-24	1.72110E-24	1.72110E-24	1.72110E-24	1.72110E-24
PB	82	209	7.95909E-01	3.75249E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TOTAL (CURIES/CC)				7.17119E-12	3.10617E-13	1.96879E-13	6.28731E-14	1.27084E-14	5.56591E-15	1.20785E-15	3.63805E-16
TOTAL (CURIES)				6.93956E-05	3.08326E-06	1.88564E-06	6.08423E-07	1.22979E-07	5.38613E-08	1.16884E-08	3.52054E-09

COMPONENT : CONCRETE - AXIAL DOWN - NINTH ... ES - RS
VOLUME : 9.67700E+06 CC
: ABOVE VOLUME IS FOR THE NINTH 6 ...HES OF CONCRETE
: IN THE AXIAL DOWN DIRECTION.
:
: (INTERVALS 80-82 TOTGDMRS)

NUCLIDE SYM	Z	A	HALF-LIFE (SECONDS)	CONCENTRATION (CURIES/CC) AT TIME SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
H	1	3	3.87233E+08	2.32571E-15	1.96317E-15	1.75345E-15	1.32200E-15	7.51462E-16	4.27152E-16	7.84528E-17	8.19046E-18
HE	2	6	8.09751E-01	2.26672E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
LI	3	8	8.40178E-01	6.15847E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	8	3.06064E-16	5.88872E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	10	7.88563E+13	1.65419E-25	1.65419E-25	1.65419E-25	1.65419E-25	1.65418E-25	1.65418E-25	1.65416E-25	1.65415E-25
B	5	12	1.99754E-02	8.49488E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
C	6	14	1.80978E+11	1.14519E-18	1.14478E-18	1.14450E-18	1.14381E-18	1.14243E-18	1.14105E-18	1.13692E-18	1.13144E-18
F	9	20	1.10023E+01	3.53722E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NE	10	23	3.76710E+01	4.40751E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NA	11	24	5.41521E+04	1.17462E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MG	12	27	5.68153E+02	2.14397E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AL	13	28	1.38629E+02	1.49381E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SI	14	31	9.43057E+03	6.97758E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	2.55285E-16	2.19292E-39	9.19787E-55	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
S	16	35	7.60030E+06	1.51233E-16	2.69078E-20	8.51205E-23	4.79106E-29	1.51777E-41	4.80816E-54	0.00000E+00	0.00000E+00
S	16	37	3.04012E+02	2.07291E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CL	17	36	9.77641E+12	1.11178E-19	1.11177E-19	1.11177E-19	1.11175E-19	1.11173E-19	1.11170E-19	1.11163E-19	1.11153E-19
AR	18	37	3.02684E+06	6.21523E-15	3.15562E-26	1.66748E-30	3.38470E-46	1.39442E-77	0.00000E+00	0.00000E+00	0.00000E+00
AR	18	39	8.48405E+09	2.86683E-17	2.84475E-17	2.83011E-17	2.79387E-17	2.72275E-17	2.65345E-17	2.45595E-17	2.21529E-17
AR	18	41	6.60140E+03	1.01829E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
K	19	40	4.10146E+16	1.49105E-22	1.49105E-22	1.49105E-22	1.49105E-22	1.49105E-22	1.49105E-22	1.49105E-22	1.49105E-22
K	19	42	4.47192E+04	4.05357E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CA	20	41	2.52053E+12	3.17138E-17	3.17130E-17	3.17125E-17	3.17111E-17	3.17083E-17	3.17056E-17	3.16973E-17	3.16863E-17
CA	20	45	1.42673E+07	1.25114E-14	1.25624E-16	5.84682E-18	2.73236E-21	5.96712E-28	1.30315E-34	1.35732E-54	0.00000E+00
CA	20	47	3.91608E+05	6.32147E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	46	7.25049E+06	1.65709E-15	1.94388E-19	4.65820E-22	1.30949E-28	1.03476E-41	8.17665E-55	0.00000E+00	0.00000E+00
SC	21	47	2.96217E+05	1.41454E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	48	1.58253E+05	4.88615E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	49	3.44849E+03	1.72976E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	50	1.03147E+02	9.06476E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	3.48315E+02	1.81719E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	49	2.85246E+07	1.52255E-21	1.52565E-22	3.29138E-23	7.11521E-25	3.32507E-28	1.55309E-31	1.58584E-41	7.56344E-55
V	23	52	2.02084E+02	4.79494E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	53	1.19922E+02	1.13370E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	54	5.50117E+01	1.61929E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39843E+06	7.68700E-16	1.00757E-27	1.20674E-35	1.89449E-55	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	9.52701E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	1.13563E-24	1.13563E-24	1.13563E-24	1.13562E-24	1.13562E-24	1.13562E-24	1.13561E-24	1.13561E-24
MN	25	54	2.61565E+07	1.05195E-15	8.55903E-17	1.60711E-17	2.45525E-19	5.73058E-23	1.33749E-26	1.70054E-37	5.04637E-52
MN	25	56	9.29152E+03	1.10395E-12	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	1.79795E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	2.70042E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	1.37851E-13	6.19414E-14	3.63381E-14	9.57887E-15	6.65605E-16	4.62508E-17	1.55177E-20	3.61777E-25
FE	26	59	3.89409E+06	1.69552E-15	8.14111E-23	1.07547E-27	6.82187E-40	2.74463E-64	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	60	3.15569E+12	2.65472E-30	2.65467E-30	2.65463E-30	2.65454E-30	2.65436E-30	2.65417E-30	2.65362E-30	2.65288E-30
FE	26	61	3.60001E+02	3.31453E-24	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	57	2.34838E+07	1.05052E-20	6.42435E-22	9.97192E-23	9.46573E-25	8.52906E-29	7.68503E-33	5.62194E-45	3.70571E-61
CO	27	58	6.13405E+06	3.03270E-18	6.85072E-23	5.47450E-26	9.88235E-34	3.22016E-49	1.04929E-64	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	3.23883E-15	2.18116E-15	1.67580E-15	8.67073E-16	2.32125E-16	6.21425E-17	1.19231E-18	6.12430E-21
CO	27	61	5.94007E+03	2.94017E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	62	8.34012E+02	1.53652E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	64	2.99999E-01	9.06908E-24	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NI	28	59	2.52053E+12	8.56067E-21	8.55904E-21	8.55969E-21	8.55932E-21	8.55858E-21	8.55704E-21	8.55561E-21	8.55264E-21
NI	28	63	2.90020E+09	1.34558E-18	1.31547E-18	1.29570E-18	1.24782E-18	1.15717E-18	1.07310E-18	8.55805E-19	6.32925E-19
NI	28	65	9.21738E+03	1.03024E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CU	29	64	4.62098E+04	2.20822E-15	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RB	37	86	1.60972E+06	1.85735E-21	3.66777E-39	5.77308E-51	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	87	1.00799E+04	1.03245E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	89	4.50096E+06	5.85672E-20	2.72778E-26	1.63901E-30	4.58687E-41	3.59224E-62	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	90	8.86377E+08	1.51643E-24	1.40822E-24	1.34040E-24	1.10481E-24	9.25703E-25	7.23264E-25	3.44961E-25	1.28549E-25
SR	38	91	3.48315E+04	1.37911E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	92	9.75604E+03	6.63238E-25	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	93	4.50095E+02	3.39016E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	89	1.56998E+01	1.28787E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	90	2.30281E+05	2.13243E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	91	5.09667E+06	1.54723E-20	3.96093E-26	7.41249E-30	3.55118E-39	8.15036E-58	1.87060E-76	0.00000E+00	0.00000E+00
Y	39	92	1.27440E+04	4.87514E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	94	1.12200E+03	1.07259E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	96	9.80406E+00	1.00034E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	88	7.20602E+06	2.34507E-23	2.60149E-27	6.08618E-30	1.53833E-36	1.08909E-49	6.61927E-63	0.00000E+00	0.00000E+00
ZR	40	89	2.82249E+05	2.64340E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	93	4.74758E+13	4.71137E-23	4.71136E-23	4.71136E-23	4.71135E-23	4.71133E-23	4.71130E-23	4.71124E-23	4.71115E-23
ZR	40	95	5.65534E+06	2.26909E-19	1.98883E-24	8.45476E-28	3.15030E-36	4.37360E-53	6.07193E-70	0.00000E+00	0.00000E+00
ZR	40	97	6.04840E+04	4.09598E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	91	2.20888E+10	1.00034E-24	9.97374E-25	9.95400E-25	9.90484E-25	9.80724E-25	9.71060E-25	9.42636E-25	9.06027E-25
NB	41	92	8.80746E+05	3.99049E-20	1.74920E-52	4.68503E-74	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	94	6.30134E+11	6.80683E-21	6.80612E-21	6.80565E-21	6.80447E-21	6.80211E-21	6.79974E-21	6.79267E-21	6.78324E-21
NB	41	95	3.02685E+06	4.62610E-21	1.77697E-30	9.38978E-37	1.90597E-52	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	96	8.28132E+04	9.22409E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	97	4.33217E+03	8.48205E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	98	3.06025E+03	2.67118E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	100	3.09994E+00	1.86332E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	93	2.84077E+11	6.33878E-23	6.33732E-23	6.33634E-23	6.33390E-23	6.32902E-23	6.32415E-23	6.30956E-23	6.29016E-23
MO	42	99	2.41515E+05	7.33944E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	101	8.76292E+02	3.53727E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	104	2.61565E+02	2.07227E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	196	7.84813E+03	1.07134E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PD	46	107	2.05134E+14	4.11348E-29	4.11348E-29	4.11348E-29	4.11347E-29	4.11347E-29	4.11346E-29	4.11345E-29	4.11343E-29
PD	46	109	4.83704E+04	1.07823E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	106	7.34422E+05	4.73345E-22	7.41347E-61	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	108	4.10389E+09	6.56252E-19	6.45842E-19	6.38994E-19	6.22189E-19	5.89894E-19	5.59276E-19	4.76630E-19	3.85113E-19
AG	47	110	2.15826E+07	1.11581E-16	5.33473E-18	7.02739E-19	4.42589E-21	1.75554E-25	6.96338E-30	4.34561E-43	1.07568E-60
CD	48	199	3.99508E+07	8.86734E-23	1.71567E-23	5.73931E-24	3.71473E-25	1.55617E-27	6.51919E-30	4.79278E-37	1.47610E-46
CD	48	111	2.92221E+03	2.24481E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	115	1.92541E+05	7.08739E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	117	1.22399E+04	2.15075E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	119	5.97541E+02	1.20656E-26	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	111	2.42444E+05	3.31055E-24	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	112	1.25400E+03	1.79345E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	114	4.27869E+06	3.16653E-23	6.91533E-30	2.50785E-34	1.90622E-45	1.24581E-67	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	115	1.61497E+04	3.58242E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	116	1.40998E+01	1.65440E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	117	6.95931E+03	2.31485E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	118	2.63955E+02	8.63415E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	119	1.26027E+02	8.71995E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	120	4.40093E+01	1.92498E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	122	1.00998E+01	2.63597E-25	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	113	9.94473E+06	8.71798E-20	1.18752E-22	1.45923E-24	2.44253E-29	6.84304E-39	1.91719E-48	4.21609E-77	0.00000E+00
SN	50	121	9.72156E+04	4.16329E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	123	1.07967E+07	6.03100E-19	1.38277E-21	2.40432E-23	9.58530E-28	1.52338E-36	2.42109E-45	9.71910E-72	0.00000E+00
SN	50	125	8.12599E+05	7.46559E-18	6.32741E-53	2.63026E-76	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00

I	53	130	4.46981E+04	8.00665E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
XE	54	133	4.56018E+05	3.68520E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	132	5.58990E+05	3.75224E-20	3.89607E-71	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	134	6.47801E+07	3.25946E-16	1.18360E-16	6.02439E-17	1.11348E-17	3.80377E-19	1.29942E-20	5.18030E-25	7.05489E-31
EU	63	152	4.17559E+08	2.82396E-15	2.41327E-15	2.17323E-15	1.67264E-15	9.90675E-16	5.86591E-16	1.21846E-16	1.49803E-17
EU	63	156	2.69812E+08	2.83346E-16	2.22172E-16	1.88918E-16	1.25959E-16	5.59937E-17	2.48915E-17	2.18667E-18	8.53940E-20
LU	71	176	1.22587E+07	1.61817E-26	7.69307E-29	2.17513E-30	2.92381E-34	5.28294E-42	9.54542E-50	5.63068E-73	0.00000E+00
LU	71	177	1.58242E+07	7.25130E-24	6.29312E-26	2.65766E-27	9.74064E-31	1.30844E-37	1.75760E-44	4.26015E-65	0.00000E+00
HF	72	173	8.49653E+04	1.74836E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	175	6.04840E+06	1.74694E-17	3.39155E-22	2.44989E-25	3.43575E-33	6.75696E-49	1.32887E-64	0.00000E+00	0.00000E+00
HF	72	178	9.78261E+08	6.51504E-25	6.09235E-25	5.82590E-25	5.20965E-25	4.16581E-25	3.33112E-25	1.76320E-25	6.96352E-26
HF	72	179	1.89384E+10	3.09219E-26	3.08150E-26	3.07439E-26	3.05669E-26	3.02158E-26	2.98688E-26	2.88518E-26	2.75490E-26
HF	72	180	1.98723E+04	6.64140E-24	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	181	3.66357E+06	1.26086E-16	2.09673E-24	1.36604E-29	1.48003E-42	1.73720E-68	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	182	2.84677E+14	3.27416E-31	3.27416E-31	3.27416E-31	3.27416E-31	3.27415E-31	3.27415E-31	3.27414E-31	3.27413E-31
TA	73	180	2.93650E+04	8.15091E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TA	73	182	9.89362E+06	2.06337E-16	2.71643E-19	3.26296E-21	5.16009E-26	1.29040E-35	3.22694E-45	5.04659E-76	0.00000E+00
W	74	181	1.20960E+07	6.06280E-20	2.67137E-22	7.17972E-24	8.50253E-28	1.19238E-35	1.67219E-43	4.61200E-67	0.00000E+00
W	74	185	6.47801E+06	9.48429E-18	3.78099E-22	4.41239E-25	2.05284E-32	4.44311E-47	9.61669E-62	0.00000E+00	0.00000E+00
W	74	187	8.59984E+04	1.86878E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	203	4.02525E+06	2.30305E-22	1.91494E-29	3.64799E-34	5.77851E-46	1.44978E-69	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	205	3.11947E+02	1.79401E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	204	1.19282E+08	2.33593E-24	1.34752E-24	9.33796E-25	3.73289E-25	5.96528E-26	9.53271E-27	3.89021E-29	2.53697E-32
TL	81	206	2.52054E+02	4.14337E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	207	2.86188E+02	3.37028E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	203	1.86782E+05	9.09866E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	205	4.76390E+14	4.14735E-25	4.14735E-25	4.14735E-25	4.14735E-25	4.14735E-25	4.14735E-25	4.14734E-25	4.14733E-25
PB	82	207	7.95989E-01	9.03303E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TOTAL (CURIES/CC)				1.55999E-12	6.91198E-14	4.22756E-14	1.36405E-14	2.75799E-15	1.20818E-15	2.62546E-16	7.93867E-17
TOTAL (CURIES)				1.50960E-05	6.68873E-07	4.09101E-07	1.31999E-07	2.66891E-08	1.16916E-08	2.54066E-09	7.68225E-10

COMPONENT : CONCRETE - AXIAL DOWN - TENTH 6 INCHES - R5
VOLUME : 9.67700E+06 CC
: ABOVE VOLUME IS FOR THE TENTH 6 INCHES OF CONCRETE
: IN THE AXIAL DOWN DIRECTION.
:
: (INTERVALS 83-85 TOTGDNRS)

NUCLIDE SYM	Z	N	HALF-LIFE (SECONDS)	CONCENTRATION (CURIES/CC) AT TIME SHUTDOWN	3.00 YRS	5.00 YRS	10.00 YRS	20.00 YRS	30.00 YRS	60.00 YRS	100.00 YRS
H	1	3	3.87233E+08	4.35000E-16	3.67191E-16	3.27964E-16	2.47266E-16	1.40553E-16	7.98943E-17	1.46738E-17	1.53194E-18
HE	2	6	8.09751E-01	5.08522E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
LI	3	8	8.40178E-01	1.15244E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	8	3.09064E-16	1.31239E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
BE	4	10	7.88563E+13	3.62086E-26	3.62085E-26	3.62085E-26	3.62085E-26	3.62084E-26	3.62083E-26	3.62080E-26	3.62076E-26
B	5	12	1.99754E-02	1.50906E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
C	6	14	1.80978E+11	2.14471E-19	2.14393E-19	2.14342E-19	2.14212E-19	2.13953E-19	2.13695E-19	2.12922E-19	2.11895E-19
F	9	20	1.10023E+01	8.35393E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NE	10	23	3.76710E+01	1.62237E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NA	11	24	5.41521E+04	2.20228E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MG	12	27	5.68153E+02	4.94285E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AL	13	28	1.38629E+02	2.90123E-14	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SI	14	31	9.43057E+03	1.56053E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
P	15	32	1.23556E+06	5.73424E-17	4.92576E-40	2.06603E-55	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
S	16	35	7.60030E+06	2.83770E-17	5.04093E-21	1.59718E-23	8.98986E-30	2.84791E-42	9.02193E-55	0.00000E+00	0.00000E+00
S	16	37	3.04012E+02	4.61825E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CL	17	36	9.77641E+12	2.09382E-20	2.09381E-20	2.09380E-20	2.09378E-20	2.09373E-20	2.09368E-20	2.09354E-20	2.09336E-20
AR	18	37	3.02604E+06	1.80271E-15	7.23184E-25	3.82141E-31	7.75683E-47	3.19565E-78	0.00000E+00	0.00000E+00	0.00000E+00
AR	18	39	8.48405E+09	5.77378E-18	5.72979E-18	5.69982E-18	5.62682E-18	5.48360E-18	5.34402E-18	4.94626E-18	4.46157E-18
AR	18	41	6.60140E+03	2.34848E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
K	19	40	4.10146E+16	2.78937E-23	2.78937E-23	2.78937E-23	2.78937E-23	2.78937E-23	2.78937E-23	2.78937E-23	2.78937E-23
K	19	42	4.47192E+04	7.57111E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CA	20	41	2.52053E+12	5.93055E-18	5.93040E-18	5.93029E-18	5.93004E-18	5.92952E-18	5.92901E-18	5.92746E-18	5.92541E-18
CA	20	45	1.42623E+07	2.34473E-15	2.35429E-17	1.09574E-18	5.12044E-22	1.11828E-28	2.44220E-35	2.54373E-55	0.00000E+00
CA	20	47	3.91608E+05	1.18217E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	46	7.25049E+06	3.10839E-16	3.64635E-20	8.73788E-23	2.45634E-29	1.94102E-42	1.53378E-55	0.00000E+00	0.00000E+00
SC	21	47	2.96217E+05	3.27847E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	48	1.58253E+05	1.14868E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	49	3.44049E+03	3.97343E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SC	21	50	1.03147E+02	2.15645E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TI	22	51	3.48315E+02	3.40462E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	49	2.85246E+07	3.62340E-22	3.63079E-23	7.83292E-24	1.69336E-25	7.91309E-29	3.69798E-32	3.77403E-42	1.79997E-55
V	23	52	2.02084E+02	8.98099E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	53	1.19922E+02	2.64182E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
V	23	54	5.50117E+01	3.85287E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	51	2.39843E+06	1.46059E-16	1.91446E-28	2.29291E-36	3.59968E-56	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CR	24	55	2.10045E+02	2.19461E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	53	1.16760E+14	2.70259E-25	2.70259E-25	2.70259E-25	2.70259E-25	2.70258E-25	2.70256E-25	2.70256E-25	2.70254E-25
MN	25	54	2.61565E+07	2.37731E-16	1.93426E-17	3.63191E-18	5.54864E-20	1.29506E-23	3.02261E-27	3.84306E-38	1.14044E-52
MN	25	56	9.29152E+03	2.06762E-13	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	57	1.01933E+02	4.17105E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MN	25	58	6.60140E+01	6.41326E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	55	8.20292E+07	2.57827E-14	1.15851E-14	6.79641E-15	1.79156E-15	1.24490E-16	8.65040E-18	2.90232E-21	6.76641E-26
FE	26	59	3.69409E+06	3.17618E-16	1.52505E-23	2.01465E-28	1.27792E-40	5.14144E-65	0.00000E+00	0.00000E+00	0.00000E+00
FE	26	60	3.15569E+12	6.31581E-31	6.31568E-31	6.31560E-31	6.31538E-31	6.31494E-31	6.31450E-31	6.31319E-31	6.31144E-31
FE	26	61	3.60001E+02	7.88783E-25	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	57	2.34838E+07	2.49965E-21	1.12863E-22	2.37775E-23	2.25231E-25	2.02943E-29	1.82860E-33	1.33770E-45	8.81749E-62
CO	27	58	6.13405E+06	6.83227E-19	1.54337E-23	1.23333E-26	2.22636E-34	7.25459E-50	2.36391E-65	0.00000E+00	0.00000E+00
CO	27	60	1.65983E+08	6.07137E-16	4.08872E-16	3.14138E-16	1.62538E-16	4.35132E-17	1.16490E-17	2.23505E-19	1.14804E-21
CO	27	61	5.94007E+03	6.77432E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CO	27	62	8.34012E+02	3.61193E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00

CO	27	60	2.99999E-01	2.15822E-24	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NI	28	59	2.52053E+12	1.60142E-21	1.60138E-21	1.60135E-21	1.60128E-21	1.60114E-21	1.60100E-21	1.60059E-21	1.60003E-21
NI	28	63	2.90020E+09	2.56620E-19	2.50879E-19	2.47123E-19	2.37977E-19	2.20688E-19	2.04650E-19	1.63214E-19	1.20708E-19
NI	28	65	9.21738E+03	2.37611E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CU	29	66	4.62098E+04	4.13370E-16	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RB	37	86	1.60972E+06	4.40639E-22	8.69750E-40	1.36899E-51	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	87	1.00799E+04	2.43677E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	89	4.50096E+06	1.36270E-20	6.34680E-27	3.81364E-31	1.04724E-41	8.35817E-63	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	90	8.06377E+08	3.56565E-25	3.31120E-25	3.15174E-25	2.78589E-25	2.17665E-25	1.70064E-25	8.11122E-26	3.02263E-26
SR	38	91	3.48315E+04	3.25450E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	92	9.75604E+03	1.57597E-25	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SR	38	93	4.50095E+02	8.06329E-24	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	89	1.56990E+01	3.05913E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	90	2.30281E+05	3.90956E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	91	5.09667E+06	3.61799E-21	9.26210E-27	1.73331E-30	8.30395E-40	1.90585E-58	4.37414E-77	0.00000E+00	0.00000E+00
Y	39	92	1.27440E+04	1.14754E-21	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	94	1.12200E+03	2.84057E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
Y	39	96	9.80406E+00	2.38057E-24	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	88	7.20602E+06	5.44896E-24	6.04475E-28	1.39558E-30	3.57443E-37	2.34470E-50	1.53804E-63	0.00000E+00	0.00000E+00
ZR	40	89	2.82249E+05	6.20529E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
ZR	40	93	4.74758E+13	8.89348E-24	8.89347E-24	8.89346E-24	8.89344E-24	8.89340E-24	8.89336E-24	8.89323E-24	8.89307E-24
ZR	40	95	5.63534E+06	5.39902E-20	4.73219E-25	2.01171E-28	7.49576E-37	1.04065E-53	1.44674E-70	0.00000E+00	0.00000E+00
ZR	40	97	6.04840E+04	7.98843E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	91	2.20888E+10	2.37409E-25	2.36705E-25	2.36237E-25	2.35070E-25	2.32754E-25	2.30460E-25	2.23714E-25	2.15026E-25
NB	41	92	8.80746E+05	9.41764E-21	4.12815E-53	1.10567E-74	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	94	6.30134E+11	1.28708E-21	1.28694E-21	1.28685E-21	1.28663E-21	1.28618E-21	1.28574E-21	1.28440E-21	1.28267E-21
NB	41	95	3.02684E+06	1.08004E-21	4.14863E-31	2.19220E-37	4.44980E-53	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	96	8.28132E+04	2.16981E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	97	4.33217E+03	1.98724E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	98	3.06025E+03	6.32074E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
NB	41	100	3.09994E+00	4.43306E-24	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	93	2.84077E+11	1.27026E-23	1.26997E-23	1.26977E-23	1.26928E-23	1.26831E-23	1.26733E-23	1.26441E-23	1.26052E-23
MO	42	99	2.41515E+05	1.41982E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
MO	42	101	8.76292E+02	6.79001E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	104	2.61565E+02	4.89498E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
RH	45	106	7.84813E+03	2.50247E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PD	46	107	2.05134E+14	9.63666E-30	9.63666E-30	9.63666E-30	9.63665E-30	9.63664E-30	9.63663E-30	9.63660E-30	9.63656E-30
PD	46	109	4.83704E+04	2.52413E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	106	7.34422E+05	1.12648E-22	1.76428E-61	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
AG	47	108	4.10389E+09	1.23241E-19	1.21286E-19	1.20000E-19	1.16844E-19	1.10779E-19	1.05029E-19	8.95085E-20	7.23221E-20
AG	47	110	2.15826E+07	2.11235E-17	1.00992E-18	1.33036E-19	8.37872E-22	3.32344E-26	1.31824E-30	8.22672E-44	2.03638E-61
CD	48	109	3.99508E+07	2.07447E-23	4.01373E-24	1.34268E-24	8.69043E-26	3.64060E-28	1.52513E-30	1.12125E-37	3.45328E-47
CD	48	111	2.92221E+03	5.27629E-24	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	115	1.92541E+05	1.68048E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	117	1.22399E+04	5.11833E-24	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CD	48	119	5.97541E+02	2.87141E-27	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	111	2.42444E+05	7.85107E-25	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	112	1.25400E+03	4.19588E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	114	4.27869E+06	7.43450E-24	1.62360E-30	5.88803E-35	4.66332E-46	2.92495E-68	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	115	1.61497E+04	8.38382E-24	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	116	1.40998E+01	3.90186E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	117	6.95931E+03	5.42596E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	118	2.63955E+02	2.04524E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	119	1.26027E+02	2.04949E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	120	4.60093E+01	4.57983E-24	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
IN	49	122	1.00998E+01	6.27315E-26	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	113	9.94473E+06	1.73611E-20	2.36404E-23	2.90592E-25	4.86407E-30	1.36273E-39	3.81792E-49	8.39596E-78	0.00000E+00
SN	50	121	9.72156E+04	7.88066E-19	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
SN	50	123	1.07967E+07	1.15664E-19	2.65193E-22	4.61108E-24	1.83830E-28	2.92159E-37	4.64325E-46	1.86396E-72	0.00000E+00
SN	50	125	8.12599E+05	1.40899E-18	1.19418E-53	4.96415E-77	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
I	53	130	4.44981E+04	1.67132E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
XE	54	133	4.56010E+05	8.57638E-22	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	132	5.50990E+05	8.92969E-21	9.27196E-72	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
CS	55	134	6.47801E+07	6.16303E-17	2.23797E-17	1.13910E-17	2.10537E-18	7.19222E-20	2.45695E-21	9.79498E-26	1.33395E-31
EU	63	152	4.17559E+08	5.28043E-16	4.51250E-16	4.06364E-16	3.12724E-16	1.85296E-16	1.09685E-16	2.27836E-17	2.80280E-18
EU	63	154	2.69812E+08	5.31498E-17	4.16749E-17	3.54370E-17	2.36272E-17	1.05033E-17	4.66912E-18	4.10174E-19	1.60142E-20
LU	71	174	1.22687E+07	3.70934E-27	1.76349E-29	4.98607E-31	6.70230E-35	1.21102E-42	2.18811E-50	1.29073E-73	0.00000E+00
LU	71	177	1.58242E+07	1.69657E-24	1.17239E-26	6.21008E-28	2.27900E-31	3.06134E-38	4.11222E-45	9.96739E-66	0.00000E+00
HF	72	173	8.49653E+04	4.16079E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	175	6.04840E+06	3.27058E-18	6.38509E-23	4.59704E-26	6.44805E-34	1.26811E-49	2.49395E-65	0.00000E+00	0.00000E+00
HF	72	178	9.78261E+08	1.53100E-25	1.45167E-25	1.36905E-25	1.22424E-25	9.78942E-26	7.82796E-26	4.00241E-26	1.63339E-26
HF	72	179	1.89584E+10	7.24854E-27	7.22347E-27	7.20680E-27	7.16530E-27	7.08302E-27	7.00168E-27	6.76322E-27	6.45787E-27
HF	72	180	1.98723E+04	1.56224E-24	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	181	3.66357E+06	2.38300E-17	3.96279E-25	2.58179E-30	2.79724E-43	3.28329E-69	0.00000E+00	0.00000E+00	0.00000E+00
HF	72	182	2.84077E+14	7.71766E-32	7.71766E-32	7.71766E-32	7.71765E-32	7.71765E-32	7.71764E-32	7.71762E-32	7.71760E-32
TA	73	180	2.93458E+04	1.93045E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TA	73	182	9.89362E+06	3.92496E-17	5.16722E-20	6.20684E-22	9.81557E-27	2.45461E-36	6.13832E-46	9.59967E-75	0.00000E+00
W	74	181	1.20968E+07	1.44281E-20	6.35725E-23	1.78861E-24	2.02341E-28	2.83760E-36	3.97942E-44	1.09755E-67	0.00000E+00
W	74	185	6.47601E+06	1.80155E-18	7.18205E-23	8.38139E-26	3.89941E-33	8.43975E-48	1.82670E-62	0.00000E+00	0.00000E+00
W	74	187	8.59904E+04	3.53450E-17	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	203	4.02525E+06	5.43443E-23	4.51062E-30	8.60601E-35	1.36353E-46	3.42098E-70	0.00000E+00	0.00000E+00	0.00000E+00
HG	80	205	3.11947E+02	4.25555E-23	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	204	1.19282E+08	5.69477E-25	3.16975E-25	2.19636E-25	6.78083E-26	1.40321E-26	2.24237E-27	9.15090E-30	5.96768E-33
TL	81	206	2.52054E+02	9.79014E-24	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
TL	81	207	2.86188E+02	7.94006E-24	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	203	1.86782E+05	2.16530E-20	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
PB	82	205	4.76398E+14	9.86746E-26	9.86746E-26	9.86746E-26	9.86746E-26	9.86746E-26	9.86745E-26	9.86744E-26	9.86742E-26
PB	82	207	7.95989E-01	2.16723E-18	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
			TOTAL (CURIES/CC)	2.93762E-13	1.29527E-14	7.90879E-15	2.55203E-15	5.16318E-16	2.26370E-16	4.94571E-17	1.51677E-17
			TOTAL (CURIES)	[illegible]84273E-06	1.25150E-07	7.65333E-08	2.46960E-08	4.99641E-09	2.19058E-09	4.78596E-10	1.46777E-10

Attachments

EE-DEC-0010

REV B

Fort St. Vrain Activation Analysis

Attachment 1
EE-DEC-0010

Activation Analysis TSO Data Sets/Notes

Activation Analysis - R5

TSO Data Sets / Notes

ANISN - Neutron Flux Calculation - **R1
T8284

	Input	Output
Radial	ANISN.DATA(R[illegible]LR1)	REBATE.DATA(RBTRADR1)
Axial Up	ANISN.DATA(AXUPR1)	REBATE.DATA(RBTUPR1)
Axial Down	ANISN.DATA(DOWNR1)	REBATE.DATA(RBTDWNR1)

** The ANISN runs for the neutron flux were not redone for Rev. 5.

REBATE - Activation Calculations - R5
T8184

RADIAL	Input	Output
	REBATE.DATAR5( )	REBATE.L133R5( )
All Components (Large Reflector to Concrete)	TOTGRDR5 **TOTRDR5C	TOTGRDR5 **TOTRDR5C
Top of Core Barrel	RCBTOPR5	RCBTOPR5
AXIAL UP		
All Components (Top Non CR MCB to Concrete)	TOTGUPR5	TOTGUPR5
Top CR MCB	TOPREFR5	TOPREFR5
RCD	UPRCDR5	UPRCDR5
Upper Orifice Valve	UPOVR5	UPOVR5
AXIAL DOWN		
All Components (CSB to CSF)	TOTGDNR5 **TOTDNR5C	TOTGDNR5 **TOTDNR5C
Hastelloy Cans : Metal Only Graphite Only	 HASTXMR5 HASTXGR5	 HASTXMR5 HASTXGR5

** TOTRDR5C and TOTDNR5C were added to correct impurity levels in HLM graphite used in the large side reflectors and core core support blocks.

SRCEDOS1 - Gamma Source Calculations - R5
T8184

RADIAL	Input	Output
All Components :		
5 years	REBATE.L133R5(TOTGRDR5)	ANISN.DATAR5(TRAD5R5)
30 years	REBATE.L133R5(TOTGRDR5)	ANISN.DATAR5(TRAD30R5)
60 years	REBATE.L133R5(TOTGRDR5)	ANISN.DATAR5(TRAD60R5)
100 years	REBATE.L133R5(TOTGRDR5)	ANISN.DATAR5(TRAD00R5)

AXIAL UP		
All Components :		
5 years	REBATE.L133R5(TOTGUPR5)	ANISN.DATAR5(TUP5R5)
30 years	REBATE.L133R5(TOTGUPR5)	ANISN.DATAR5(TUP30R5)
60 years	REBATE.L133R5(TOTGUPR5)	ANISN.DATAR5(TUP60R5)
100 years	REBATE.L133R5(TOTGUPR5)	ANISN.DATAR5(TUP00R5)

AXIAL DOWN		
All Components :		
5 years	REBATE.L133R5(TOTGDNR5)	ANISN.DATAR5(TDWN5R5)
30 years	REBATE.L133R5(TOTGDNR5)	ANISN.DATAR5(TDWN30R5)
60 years	REBATE.L133R5(TOTGDNR5)	ANISN.DATAR5(TDWN60R5)
100 years	REBATE.L133R5(TOTGDNR5)	ANISN.DATAR5(TDWN00R5)

ANISN - Gamma Flux Calculations - R5

SRCEDOS2 - Dose Rate Calculations - R5

T8184

RADIAL	ANISN Input ANISN.DATAR5( )	ANISN Output / SRCEDOS2 Input SDOS2.DATAR5( )	SRCEDOS2 Output REBATE.L133R5( )
All Components :			
5 years	RALL5R5	RALL5R5	All outputs listed in member R5DOS2.
30 years	RALL30R5	RALL30R5	
60 years	RALL60R5	RALL60R5	
100 years	RALL00R5	RALL00R5	
Liner->Concrete (5 yrs)	RLIN5R5	RLIN5R5	
Liner->Concrete (60 yrs)	RLIN60R5	RLIN60R5	
Spacers->Concrete (5 yrs)	RNLG5R5	RNLG5R5	
Spacers->Concrete (60 yrs)	RNLG60R5	RNLG60R5	
Core Barrel->Concrete (5 yrs)	RCB5R5	RCB5R5	
Core Barrel->Concrete (60 yrs)	RCB60R5	RCB60R5	
Concrete Only (5 yrs)	RCON5R5	RCON5R5	
Concrete Only (60 yrs)	RCON60R5	RCON60R5	
Concrete (5 yrs) (Minus 11 int.)	R55M11	R55M11	
Concrete (5 yrs) (Minus 12 int.)	R55M12	R55M12	
Concrete (60 yrs) (Minus 3 int.)	R560M3	R560M3	
Concrete (60 yrs) (Minus 4 int.)	R560M4	R560M4	
Concrete (60 yrs) (Minus 5 int.)	R560M5	R560M5	

ANISN - Gamma Flux Calculations - R5

SRCEDOS2 - Dose Rate Calculations - R5

T8184

	ANISN Input	ANISN Output / SRCEDOS2 Input	SRCEDOS2 Output
AXIAL UP	ANISN.DATAR5( )	SDOS2.DATAR5( )	REBATE.L133R5( )
All Components :			
5 years	UALL5R5	UALL5R5	All outputs listed in member R5DOS2.
30 years	UALL30R5	UALL30R5	
60 years	UALL60R5	UALL60R5	
100 years	UALL00R5	UALL00R5	
Liner->Concrete (5 yrs)	ULIN5R5	ULIN5R5	
Liner->Concrete (60 yrs)	ULIN60R5	ULIN60R5	
Concrete Only (5 yrs)	UCON5R5	UCON5R5	
Concrete Only (60 yrs)	UCON60R5	UCON60R5	
Concrete (5 yrs) (Minus 17 int.)	U5R5M17	U5R5M17	
Concrete (5 yrs) (Minus 18 int.)	U5R5M18	U5R5M18	
Concrete (60 yrs) (Minus 8 int.)	U60R5M8	U60R5M8	
Concrete (60 yrs) (Minus 9 int.)	U60R5M9	U60R5M9	

ANISN - Gamma Flux Calculations - R5

SRCEDOS2 - Dose Rate Calculations - R5

T8184

AXIAL DOWN	ANISN Input ANISN.DATAR5( )	ANISN Output / SRCEDOS2 Input SDOS2.DATAR5( )	SRCEDOS2 Output REBATE.L133R5( )
All Components :			
5 years	DALL5R5	DALL5R5	All outputs listed in member R5DOS2.
30 years	DALL30R5	DALL30R5	
60 years	DALL60R5	DALL60R5	
100 years	DALL00R5	DALL00R5	
Liner->Concrete (5 yrs)	DLIN5R5	DLIN5R5	
Liner->Concrete (60 yrs)	DLIN60R5	DLIN60R5	
Concrete Only (5 yrs)	DCON5R5	DCON5R5	
Concrete Only (60 yrs)	DCON60R5	DCON60R5	
Concrete (5 yrs) (Minus 10 int.)	D5R5M10	D5R5M10	
Concrete (5 yrs) (Minus 11 int.)	D5R5M11	D5R5M11	
Concrete (60 yrs) (Minus 2 int.)	D60R5M2	D60R5M2	
Concrete (60 yrs) (Minus 3 int.)	D60R5M3	D60R5M3	
Concrete (60 yrs) (Minus 4 int.)	D60R5M4	L60R5M4	

Activation Analysis Notes
(From REBATE runs through Dose Rate Calcs)

Code	Function	JCL	Notes
REBATE	Computes Activation for input to SRCEDOS1	FT02-REBATE cross-sections	-Usually done for several time-periods
		FT06-Output	
		FT01-ANISN neutron flux input	-Sometimes has underflows
		FT05-REBATE input deck	
T1368.WALKER.CNTL(REBATE)		SYSUT1 - Decay Library	
SRCEDOS1	Calculates source for input to ANISN	FT01 - input (REBATE output FT06)	
T1368.WALKER.CNTL(SRCEDOS1)		FT06 - output FT0s-'SOURCE'; Total Intervals;TIME	
ANISN	Calculate flux input to SREEDOS2	FT04 - 8 cross-sections FT05 - Input Deck FT07 - Output Flux	-FT05 deck is a hand from SRCEDOS1 output-edit 17** array and 8$$array
			-Ends on "end of fi error
			-Be sure to edit out deck to change all ' to "*"'s
T1368.WALKER.CNTL.(ANISNGAM)			
SRCEDOS2	Calculates Dose Rate	FT01 - Flux input (FT07 from ANISN)	-Get normalization factor from ANISN FT03
		FT06 - Output	-Will end on "End of Record" error if ou is written to 80 LR file
		FT05 - 'DOSE'; Total Intervals; Normalization Factor	
T1368.WALKER.CNTL(SRCEDOS2)			
SITEREB	Activation of Components (5,→100 yrs Edit)	FT01 - Input REBATE file FT02 - Decay Library FT06 - Output	
SITEREB2	Activation of Components (3 → 60 yrs Edit)	FT05 - Volume; Title/Comments; Desired Intervals	
T1368.WALKER.CNTL(SITEREB/SITEREB2)			

<u>POSTREB</u>	Activation of Components	FT01 - Input REBATE file FT02 - Decay Library FT03 - Output

T1368.WALKER.CNTL(POSTREB)

Attachment 2
EE-DEC-0010

Component Material Compositions and Volume Calculations

Attachment 2
EE-DEC-0010

Public Service

FORT ST. VRAIN NUCLEAR GENERATING STATION
PUBLIC SERVICE COMPANY OF COLORADO
CALCULATION WORKSHEET

CALCULATION FOR			CALCULATION NUMBER
Index for Component Composition / Volume Calcs			
PREPARED BY	DATE		
REVIEWED BY	DATE	CALC. REV.	PAGE OF

Component	Calc #
1. Boronated Rods in Spacer Blocks	C-01
2. Concrete	C-02
3. Core Barrel	C-03
4. Core Barrel Key *	C-04
5. Core Support Blocks, Posts	C-05
6. Hastelloy X tubes in bottom reflectors	C-06
7. Kaowool/Cover Plates - CSF	C-07
8. Kaowool/Cover Plates - Radial	C-08
9. Kaowool/Cover Plates - Top Head	C-09
10. Large Side Reflector	C-10
11. Metal Clad Block - CR element	C-11
12. Metal Clad Block - NCR element	C-12
13. Metal Jacket - Large Side Reflector	C-13
14. Orifice Valve - Lower Assembly	C-14
15. PCRV Liner	C-15
16. Reflector Key (Core Barrel to Lg. Ref)	C-16
17. Region Constraint Device	C-17
18. Silica Blocks	C-18
19. Steam generator *	C-19

* Not modelled

Form (B) 344-24-4309