Appendix E

Evaluation of Seismic Conditions Near the Site

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

December 18, 1998

Mr. John H. Ellis, President
Sequoyah Fuels Corporation
P.0. Box 610
Gore, Oklahoma 74435

SUBJECT: TRANSMITTAL OF NRC'S RESPONSE TO EVALUATION OF SEISMIC CONDITIONS NEAR YOUR SITE

Dear Mr. Ellis:

The U.S. Nuclear Regulatory Commission has completed its review of the information related to seismic conditions in the vicinity of your site. This review demonstrated that none of the known faults near your site are capable faults, as defined in Section III of Appendix A to Title 10 Code of Federal Regulations Part 100. A copy of the review is included for your information.

If you have any questions on this matter, please contact Jim Shepherd at 301-415-6712.

Sincerely,

John W. N. Hickey, Chief
Low-Level Waste and Decommissioning
Projects Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards

Docket 40-8027
License SUB-1010

Enclosure: As stated

cc: SFC distribution list

cc: Alvin Gutterman, Esq.
Craig Harlin
JoKay Dowell
Pat Gwin
Michael Broderick
Michael Hebert, P.E.
Dr. Loren Mason
Kathy Peter
Charles Scott
Merritt Youngdeer
Troy Poteete
President, S.A.F.E.S.T
Jeannine Hale, Esq.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

December 03, 1998

NOTE TO: James Shepherd, Project Manager
Sequoyah Fuels Corporation
LLDP/DWM/NMSS

FROM: Philip S. Justus, Senior Geologist
ENGB/DWM/NMSS

SUBJECT: **SEQUOYAH FUELS CORPORATION (SFC) SITE EVALUATION OF FAULTS AND FAULTING: INPUT TO SAFETY EVALUATION REPORT**

BACKGROUND AND CONCLUSIONS:

This report documents my evaluation of the faults that have been mapped, assumed to be present, or otherwise mentioned in reports, letters, and maps concerning faults in and around the SFC site near Gore, Oklahoma. In particular, this report is in response to materials submitted by C.H. Harlin of SFC to you dated April 8, 1998, with the subject, "License SUB-1010; Docket No. 40-8027 - Seismic Conditions Near the Sequoyah Facility." Based on the information that I have reviewed and the field observations that I made, I do not consider that the known faults are capable faults according to the definition of 10 CFR Part 100, Appendix A. Therefore, these faults need not be considered as seismic sources for the purposes of determining the seismic design basis. This note may be used as input to a Safety Evaluation Report. The bases for my conclusions are described in the sections below.

At your request, I performed a preliminary evaluation of SFC submittals for the purposes of determining whether or not faults that were indicated to occur on or near the site are capable faults, and whether or not other geologic hazards might exist and would need to be considered in design. The information available to me was insufficient to make definitive findings on the above issues. A request for additional information from SFC, along with the reasons for requesting each bit of information, was prepared and sent to SFC.

SFC responses were evaluated and found to be inadequate for reaching regulatory conclusions. Constructive comments and guidance intended to lead SFC to develop supporting bases for its conclusions on each issue were prepared, discussed by teleconference, and sent to SFC. A site visit for NRC staff was arranged and made (participants included Dr. Ibrahim and myself). In addition, Dr. Ibrahim and I visited the offices of the State Geologist, the State Seismologist, interviewed various geoscientists, obtained written reports and discussed several issues regarding the site with them.

ENCLOSURE

SFC's April 8, 1998, report and additional reports were reviewed (e.g., relevant parts of Black Fox and Arkansas Nuclear One reactor safety evaluation reports). The combination of the above materials and results of investigations provided a sufficient basis for determining that none of the known faults near the SFC site are capable faults.

FAULTS ON AND AROUND SFC SITE:

The faults on and around the SFC site that are candidates for capable faults include: (1) faults associated with the South Fault of Warner Uplift (near dam a few miles upriver from Webbers Falls, OK); (2) Carlile School Fault and an E-W splay from the Carlile Fault (=Carlile School Fault) near the southern boundary of the SFC property; and (3) Marble City Fault and its splay. These are all shown in the SFC Site Characterization Report (SCR) of 2/2/96, Figure 9; Attachment 1.

The Carlile Fault, the closest fault to the site, is shown to intersect the Marble City Fault (MCF) on one map, but not on another. Both maps were submitted by SFC. Also, a cross section showed that parts of the South Fault of Warner Uplift (SFWU) and the Carlile fault (CF) were a few thousand feet deep and did not penetrate the granite basement rocks (SCR, Figure 11, attachment 2). The fault lengths, fault-zone widths, depth, and connectivity of the faults on the SFC maps and cross sections are not well constrained, and vary from map to map. This is due to a dearth of data that may only be derived from better exposures, borehole penetrations and geophysical surveys. These and other discrepancies have been satisfactorily explained in the April 8, 1998, letter.

Other map sources of fault information submitted by SFC or consulted by me include the tectonic map of OK (Arbenz, 1956), Hydrologic Atlas map HA-1 (Marcher, 1969), geologic map of Webber Falls area (Chenoweth, 1983), and trace map of the Carlile Fault (Van Arsdale, 1998, in subject document). Of the faults on these maps, the Chenoweth map and others submitted by SFC based on its own or its consultants' investigations are most relevant to the capable fault issue. The SFC-sponsored maps have some bases to support them, whereas, the smaller scale state maps do not appear to have bases traceable to observations of the geology made in the vicinity of the SFC site. Therefore, I am relying much more heavily on the observations and interpretations of local geology and local features of faults in the SFC reports and maps than on abstractions of them made from the state reports and maps.

ASSESSMENT OF SELECTED FAULTS DISCUSSED IN SFC'S "REGIONAL GEOLOGY RELATING TO SEISMIC CONDITIONS AT THE SEQUOYAH FACILITY" SUBMITTED APRIL 8, 1998, AND IN OTHER DOCUMENTS:

<u>I. Marble City Fault (MCF).</u> The trace of the MCF near the SFC site has not been located consistently by SFC (e.g., Chenoweth, 1983; SCR, 1996; Van Arsdale, 1998). For example, the location of the MCF with regard to the Carlile Fault (CF) is near the northern terminus of the CF and the MCF does not intersect the CF at the surface (Chenoweth, Attachment 3; and Van

Arsdale, Attachment 4 show the CF to be 1 mile long), whereas the location of the MCF is near the southern terminus of the CF in the SCR (the CF is shown to be 4 mi long; Attachment 1).

The MCF is not a capable fault (10 CFR Part 100, Appendix A) because it does not appear to meet any of the criteria for being a capable fault (i.e., (i) there was no single displacement on it in the last 35,000 years or two displacements in the last 500,000 years (e.g., Black Fox and Arkansas Nuclear One SERs); (ii) there is no macroseismicity associated with it (e.g., Earthquake Map of OK, 1995, and updates and interviews with Kenneth Luza); and (iii) it is not structurally related to a known capable fault (e.g., Black Fox and Arkansas Nuclear One SERs). Therefore, the location of the MCF and its relationship to other faults near the SFC site do not need to be pinpointed for the purpose of ascertaining seismic design basis at the site.

II. South Fault of Warner Uplift (SFWU). The SFWU is tectonically similar to the MCF, in that it is one of a series of northeast-trending normal faults that are arrayed on the southwestern flank of the Ozark dome. The SFWU is seismotectonically similar to the MCF in that it does not meet any of the criteria for capable faults (e.g., reasons similar to that for MCF in I, above). Therefore, I do not consider the SFWU to be a capable fault.

III. Carlile Fault, or Carlile School Fault (CF). The trace of the CF is marked by a rubbly vegetated ridge up to about 12 feet in relief and up to one mile long. The fault has a northeast strike, displacement of about 100 feet down to the southeast and a moderate dip to the southeast (Attachments 1, 2). Van Arsdale (attachment to the subject report) indicates that the fault zone is characterized by rock strata with dips up to 17 degrees southeast which interrupt the regional southwestern dips of about 5 degrees. The fault does not meet any of the criteria for a capable fault. On the criterion of youthful displacement: the absence of disruption of Quaternary and Holocene sediments that veneer the fault zone (Van Arsdale, ibid; and SCR, Figure 10) and the lack of steep scarps militates against displacements in the Late Quaternary Period. On the criterion of macroseismicity: there is no definitive relationship of macroseismicity to the CF (e.g., Earthquake Map of OK, 1995). On the criterion of structural relationship to a capable fault: the CF does not appear to be connected to the MCF (Chenoweth; and Van Arsdale, ibid.); and the MCF is not a capable fault (e.g., Black Fox and Arkansas Nuclear One reports). Therefore, based on available information, there is no evidence that the CF is a capable fault. The CF need not be investigated in further detail for the purpose of ascertaining the seismic design basis.

SFC's explanation for the E-W splay of the CF that appears in attachment 1 (dashed line) is reasonable and acceptable (April 8, 1998 letter). Thus, the E-W splay, the only fault that has been suggested to occur within the site boundary, has little or no basis in fact, and need not be considered in establishing the seismic design basis.

The faults mentioned in I, II, and III, above, in particular, the CF and the E-W splay of the CF, may need to be considered for purposes other than as potential contributors to seismic design

basis. For example, if the faults or features they represent have a significant effect on groundwater flow, they may need to be characterized for purposes of understanding or constraining attributes of groundwater flow and contaminant transport.

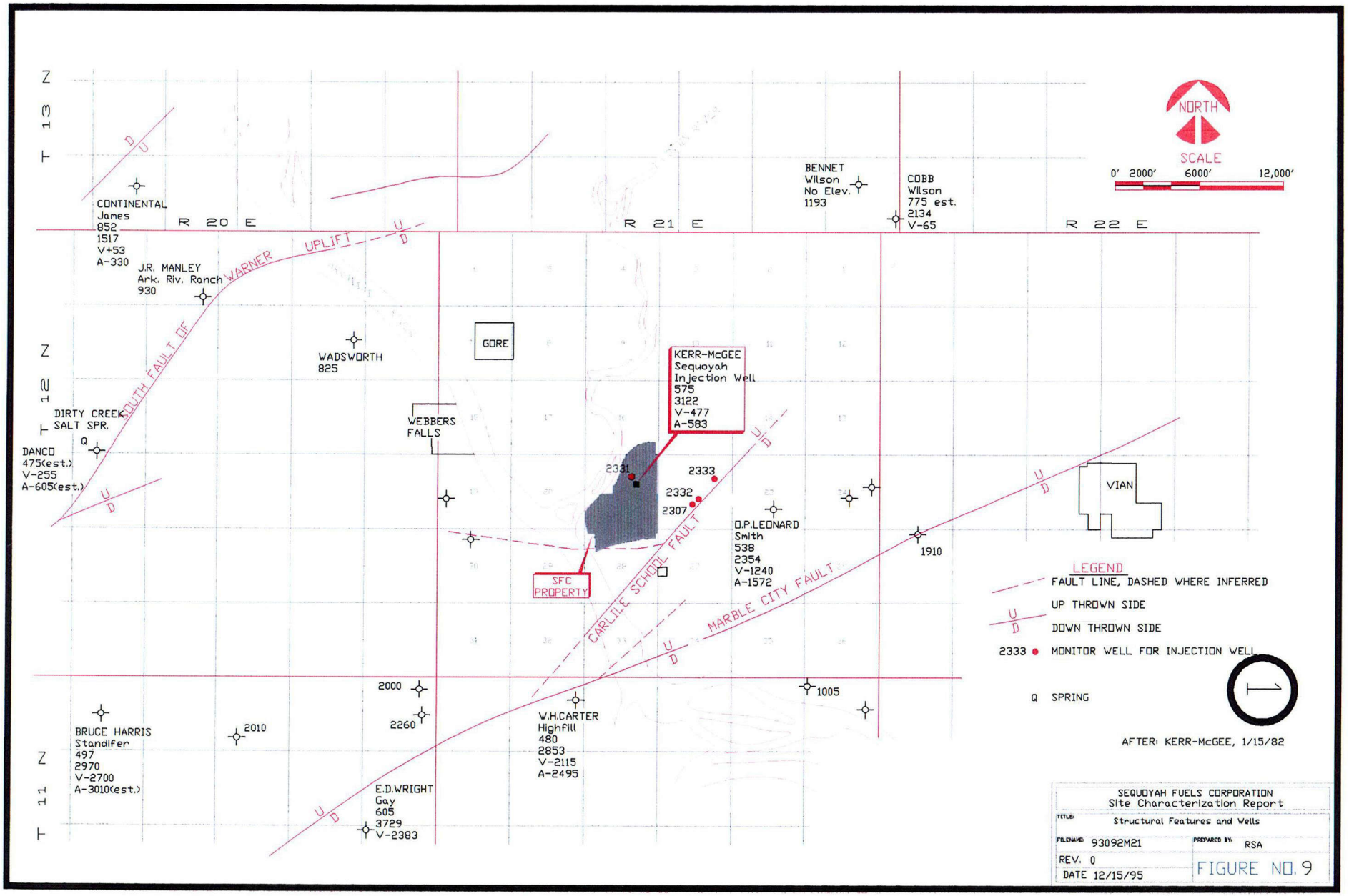
CONCLUSION REGARDING CAPABLE FAULTS IN THE SFC SITE VICINITY:

As described above, based on the results of reviews of faults and fault investigations relevant to the identification and investigation of faults near the SFC site that may be capable faults according to the definition of 10 CFR Part 100, Appendix A, the staff finds no evidence to support a conclusion that such capable faults exist on or near the SFC site. Specifically, the CF, MCF, and SFWU described above are not considered to be capable faults.

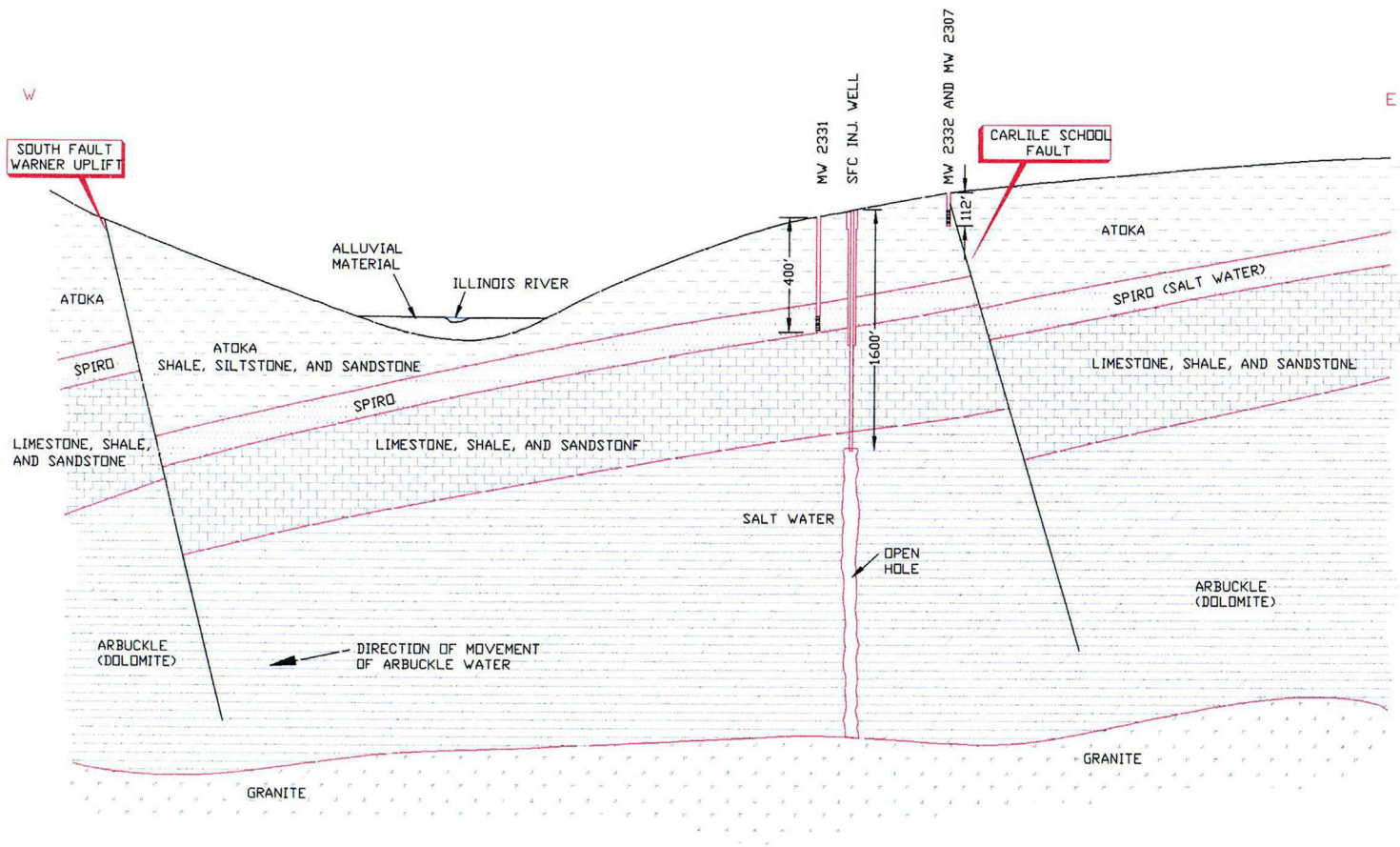
cc: Bill Reamer
David Brooks
Bakr Ibrahim

Attachments:

1. Structural Features and Wells, Fig. 9, SFC Site Characterization Report, 2/2/96
2. Regional Geological Cross Section, Fig. 11, ibid.
3. Portion of Geologic Map of Webber(sic) Falls Area, by P.A. Chenoweth, July 1983
4. Location of Carlile fault zone, Fig. 1, Paleoseismological Analysis of the Carlile Fault in Sequoyah County, OK, by R. Van Arsdale, undated attachment to the subject report.

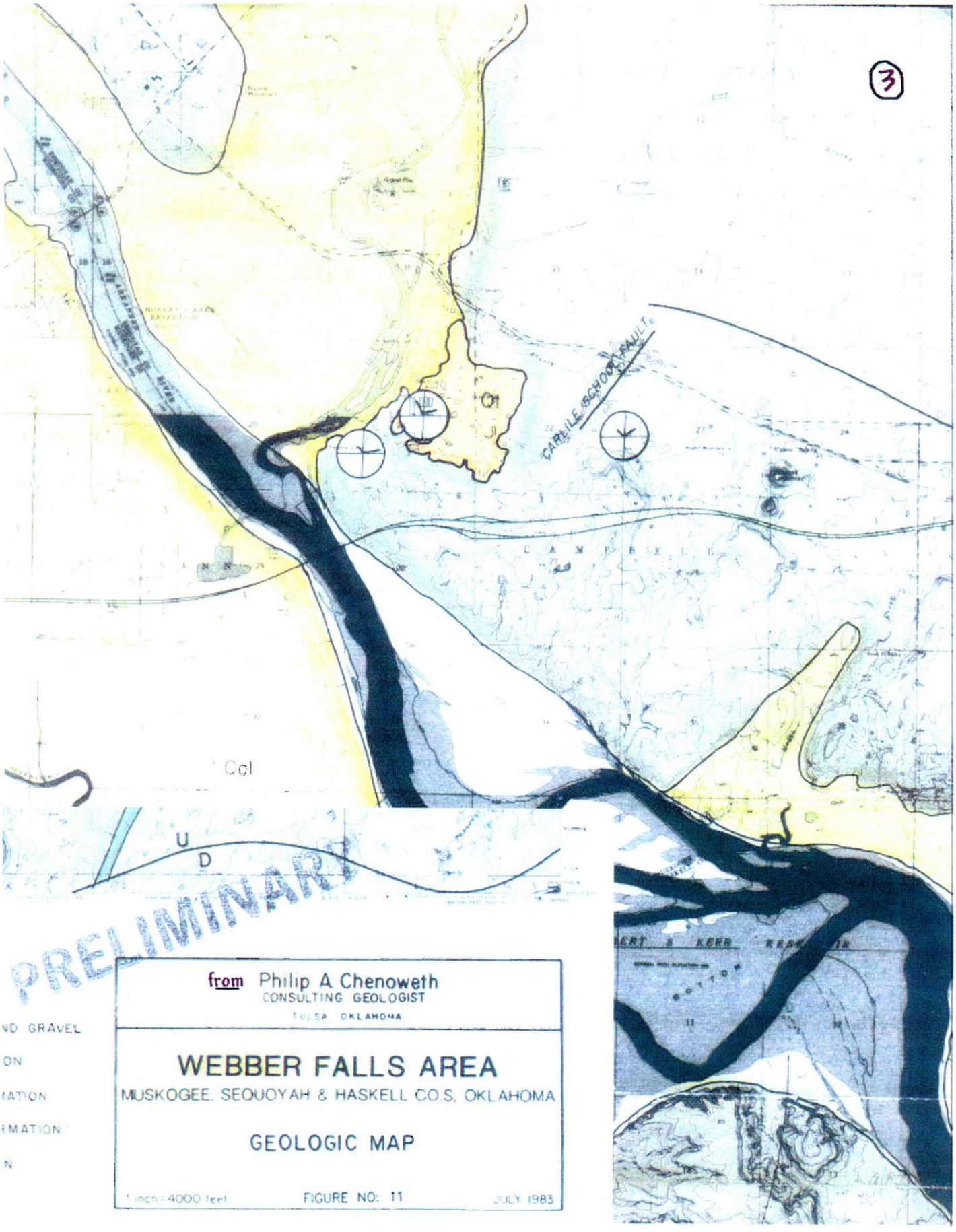

T 13 N
T 12 N
T 11 N
R 20 E
R 21 E
R 22 E
NORTH
SCALE
0' 2000' 6000' 12,000'
CONTINENTAL
James
852
1517
V+53
A-330
J.R. MANLEY
Ark. Riv. Ranch
930
BENNET
Wilson
No Elev.
1193
COBB
Wilson
775 est.
2134
V-65
WARNER UPLIFT
SOUTH FAULT OF
WADSWORTH
825
GORE
KERR-McGEE
Sequoyah
Injection Well
575
3122
V-477
A-583
DIRTY CREEK
SALT SPR.
Q
DANCO
475(est.)
V-255
A-605(est.)
WEBBERS
FALLS
2331
2333
2332
2307
SFC
PROPERTY
CARLILE SCHOOL FAULT
MARBLE CITY FAULT
D.P.LEONARD
Smith
538
2354
V-1240
A-1572
VIAN
1910
2000
2260
2010
1005
BRUCE HARRIS
Standifer
497
2970
V-2700
A-3010(est.)
W.H.CARTER
Highfill
480
2853
V-2115
A-2495
E.D.WRIGHT
Gay
605
3729
V-2383
LEGEND
FAULT LINE, DASHED WHERE INFERRED
UP THROWN SIDE
DOWN THROWN SIDE
2333 MONITOR WELL FOR INJECTION WELL
Q SPRING
AFTER: KERR-McGEE, 1/15/82
SEQUOYAH FUELS CORPORATION
Site Characterization Report
TITLE: Structural Features and Wells
FILENAME: 93092M21
PREPARED BY: RSA
REV. 0
DATE 12/15/95
FIGURE NO. 9

C01



SEQUOYAH FUELS CORPORATION Site Characterization Report	
Geological Cross Section A-A'-A'	
93092M18	RSA
REV. 0 DATE 12/18/95	FIGURE NO. 11

C02



from Philip A Chenoweth
CONSULTING GEOLOGIST
TULSA, OKLAHOMA

WEBBER FALLS AREA

MUSKOGEE, SEQUOYAH & HASKELL CO.S, OKLAHOMA

GEOLOGIC MAP

1 inch = 4000 feet FIGURE NO: 11 JULY 1983

ND GRAVEL
ON
MATION
RMATION
N

C03

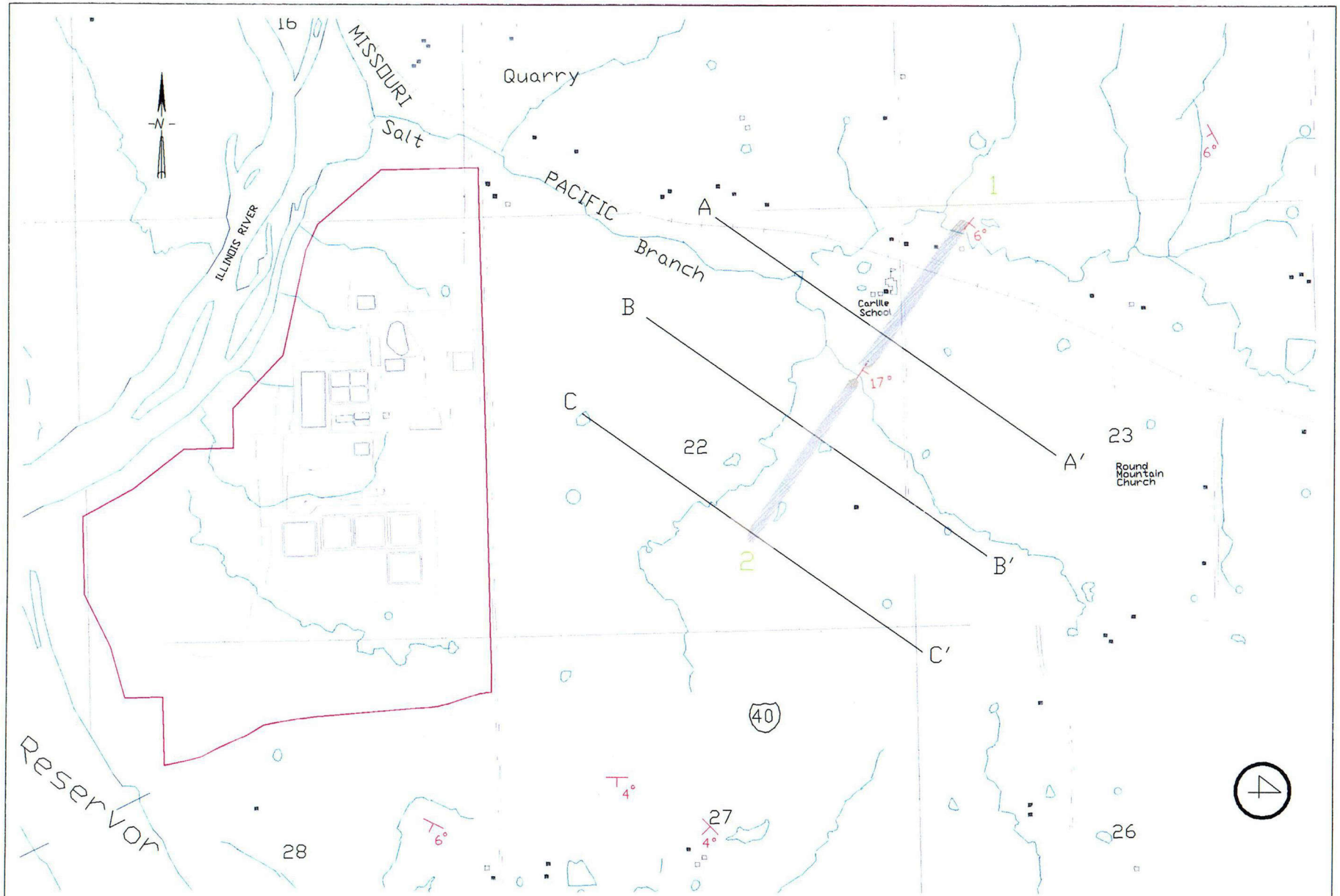


Figure 1

Lt. Gray indicates location of Carlile fault zone.

Tan indicates areas along the fault zone where streams have truncated the zone and deposited alluvial flood plains.

A - A'

Topographic profiles A-A', B-B', and C-C' are illustrated in figure 2. The photograph in figure 3 was taken at location 1 and the photograph in figure 4 was taken at location 2.

Cop

Appendix F

Sequoyah Facility Waste Evaluation & Size Reduction/Decontamination Facility Report

Sequoyah Facility
Waste Evaluation & Size Reduction / Decontamination Facility Report

submitted to

Sequoyah Fuels Corporation
November 7, 1996

B&W NESI

B&W Nuclear Environmental Services, Inc.
a McDermott company

SEQUOYAH FACILITY
WASTE EVALUATION & SIZE REDUCTION/ DECONTAMINATION FACILITY REPORT

submitted to

SEQUOYAH FUELS CORPORATION
November 7, 1996

prepared by

B&W NUCLEAR ENVIRONMENTAL SERVICES, INC.

M. S. Campagna
T. S. Cornelius
R. S. Kingsley
S. M. Schmidt
W. T. Withers

TABLE OF CONTENTS

LIST OF TABLES

TABLE

LIST OF FIGURES

FIGURE

Sequoyah Facility: Waste Evaluation &
Size Reduction/Decontamination Facility Report

1. Introduction

In 1970, Sequoyah Fuels Corporation (SFC) began operation of a facility to perform the following activities: refining uranium ore from ore concentrates and conversion to natural uranium hexafluoride (UF_6); treatment, storage and disposal of process and contaminated waste materials; and storage of natural uranium as UF_6 and UF_4. In 1987, SFC began operation of a facility to reduce depleted UF_6 to depleted uranium tetrafluoride (DUF_4).

In July 1993, SFC formally discontinued all production operations. In February and July, 1993, SFC notified the Nuclear Regulatory Commission (NRC) of its intent to terminate all licensed production of UF_6 and DUF_4. Also in February 1993, SFC submitted a Preliminary Plan for Completion of Decommissioning of the Facility.

Between July 1993 and 1995, SFC emptied the process systems of process material and flushed the systems with nitrogen. Bulk chemicals and some source material were removed from the site. General site housekeeping was performed to consolidate material ready for disposal.

SFC is preparing an Engineering Investigative Study to support a proposed on-site disposal cell for placement of process equipment and pipe; structural and architectural materials; and concrete and asphalt. This report addresses waste volumes, waste types, and quantity of source term to support cell design and pathway analysis. It also addresses facility designs for volume reduction and decontamination operations.

Areas of primary focus for this report are:

- Main Process Building
- Solvent Extraction Building (SX)
- Depleted Uranium Tetrafluoride Building (DUF4)
- General Site (Yellowcake Pad, Cylinder Storage Pad, Pallet Storage, etc.)
- Centrifuge Building

This report makes use of varied appendices to document and elaborate on detailed information.

2. Scope

The scope of this study comprises two principal elements. These are 1.) Waste Evaluation study and 2.) Size Reduction/Decontamination Facility Conceptual Design. The study addresses:

- Volumes of waste by type (e.g. contaminated/uncontaminated concrete, contaminated/uncontaminated size reduced metal, etc.),
- Approximate source terms for each type of waste, and
- Cost estimate for processing (volume reducing, packaging, etc.) and staging waste for placement in a disposal cell or free release as appropriate.

The physical scope of this study involves buildings, structures, equipment, tanks, miscellaneous materials/refuse, concrete, and asphalt. This study does not cover asbestos, groundwater, soils, lagoons, basins, ponds, sludges, liners, UF_6 cylinders, drummed DUF_4, or "clean-out" material stored on site.

The primary deliverables for this report are:

- Estimate of volume by material type for disposal in cell,
- Estimate of source term being disposed of in the proposed cell,
- Cost estimate for processing material for disposal in cell,
- Conceptual design/estimate for a size reduction facility, and
- Conceptual design/estimate for a size reduction and decontamination facility.

3. Summary of Results

Table 1 lists seven categories of materials with the disposal volume (size reduced volume) in the cell and associated source term. All materials are considered to be contaminated. Reference Appendices A through G and Tables 2 and 3 for detailed information.

Table 1
Volume and Source Term Summary

Material	Disposal Volume (Ft^3)	Source Term (Curies)
Architectural Materials	95500	3.46
Asphalt	13300	0.04
Concrete	500000	2.64
Equipment	209000	4.48
Miscellaneous Materials	144000	0.11
Pipe	24400	5.05
Structural Steel	37300	1.30
Total	1,023,500	17.08

The estimated cost associated with volume reducing/staging materials for the cell is $8.8M (Reference section 4.3). Facility floor plans are shown in Figures 1 and 2. The estimated facility cost for the size reduction facility is $870K (Reference section 4.4.1.2). The estimated facility cost for the size reduction and decontamination facility is $1.4M (Reference section 4.4.2.2). A crushing plant for concrete, block and asphalt has also been addressed, see Figure 3. The estimated cost for this plant is $400K (Reference section 4.4.2.4).

4. Technical Approach

4.1 Determination of Volume

Volumes of material were developed by engineering review of facility and equipment drawings for structural materials and equipment dimensions. See Appendix H for the list of drawings and references used. "Walk-downs" were performed to estimate items not readily available on drawings. Photographs and videos of the site were taken to augment available design drawings. Additional information concerning materials and dimensions of specific equipment were obtained from SFC.

A 3600 item database was developed for each piece of equipment evaluated and for structural materials. Dimensions as determined from the drawings or as estimated were applied to each line item. Surface areas and gross volumes were then calculated. Anticipated volume adjustment factors (reduction or increase) were assigned based on

previous experience of a material type or knowledge of internal structures of the equipment. Adjusted volumes were then calculated and summed by 7 material categories. These material categories with the assumptions used in determining volumes and source terms are addressed in the following paragraphs.

4.1.1 Architectural Materials

Architectural materials include building materials such as block, corrugated metal siding, fiberglass sheeting, roofing materials, transite, and poly lining for floors. Handrails, steel floors, and construction materials for trailers are also included.

Assumptions:

- Handrails and steel floor are carbon steel.
- Roof thicknesses for built-up roofs are 0.5 feet including decking.
- Overall height of DUF4 building is estimated.

4.1.2 Asphalt

The volume of asphalt was developed from drawing 110-C-1004 Rev. 4, Sequoyah Facility General Arrangement Fenced Area and review of the video.

Assumptions:

- Asphalt volumes were estimated for the site within the fenced area. Areas outside the fence were considered clean and excluded.
- Asphalt thickness is 0.5 feet.

4.1.3 Concrete

The volumes of concrete drives/pads were developed from drawing 110-C-1004 Rev. 4, Sequoyah Facility General Arrangement Fenced Area and review of the video. Concrete drives/pads were estimated for all areas within the fence; areas outside the fence were considered non-contaminated and are excluded. Concrete foundations and slabs for the DUF4, SX, and Miscellaneous Digest buildings were taken off the appropriate civil/structural drawings. Remaining slabs and foundations were approximated.

Assumptions:

- The concrete driveways around the main process building and tank have a thickness of 12 inches.

- The concrete driveway around the pallets has a thickness of 6 inches.
- Concrete slabs under miscellaneous buildings have a thickness of 12 inches.
- Foundation and pier volume for the Main Process Building were estimated.

4.1.4 Equipment

The facility equipment lists provided by SFC were the initial building blocks of the database used to calculate the volume and source term. Volumes for each piece of equipment were developed from the facility arrangement drawings provided by SFC, where possible. Walk downs, interviews with SFC employees, and dimensional data provided by SFC were used to estimate volumes for equipment not available on the drawings.

Assumptions:

- Miscellaneous tanks are carbon steel.
- Ductwork plate thickness is 0.125 inches.
- Volume calculations for complex shaped equipment, such as refrigeration units, are based on a simple geometry. Volume reduction of this equipment is a percentage of estimated air space within the geometry.
- 40% of the equipment material types (i.e. carbon steel, stainless steel, etc.) were assumed based upon process area and experience with equipment.

4.1.5 Miscellaneous Materials

Miscellaneous materials include the empty drums, insulation, paper, wood, forklifts, trucks, control panels, and miscellaneous parts. Volumes are estimated based on approximate size of each item, or approximation of area occupied.

Assumptions:

- 6 mil poly is included with Miscellaneous Material.
- Lightpoles are carbon steel, placed every 100,000 square feet of paved area, and are 25 feet tall and 1 foot in diameter.
- Tank cars are stainless steel.
- Filled tanks and boxes on Yellowcake pad are considered Miscellaneous Material.
- Pickup trucks and forklifts are included with Miscellaneous Materials.
- 950 railroad ties are under the UF_6 cylinders (8" x 7"x 36"' each).

4.1.6 Pipe

The volume of pipe was developed from the facility pipe drawings provided by SFC and during several site walk downs by B&W NESI personnel. The drawings were not updated with facility modifications/additions. The drawings for the main process building and SX were assumed to be 50% accurate, DUF4 95%. Final pipe volumes were adjusted to reflect these assumptions. See Appendix I for specific pipe volume calculations.

Volumes for electrical piping (conduit) and instrumentation piping were assumed to be a percentage in length to the overall length of pipe in each building for DUF4, SX, and Main Process.

Assumptions:

- Valves are assumed to be cylindrical in shape with height and diameter equal and are included as unknown pipe.
- Pipes are assumed to occupy their full cylindrical volume, although significant reduction in overall volume can be realized by pipe-in-pipe nesting and/or supercompaction.

4.1.7 Structural Steel

DUF4 platform structural steel, SX structural steel volumes, and the fluorine production area were obtained by performing take-off's from drawings. Structural steel for the platforms and other areas of the Main Process Building were determined by performing a take-off of a representative area and applying that number to other similar areas. DUF4 shell structural steel was based on a SX structural steel due to lack of drawings. (See Appendix I for calculations). Structural steel for other buildings was approximated from the pictures and the video.

Assumptions:

- Pipeway and pipeway support are included in structural steel.
- Structural steel volumes are calculated based on being nested in the disposal cell, not on cross sectional area.
- Pipeway special support, where not documented, is assumed to be 6" x 6" structural steel.
- Structural steel for warehouse and maintenance areas are based upon steel from F2 area. See Appendix I for calculations.

- Structural steel for the administration and production areas of the Main Process Building was estimated by performing take-offs of representative areas.
- Structural steel for the DUF4 building is based upon structural steel from SX. See Appendix I for calculations.

4.2 Determination of Source Term

Total source term was estimated for the buildings and equipment by addressing two different areas:

- Surface Contamination of Equipment and Structures, and
- Internal Residual Contamination in Equipment.

An evaluation of radioisotopes contributing to the total activity was also performed.

4.2.1 Calculation of Source Term Associated with Surface Contamination of Equipment and Structures

Removable surface contamination data from the Table in Attachment II to SFC's Site Characterization Report (Site Characterization Radiation and Contamination Survey Structures and Equipment Maximums) was used in the development of source term. Values for each area were applied to each database line item. For fixed contamination, although SFC provided a suggested range of 10 to 100 times the removable contamination (see Recommendations Section for further explanation), it was assumed that fixed plus removable contamination was equal to 50 times the removable level. Conversion to curies indicated the use of maximum values for each database item biased the amount of source term. To reduce the bias, a "total adjusted dpm" value was developed by applying ratios of average dpm by level or building. The data from the Figures from Attachment II to SFC's Site Characterization Report were entered into a database and averaged to develop the ratios. Surface areas were developed during volume take-offs and were used in the calculation of the source term. Appendix I gives the methodology used in calculating each line item.

Assumptions:

- Fixed plus removable contamination is equal to 50 times the removable contamination.
- Source term for disposal in the cell will be based on the anticipated level of contamination after the bulk of the process material is removed.

- Average of maximum contamination levels were used for walls, roof, and where smear data was not available. For minor miscellaneous items such as trucks, smear values were assumed based on experience.
- A factor of 1480 kilograms per curie for natural uranium was used in converting kilograms of process material to curies.
- A factor of 2.22×10^{12} dpm per curie was used to convert dpm to curies.
- A factor of 25% of pipe surface area was used to calculate source term because vertical pipe will collect little surface contamination and only the upper portion of horizontal pipe will collect surface contamination.

4.2.2 Calculation of Source Term Associated with Residual Contamination in Equipment

4.2.2.1 B&W NESI Evaluation

An engineering estimate was developed for the residual quantity of natural uranium remaining in the SFC UF_6 facility using B&W NESI experience as the owner, operator, and decontamination contractor of low enriched uranium conversion facilities. All of the chemical unit operations in these facilities are similar to those encountered at the SFC facility except that the scale of operations was smaller (i.e. 300 to 1000 MTU/yr versus 10,000 tons/yr.). Sources of information for this engineering estimate also include a discussion conducted by Mr. Richard Kingsley with Mr. John Ellis on September 17, 1996 that reviewed the Sequoyah Facility 1993 clean out program and SFC Facility P&ID's and engineering equipment arrangement drawings.

The weekly enrichment clean outs conducted at B&W uranium conversion and processing facilities are very similar to those proposed at the SFC Facility. In addition, B&W NESI has completed terminal clean-out during D&D of three B&W owned and operated uranium processing facilities. This experience has demonstrated that there are several variables that affect the quantity of uranium remaining in facility equipment following clean-out and decontamination. These include:

- Type of unit operation involved (i.e. tanks, chemical reactors, calciners, scrubbers, etc.)
- Physical form of the uranium (i.e. liquid or solid),
- Uranium chemical species present (i.e. soluble or insoluble),
- Equipment design, and
- Facility clean-out procedures used (i.e. nature of the clean-out and the clean out time allowed).

As a consequence, an engineering estimate of the residual quantity of uranium remaining in a facility is useful as follows:

- provides an order of magnitude estimate of the quantity of uranium remaining in the facility and an estimate of the percentage of that uranium that could be removed during dismantlement.
- will identify those unit operations that potentially contain the majority of residual uranium and therefore the major source for material to be considered during dismantlement.
- estimates the quantity of uranium that would remain in equipment after a limited decontamination effort. (This limited decontamination effort would involve mechanical removal and cleaning techniques and would not involve liquid chemical equipment cleaning techniques such as chelating methods etc.)

In general four sets of factors were used to estimate internal component contamination:

- a factor of 100 g/m^2 was used for the interior of equipment believed to be moderately contaminated. Typical equipment systems assigned this factor included vessels that processed liquids or contained or stored free flowing uranium solids (UF_4, UO_3, UO_2, and UO_2F_2). These vessels typically do not contain internal components. This value was used for most vessels in the facility including the solvent extraction system. Vessels storing or processing highly soluble uranium solid compounds such as uranyl nitrate were also assigned this factor.
- a factor of 2500 g/m^2 was used to estimate the uranium content of vessels believed to contain high concentrations of uranium residues. In general, this factor was used for vessels that processed solid insoluble uranium compounds and contained complex internals that made clean-out difficult. This value was used for systems such as denitrators, screw conveyors, absorption towers, bucket elevators, filter housings, etc.
- a factor of 1000 g/m^2 was used in a few instances where the potential existed for intermediate levels of internal uranium contamination. This included the solvent extraction pulse column generators where low solubility sludge tend to accumulate.
- a factor of 10 g/m^2 was used for process support equipment that handled liquids and did not routinely come in contact with uranium process materials. This included systems such as fume scrubbers, etc.
- A factor of 25% to 75% was added to the engineering estimates of uranium residues to account for piping contamination and vessels that could not be located on equipment arrangement drawings.

Results of this engineering evaluation are summarized in Table 2. The total uranium estimated to be in process equipment currently is 2300 kgs (5100 pounds). It is

estimated that up to 90% of this material could be removed during a complete and rigorous mechanical cleaning. An additional 71 kgs (157 pounds) of uranium could be present in the solvent extraction building floor and building. It is unlikely that this latter material can be economically recovered from the base civil/structural/ architectural material.

4.2.2.2 Battelle Pacific Northwest National Laboratory Evaluation

A similar engineering study performed by Battelle Pacific Northwest National Laboratory (BPNNL) for the NRC evaluated the residual radionuclide quantities present in a commercial 10,000 ton per year UF_6 facility. This facility used the same chemical process unit operations employed at the Sequoyah facility. Results from this 1981 study for residual uranium levels are summarized in Table 2. In general, BPNNL used the same methodology as used in this current study (i.e. estimate interior equipment ares and apply a factor for internal contamination). The BPNNL factors were:

- 20 g/m^2 for lightly contaminated surfaces,
- 100 g/m^2 for moderately contaminated surfaces, and
- 1000 g/m^2 for highly contaminated surfaces.

Table 2
Engineering Evaluation of Uranium Hold-up

Description	B&W NESI Evaluation				BPNNL Evaluation	
	Current (kg U)	After Clean (kg U)	Current (Ci)	After Clean (Ci)	After Clean Out (Kg U)	After Decon (Kg U)
Receiving & Sampling	270	27	0.1824	0.0182	215	107
Digestion	84	8	0.0568	0.0054	N/A	N/A
Solvent Extraction	230	23	0.1554	0.0155	1110	560
Solvent Extraction Floor	71	71	0.0480	0.0480	N/A	N/A
UNH Boildown	260	26	0.1757	0.0176	1710	806
Denitration	370	37	0.2500	0.0250	1110	555
Reduction	96	10	0.0649	0.0068	400	200
Hydrofluorination	1000	100	0.6757	0.0676	2100	1050
Fluorination	13	1	0.0088	0.0007	2600	1300
Total	2394	303	1.62	0.20	9245	4578

Assumptions:

- An estimate was developed for the area of equipment internals (i.e. screw feeders, cooling coils etc.) using engineering experience operating similar systems. A factor was applied for the estimated uranium contamination present following the 1993 clean-out completed by SFC Facility personnel. An estimate of the uranium remaining after final mechanical cleaning was developed by assuming that 90% of the residual uranium would be removed. This final terminal clean-out would be accomplished by mechanical disassembly of equipment components.
- Original flush solutions and cleaned out material are not included in this estimate.

The BPNNL and B&W NESI studies provide an order of magnitude consensus of the Uranium quantities to be encountered during the dismantlement of the facility.

4.2.3 Radioisotopic Source Term: Other Radioisotopes

A major contributor to the radionuclide activity source at the Sequoyah Facility is the long half life daughter products of uranium-238 (U^{234}, Th^{230}, Th^{234}, Ra^{226}, and Pb^{210}) and uranium-235 (Pa^{231}, Th^{231}, and Pb^{207}). Characterization information was unavailable for the radioisotopic distribution of these isotopes at the Sequoyah Facility. Information that was available included the smear surveys of the Facility and equipment external surfaces published in the site characterization report. These data were reported in dpm/100cm^2. In addition, radiation dose data (reported in mr/hr) were also reported in the site characterization report.

The Battelle Northwest Laboratory study, referenced in section 4.2.2.2, contains an extensive discussion of the estimated radionuclide quantities emitted from a 10,000 ton/year uranium conversion facility and an estimate of the radionuclide deposition on a conversion facility site after 40 years (i.e. an estimate of the radionuclide site source term at facility shut down). A key attribute of this estimate is that the radionuclides are at secular equilibrium. Given the similarities of the Sequoyah facility, the isotopic ratios should be similar to the radionuclide release data contained within the report. The study indicates that 25.6 percent of site radionuclide activity is due to uranium-238, 1.2 percent of the radionuclide activity is due to uranium-235, and 72.5 percent of the activity is due to uranium daughter products. The uranium daughter activity can be further broken down into individual radionuclides if required for pathway analysis of the on site disposal cell. Significantly, because the data represents secular equilibrium and the uranium and daughter decay products have long half lives, these percentages and total contamination activity levels remain unchanged for periods in

excess of 100 years. We believe this to be representative of the SFC Facility.

Appendix H of this report describes the methods used to convert the Sequoyah facility site characterization information (dpm/100cm^2) to Curies of total activity on the site and on building surfaces and external equipment surfaces. Utilizing the percentage breakdown of activity, this characterization data can be further broken down into an estimate of the quantity of uranium-238, uranium-235, and daughter products on the site. Table 3 contains a summary of the breakdown of the characterization data by principal radionuclide contributor. This analysis indicates that there is a total estimated 0.3 Curies of uranium-235, 5.6 Curies of Uranium-238, and 15.7 Curies of uranium daughter products deposited on site buildings, concrete, and facility equipment and piping surfaces. Using a specific activity of 3.33 x 10^{-7} Curies/g for Uranium-238, the uranium-activity is equivalent to 16.7 metric tonnes deposited on site buildings, equipment, process piping and concrete. This compares to an estimated 2.3 metric tonnes present on the interior of conversion process equipment.

Table 3
Contributing Isotopes to Survey Data

Material	U-235 1.2% (Curies)	U-238 25.6% (Curies)	Daughter Products 72.5% (Curies)	Total Source Term (Curies)
Architectural Materials	.04	.89	2.51	3.46
Asphalt	.00	.01	.03	0.04
Concrete	.03	.68	1.91	2.64
Equipment	.05	1.15	3.25	4.48
Miscellaneous Materials	.00	.03	.08	.11
Pipe	.06	1.29	3.66	5.05
Structural Steel	.02	.33	.94	1.30
Total	.20	4.38	12.38	17.08

Estimating the quantity of daughter product activity in process vessels and collected in on-site storage containers was not possible in the current study. The chemical process

unit operations conducted at the Sequoyah site converting yellow cake to uranyl hexafluoride also separated the daughter products from the uranium materials during three processes:

- In the solvent extraction operation, radium, thorium and protactinium followed the aqueous waste stream (i.e. raffinate stream) to the treatment operation.
- During fluorination of UF_4 forming UF_6, none of the uranium daughter produced volatile fluorides. Thus these products remained as solids (i.e. ash) in the fluorination process.
- Uranium daughter products accumulate in UF_6 shipping cylinders as a result of radioactive decay. The accumulated products were removed during the routine periodic hydrostatic testing of cylinders and the accompanying cylinder washout.

Information was not identified or evaluated on the disposition of these various streams containing the daughter products in the Sequoyah facility.

4.2.4 Depleted Uranium In the Uranium Tetrafluoride Production Building

During site evaluations, the clean-out process for removing in-process materials and cleaning out process equipment for this building was also reviewed. The techniques involved were identical to those used for the main natural uranium conversion facility (i.e. review equipment arrangement drawings determine equipment operating areas, and applying a factor for the internal residual uranium contamination). The depleted uranium tetrafluoride building is estimated to contain 770 kgs of depleted uranium which can be reduced 10 fold to 77 kgs using rigorous mechanical clean-out techniques.

4.3 Cost Estimate for Processing/Staging Waste for Cell

Unit cost factors were developed and placed on each line item within the database for size reduction and staging. Table 4 lists the factors and associated costs for labor and equipment operation by Material Category and Type. Facility costs were not included in the unit rates and have been added as a separate line item.

Table 4
Estimated Cost of Size Reducing & Staging Materials

Material Category	Material Type	Cost Factor ($ per)	Factor Applied to	Cost ($000)
Architectural	Block	$2/ft^3	Volume	$163
Architectural	Miscellaneous, Handrails	$1/ft^3	Volume	$42
Architectural	Corrugated Metals, Steel Flooring	$2/ft^2	Surface Area	$834
Architectural	Roofing	$2/ft^2	Surface Area	$547
Asphalt	Asphalt	$1/ft^2	Surface Area	$56
Concrete	Concrete	$2/ft^2	Surface Area	$2,809
Equipment	All	$3/ft^3	Volume	$2,156
Miscellaneous	All	$2/ft^3	Volume	$777
Pipe	All	$2/ft^3	Volume	$108
Structural Steel	All	$4/ft	Linear Feet	$465
Size Reduction Facility				$870
Total				$8,827

4.4 Size Reduction and Size Reduction/Decon Facilities

The size reduction and size reduction/decontamination facilities were developed by addressing volume reduction and decontamination methods for various materials and shapes. Process lines were developed for material/shape combinations. The following assumptions were used in the design of both facilities:

- Waste is brought in from one part of facility at a time (i.e. know source, don't cross contaminate DUF4 with SX, etc.).
- Loose and packaged materials may be placed in cell, main concern is subsidence.
- Bulk uranium bearing material is mechanically cleaned out in the size reduction facility. This material will not be placed in the cell.
- Limited survey required for disposal in cell.
- All materials are moved via forklift.
- Materials such as roofing are loaded directly into boxes during remediation and are not size reduced or decontaminated.

4.4.1 Size Reduction Facility

4.4.1.1 Facility/Process Description

Design of size reduction facility assumed the following assumptions:

- Concrete is cut to a predetermined size and placed directly into cell.
- Asphalt and underground utilities are left in place and treated with soils and there are no size reductions.
- Large equipment/structural materials are to be cut to manageable size and stacked for disposal.
- Small equipment and miscellaneous materials are compacted.
- Pipe, block, structural steel, and corrugated metal are stacked to minimize void space.

The overall facility size is 40' X 60'. The facility can be set up inside a pre-engineered type building or within an existing structure. The main operations in the facility are cutting, bulk uranium removal, compacting, and staging. The facility floor plan is shown in Figure 1. Material flows through the facility in three basic process lines:

- Line A - Staging only.

  Materials such as block, structural steel, and corrugated metal do not exhibit a significant amount of volume reduction by conventional methods and do not contain bulk U-bearing materials. These types of materials will be vacuumed to remove loose contamination, tightly stacked and packaged for placement in cell. Reference Figure 4 for Flowsheet.

- Line B - Bulk Removal/Cut

  Equipment will be cut open and cleaned of visual U-bearing material. Pipes will only be cut if necessary to facilitate cleaning. The U-bearing material will be collected for recycling. Materials for disposal will be cut to manageable size, stacked, and packaged. Parts of the equipment based on material and size may be compacted prior to disposal. Reference Figure 5 for Flowsheet.

- Line C - Supercompact

  Miscellaneous materials and small items such as wiring, tubing, paper, equipment parts exhibit large fluff factors if just placed in a bag, drum, or box for disposal. To minimize both occupied space and subsidence, small items will be supercompacted. Gross vacuuming will be performed during loading of the compactor. Reference Figure 6 for Flowsheet. An economic analysis is recommended for the use of the supercompactor.

4.4.1.2 Major Equipment List for Size Reduction Facility

40' X 60' Pre-engineered Building, $20,000
VEC Loader Spartan II - HEPA Vacuum System to Clean Bulk Uranium, $88,000
HEPA System, $6,300
3 Oxygasoline Torches, $3,000
Mobile Supercompactor on a 40' trailer, $750,000 (25,000 ft^3, 20 lb/ft^3, $1.5/lb.)

The estimated cost of this facility and equipment totals $867,300. The supercompactor is the major contributor to facility cost. Use of a box or other type of compactor would reduce the cost over $500K. Reference Appendix I for descriptions of equipment.

4.4.2 Size Reduction/Decontamination Facilities

4.4.2.1 Facility/Process Description

The size reduction/decontamination facility was designed under the following assumptions:

- All permits and legal/habitability issues will be addressed locally by Sequoyah Fuels Corporation.
- Decontamination will be used for the purpose of free releasing materials which have a recycle value or reducing the amount of curies being placed in the cell.
- Underground utilities are left in place and treated with soils and there is no size reduction or decontamination.
- All materials are moved via forklift.
- Water effluent from the chemical cleaning operation will be recycled and used as make-up water for the solvent. Maximum excess water created is estimated to be 10 gallons per month with approximately 1500 gallons at the end of operation for solidification. Use of temporary berms will be needed for spill control.
- Concrete, block, and asphalt are addressed with the crushing plant.

The size reduction/decontamination facility is similar to the size reduction facility discussed in 4.4.1 with the addition of decontamination operations. The overall size for the decon/size reduction facility is 50' X 90'. This facility can be set up inside a pre-engineered building or within an existing structure. Decon operations involve abrasive sponge blasting, shot blasting, and chemical cleaning. The facility floor plan is shown in Figure 2. There are three decon process flows:

- Line A - Shot Blasting

  Large items with planar surfaces will be decontaminated for free release using a shot peening operation. This operation is automated from the standpoint that material feeds into a chamber from one end and comes out clean on the other. It should be noted that the material will require turning over so that all sides will be cleaned. Materials suitable for shot blasting are structural steel and corrugated metal. Reference Figure 7 for Flowsheet.

- Line B - Sponge Blast Large Equipment/Vessels

  Items with irregular or curved surfaces will be cleaned for free release by abrasive sponge blast. This is a manual operation where an operator controls a wand inside a glove box. A glove box is being used to minimize personnel exposure to airborne contaminants. Sections of large equipment and vessels are suitable for this operation. Reference Figure 8 for Flowsheet.

- Line C - Chemical Cleaning

  Chemical cleaning will be used for items with inaccessible surfaces and large quantity items such as piping. Free release can be expected for pipe and items where dismantlement will allow for survey. Items such as motors or pumps will have contamination removed. However, the cost of proving them to be below releasable limits prohibits free release of these items. Equipment/pipe which have potential for containing fluorine compounds will not be chemically cleaned due to potential chemical reactions. Reference Figure 9 for Flowsheet.

4.4.2.2 Major Equipment List for Size Reduction/Decontamination Facility

50' X 90' Pre-engineered Building, $43,600
VEC Loader Spartan II - HEPA Vacuum System to Clean Bulk Uranium, $88,000
Abrasive Blast - $60,000
Spinblast Roll Conveyor Structural Cleaning Machine - Shot Blast System, $103,000
Chemical Cleaning System, $360,000
HEPA System, $6,800
3 Oxygasoline Torches, $3,000
Glove Box, $20,000
Clean Air Machine, $1,000
Mobile Supercompactor on a 40' trailer, $750,000 (25,000 ft^3, 20 lb/ft^3, $1.5/lb.)

The estimated cost of this facility and equipment totals $1,435,400. The supercompactor is the major contributor to facility cost. Use of a box or other type of compactor would reduce the cost over $500K. Reference Appendix I for descriptions of equipment.

4.4.2.3 Crushing Plant

A crushing plant is not a size reduction or decontamination facility, however, it can significantly reduce the volume of material for burial. Survey and free release of concrete, block and asphalt is labor intensive. Crushing allows for samples to be taken to free release the material. Additionally, the crushed materials have several uses:

- Aggregate for pouring concrete on site
- Sold as aggregate to a construction/road company, and
- Fill for construction projects.

For crushing to be a viable option, characterization of concrete structures, block, and asphalt must indicate minor surface contamination and show that contamination does not extend throughout the thickness of the material. Reference Figure 10 for Flowsheet.

Reference Appendix I for descriptions of equipment.

4.4.2.4 Major Equipment list for Crushing Plant

Feed Hopper, Mag-Separator, Vibrating Grizzly Feeder, Impact Crusher, $200,000
100' x 24" Conveyor System, $50,000
4 15' x 15' Bins, $100,000
30' x 60' Pre-engineered Building, $16,200
HEPA, $35,000

The estimated cost for the crushing plant totals $401,200. Reference Appendix I for descriptions of equipment.

4.5 Staging

Staging will be accomplished by the following methods:

- Large items such as cut tanks, vehicles, corrugated, and structural steel will be banded using 2" x 1/4" steel or chains in groups or bundles up to 20 tons.
- Piping and equipment will be stacked and banded in 10' length in bundles up to 5 tons.
- Blocks and smaller items will be shrink wrapped.
- Pucks from supercompactor can be placed directly in cell.
- Crushed concrete can be used to fill voids if not sold.

5. Recommendations

During the performance of these projects, many observations were made which have been articulated below in the form of recommendations to bridge into the next phase of the study. The recommendations are divided into 3 categories, Quantitative, Physical, and Future Effort for Continuity.

5.1 Quantitative

5.1.1 Further Detailed Information Needs to be Quantified

As a conceptual design, the accuracy of volume is +50%, - 25%. Lack of drawings for specific structural features, such as foundations, pad thicknesses, and piping are primary influences. A determination of actual thicknesses on the Yellowcake Pad and UF6 Cylinder Pad is recommended due to the large surface area involved. Further drawing investigation would influence foundations. Piping investigations would involve a detailed walk-through and comparison with drawings.

5.1.2 Additional Trade-off Analysis

Trade-off analysis should be performed for decon vs. disposal of large selected equipment.

5.1.3 Choice of Factor of 50 for Contamination Calculations

For fixed contamination, SFC provided a range of 10 to 100 times the removable contamination. A factor of 50 was used to demonstrate a conservative upper boundary. Further characterization, fixed surveys and scabble samples, should be performed statistically for structures and equipment to further reduce the upper limit. Isotopic analysis for the site should also be performed to improve source term calculations.

5.1.4 Limited Information r.e. Design Basis for Waste Calcining System

Available facility characterization data are not sufficient to establish a design basis or needs for a waste calcining system. The primary objective of such a system would be to stabilize sludge deposits scraped out of process equipment by converting soluble uranium salts such as uranyl nitrate or UO_2F_2 to stable oxides, to facilitate off-site disposal or partial recycling. Preferred treatment methods will vary depending upon what chemical species are present. Before any thermal treatment can be considered, it is essential that absence of any organics in the sludge be established. If uranyl fluoride is the dominant constituent, a simple hydrogen peroxide treatment may be used to convert the uranyl fluoride to UO_3, or an ammonia solution may be applied to

form ammonium diuranate which can subsequently be calcined to form U_3O_8. Most of these treatments will require an off-gas scrubber system to remove NO_x, ammonia, or fluoride fumes formed by the decomposition reactions associated with the stabilization treatments. If equipment was thoroughly flushed prior to closure of the facility, the quantity of residual sludge may be very small. Appropriate equipment recommendations will have to be based on more detailed surveys for this area.

5.1.5 Evaluate Daughter Products Further

Future evaluation of daughter products is recommended to identify the past disposition practices for these materials. Potentially they could represent a significant source term in a pathway analysis if these materials remained on-site and are to be disposed of in the on-site cell.

5.2 Physical

5.2.1 Stack Concrete Slabs

Concrete slabs should be cut and stacked. This eliminates "fluff" factors associated with crushing. Soils should be packed around concrete in cell to fill voids.

5.2.2 Use of Fencing

Fencing may be used as mesh in grout with no volume reduction.

5.2.3 Underground Piping/Utilities

Underground piping/utilities should be cut and capped in place, and treated with soils. Liaison is required with the sub-contractor responsible for soils and per local building codes.

5.2.4 Asphalt Handling

If asphalt is not to be free released, it should be remediated with soils and placed directly in cell.

5.2.5 Vacuuming of Key Items

Handling/staging costs are decreased if structural steel, corrugated metal, and block are vacuumed and staged as removed from buildings instead of transported to size reduction facility.

5.3 Future Effort for Continuity

5.3.1 Integrated Engineering/Planning Effort - Burial Cell

Input from B&W NESI should be factored into the basic design criteria for the burial cell, including but not limited to factors such as:

- Total cell size/Unit subdivision detail
- Exact location and when available in sequence for use
- Exact configuration and method planned for placing items in cell for disposal
- How recycled materials will be used to reduce cell size.

5.3.2 Volume Reduction vs. Decontamination

B&W NESI recommends further cost analysis to determine best alternatives for volume reduction vs. decontamination. Remedial action alternatives should be a part of this study.

5.3.3 Alternative/Additional Potential for Concrete

Additional characterization is recommended for concrete pads to declare them as non-affected areas. This will greatly reduce the number of grids to be surveyed and core samples taken to free release these pads. If free release is accomplished, the volume of material for disposal in cell is greatly reduced. Concrete slabs can be sold for use in off-shore reefs. This should be carefully investigated during cost evaluations.

5.3.4 Use of BPNNL & B&W NESI Conceptual Study Results

The BPNNL study estimated that the reference facility would contain a residual of 9,200 kgs of uranium which would be reduced to 4,100 kgs following decontamination. The variation in the two studies illustrate the subjectivity in such studies. The facility operating experience of the engineering staff conducting the study can affect the result. B&W NESI recommends that these study results, along with those of the BPNNL study, be used to establish boundary conditions in a sensitivity study of the pathway analyses for the licensing of the on-site disposal cell. The two engineering studies probably give an order of magnitude for the uranium quantities to be encountered during dismantlement and D&D of the Sequoyah facility. The current B&W NESI study does identify those unit operations likely to contain large quantities of uranium and require engineering attention while planning dismantlement and D&D.

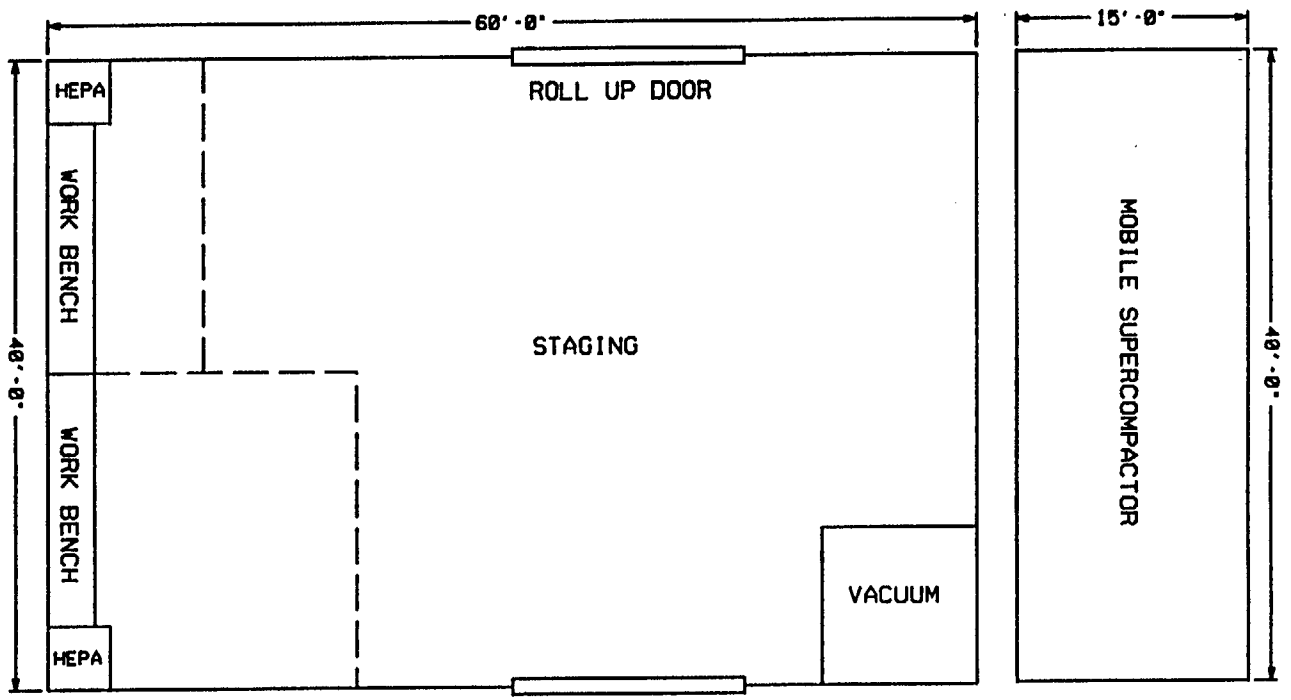


FIGURE 1
SIZE REDUCTION FACILITY
FLOOR PLAN

SEQUOYAH FACILITY
WASTE EVALUATION & SIZE
REDUCTION/DECONTAMINATION
FACILITY REPORT

B&W
NESI
B&W Nuclear Environmental Services, Inc.

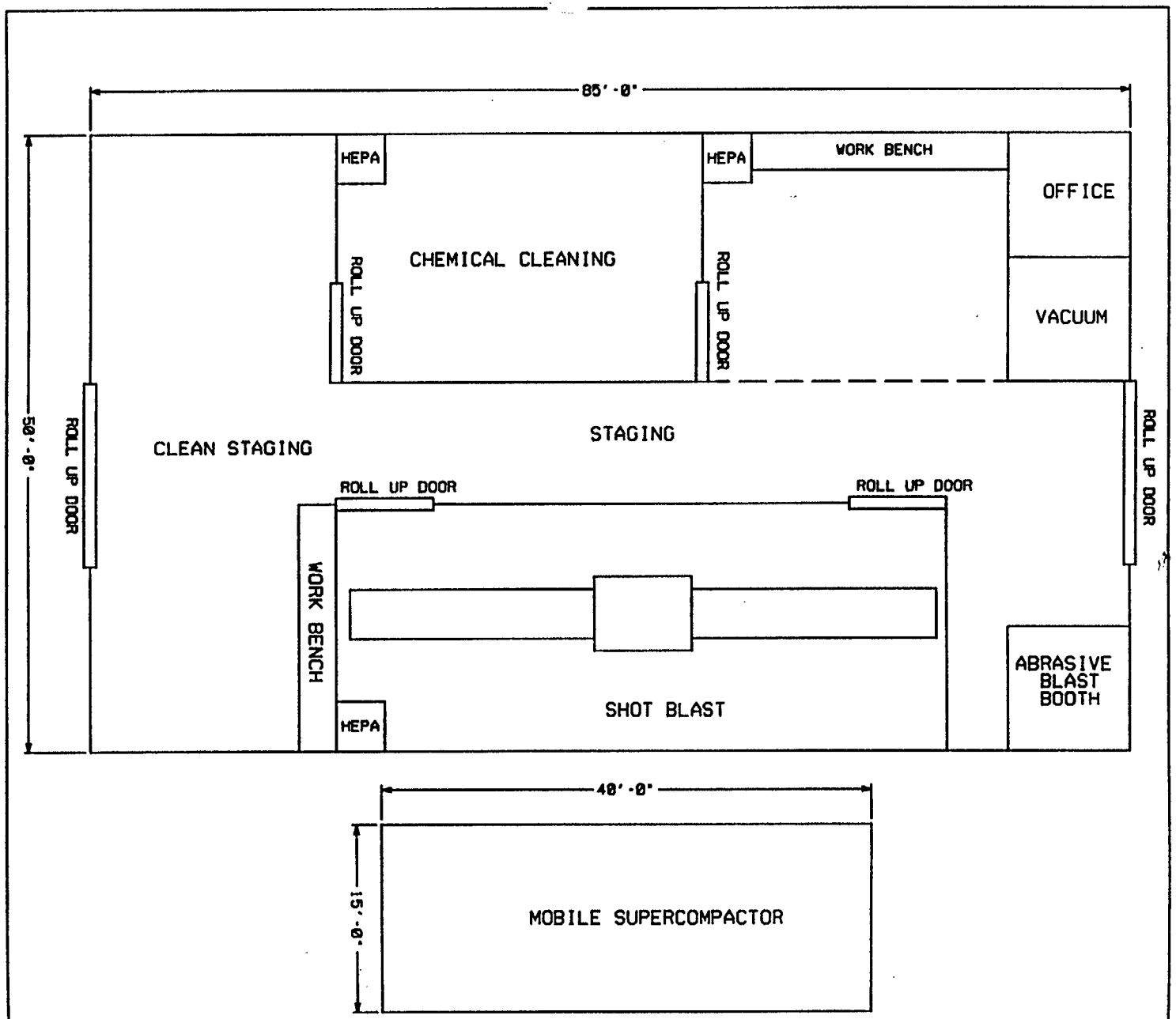


FIGURE 2
SIZE REDUCTION/
DECONTAMINATION FACILITY
FLOOR PLAN

SEQUOYAH FACILITY
WASTE EVALUATION & SIZE
REDUCTION/DECONTAMINATION
FACILITY REPORT

B&W
NESI
B&W Nuclear Environmental Services, Inc.

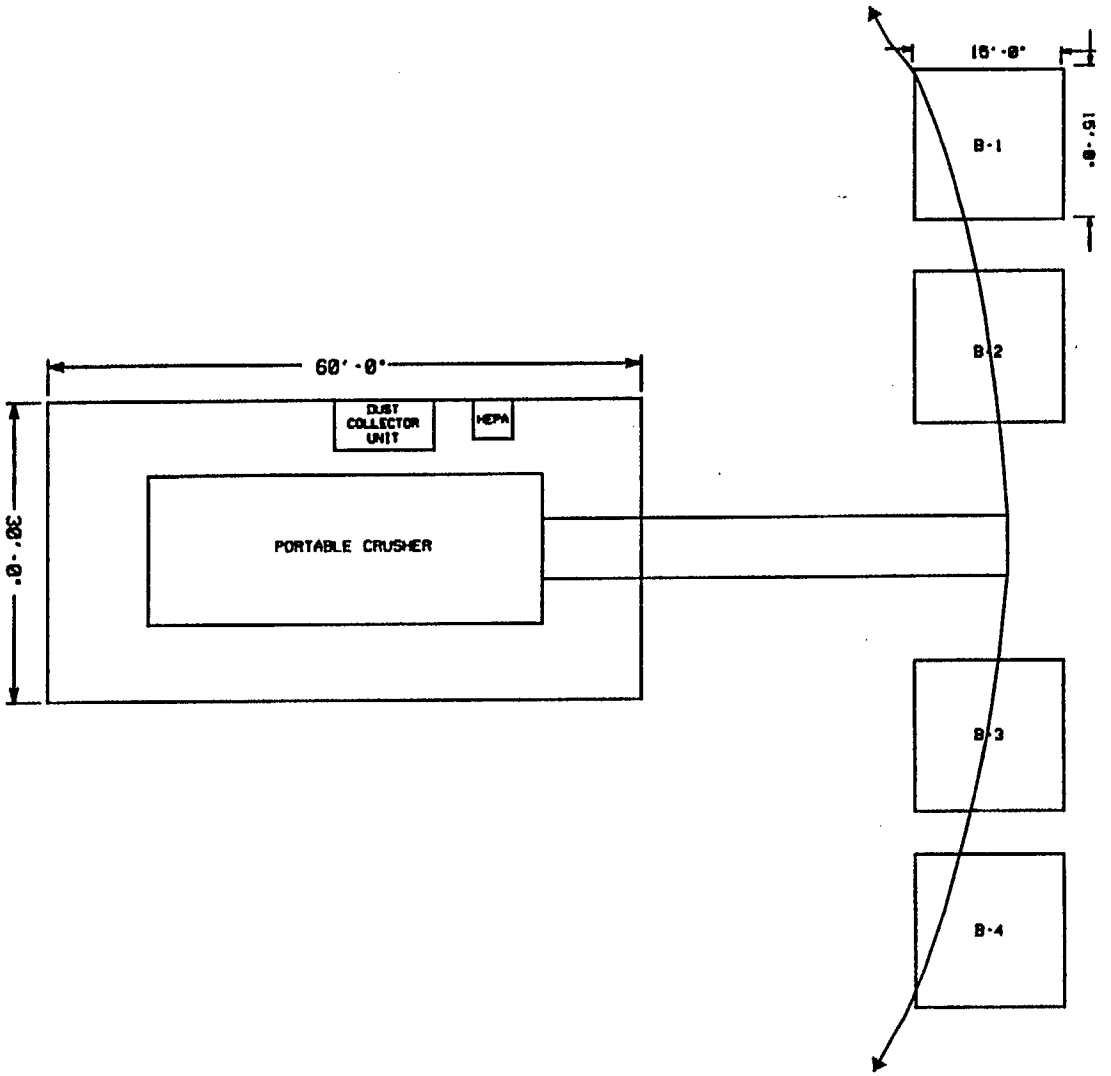


FIGURE 3
CRUSHING PLANT
FLOOR PLAN

SEQUOYAH FACILITY
WASTE EVALUATION & SIZE
REDUCTION/DECONTAMINATION
FACILITY REPORT

B&W
NESI
B&W Nuclear Environmental Services, Inc.

Size Reduction - Line A

Staging Only

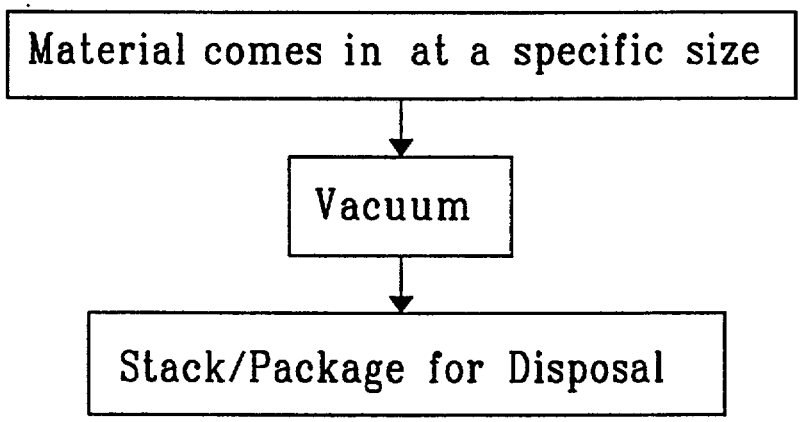


Figure 4 Size Reduction Facility
Line A - Staging only Flowsheet

Sequoyah Facility
Waste Evaluation & Size Reduction/
Decontamination Facility Report

B&W
NESI
B&W Nuclear Environmental Services, Inc.
a McDermott company

Size Reduction - Line B

Bulk Removal/Cut

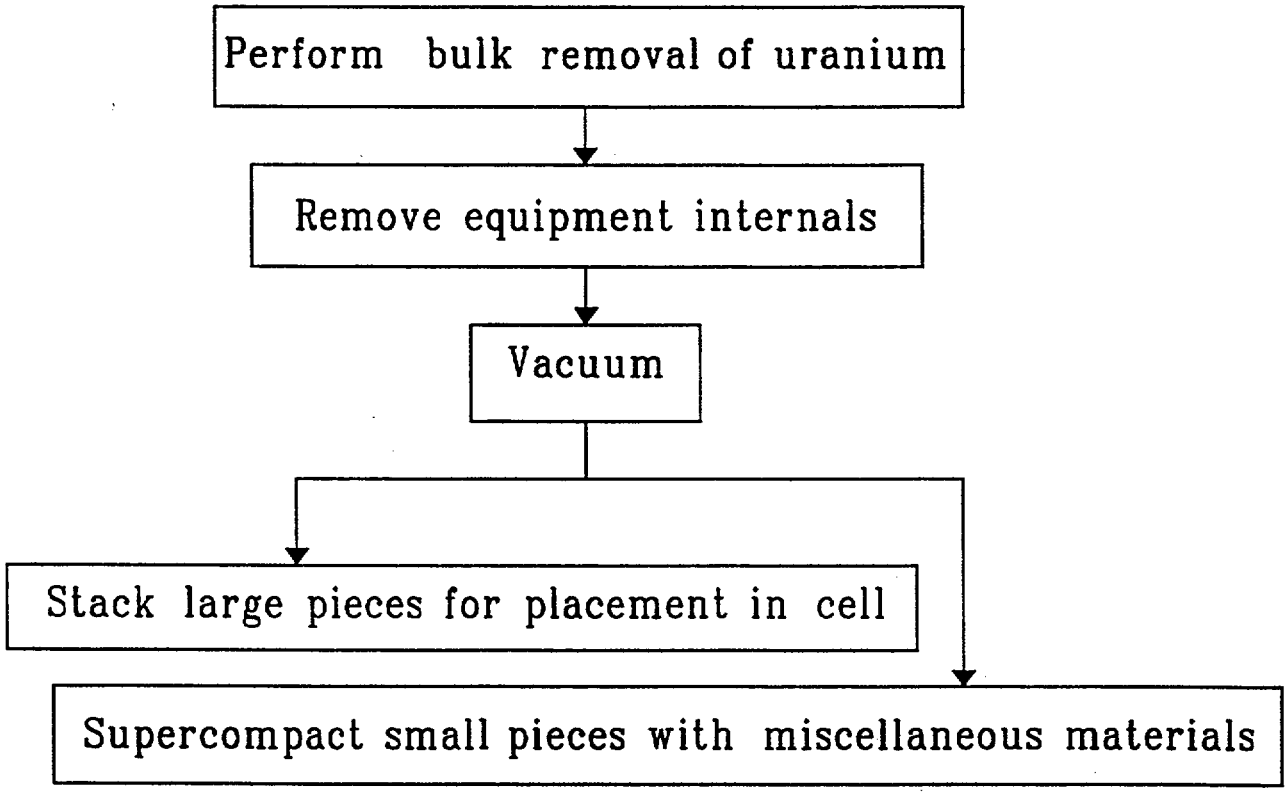


Figure 5 Size Reduction Facility
Line B - Bulk Removal/Cut Flowsheet

Sequoyah Facility
Waste Evaluation & Size Reduction/
Decontamination Facility Report

B&W NESI
B&W Nuclear Environmental Services, Inc.
a McDermott company

Size Reduction - Line C

Supercompact

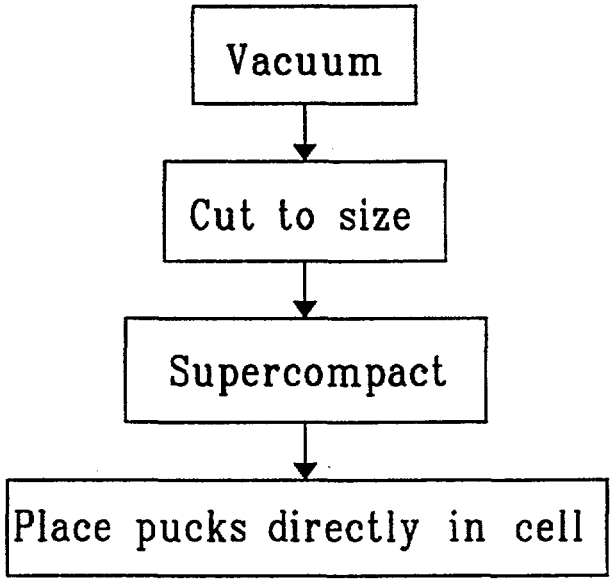


Figure 6 Size Reduction Facility
Line C - Supercompact Flowsheet

Sequoyah Facility
Waste Evaluation & Size Reduction/
Decontamination Facility Report

B&W
NESI
B&W Nuclear Environmental Services, Inc.
a McDermott company

Size Reduction & Decon Line A

Shot Blasting

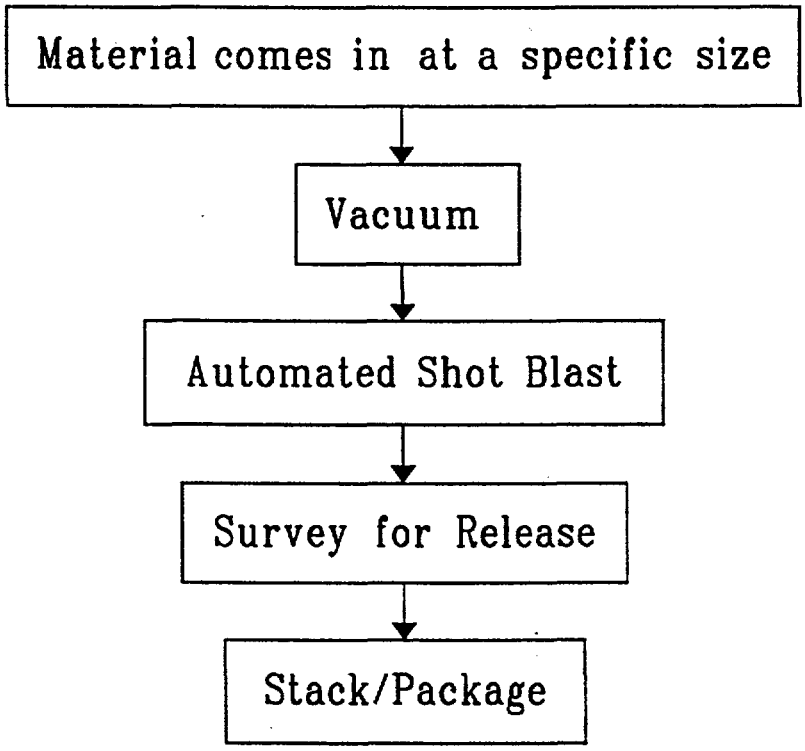


Figure 7 Size Reduction/ Decontamination Facility Line A - Shot Blasting Flowsheet

Sequoyah Facility
Waste Evaluation & Size Reduction/ Decontamination Facility Report

B&W NESI
B&W Nuclear Environmental Services, Inc.
a McDermott company

Size Reduction & Decon Line B

Abrasive Blasting

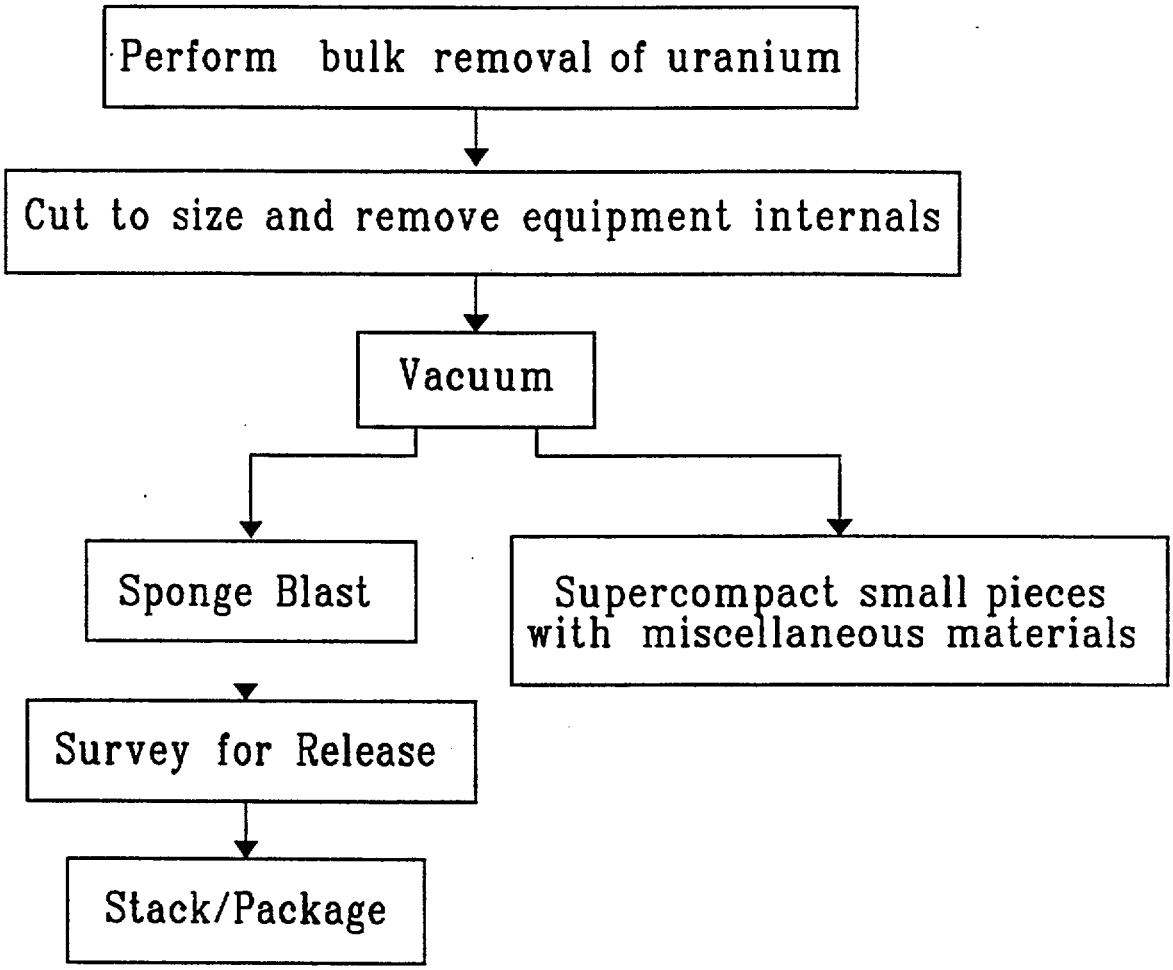


Figure 8 Size Reduction/ Decontamination Facility Line B - Abrasive Blasting Flowsheet

Sequoyah Facility
Waste Evaluation & Size Reduction/ Decontamination Facility Report

B&W NESI
B&W Nuclear Environmental Services, Inc.
a McDermott company

Size Reduction & Decon Line C

Chemical Cleaning

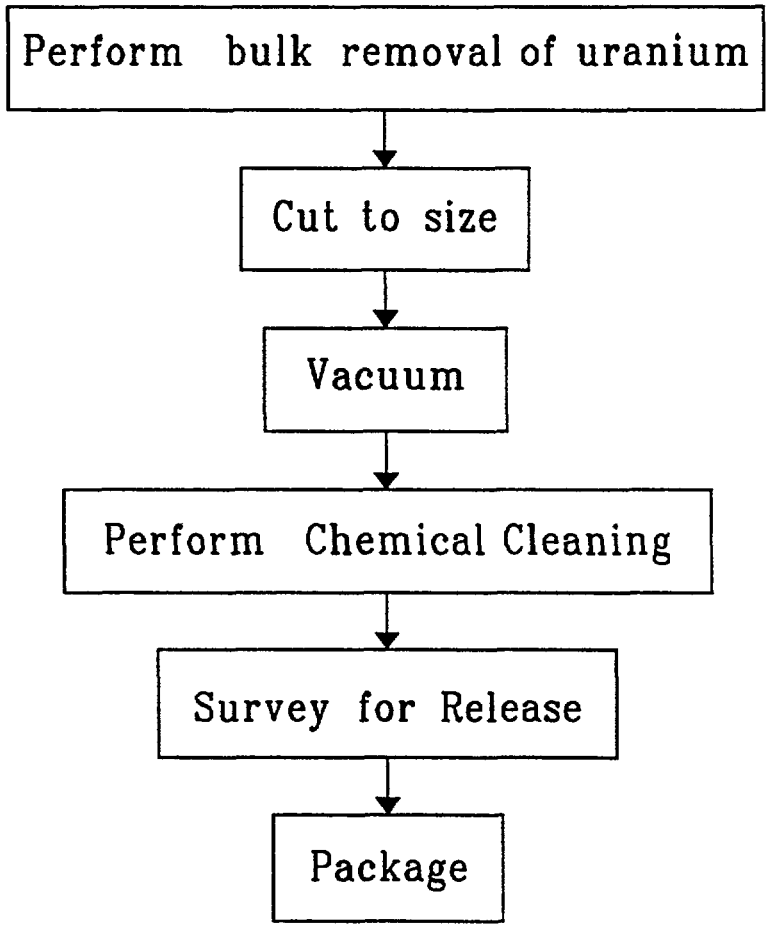


Figure 9 Size Reduction/ Decontamination Facility Line C - Chemical Cleaning Flowsheet

Sequoyah Facility
Waste Evaluation & Size Reduction/ Decontamination Facility Report

B&W NESI
B&W Nuclear Environmental Services, Inc.
a McDermott company

Crushing Plant

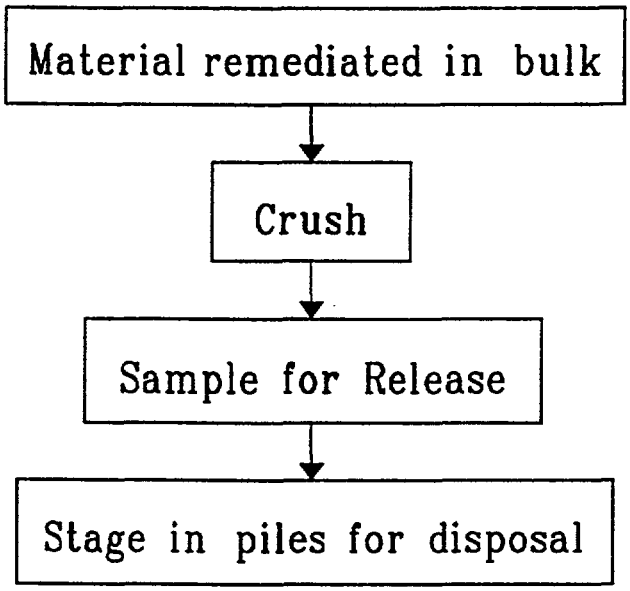


Figure 10 Crushing Plant Flowsheet

Sequoyah Facility
Waste Evaluation & Size Reduction/
Decontamination Facility Report

B&W NESI
B&W Nuclear Environmental Services, Inc.
a McDermott company

Material	Volume Cu. Ft.	Disposal Volume Cu. Ft.
Architectural Materials	115679	95449
Asphalt	13255	13255
Concrete	475788	499581
Equipment	340080	209490
Miscellaneous Materials	181469	143589
Pipe	25845	24432
Structural Steel	37349	37344
Total Volume	1189467	1023140

Material	Activity Curies
Architectural Materials	3.464
Asphalt	0.035
Concrete	2.643
Equipment	4.476
Miscellaneous Materials	0.106
Pipe	5.049
Structural Steel	1.302
Total Curies	17.078

Bechtel Building

Material		Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Curies
Architectural Materials		1819	1128	0.0022
Concrete		1638	1720	0.0005
Equipment		120	120	0.0001
Miscellaneous Materials		3900	2925	0.0008
Structural Steel		139	139	0.0005
	Total Volume	7616	6032	0.0043

DUF4

Material		Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Curies
Architectural Materials		8559	6077	0.7214
Concrete		14289	15004	0.7877
Equipment		37013	25625	0.6349
Miscellaneous Materials		120	120	0.0075
Pipe		532	487	0.1191
Structural Steel		2080	2078	0.5472
	Total Volume	62595	49391	2.8181

General Site

Material		Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Curies
Architectural Materials		4535	2078	0.4743
Asphalt		13255	13255	0.0357
Concrete		342594	359726	0.8032
Equipment		124364	76363	0.0409
Miscellaneous Materials		144061	115128	0.0981
Pipe		15490	15488	0.0001
Structural Steel		68	68	0.0000

	Total Volume	644369	582106	1.4526

Main Process Building

Material	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Curies
Architectural Materials	82988	78479	0.8343
Concrete	88157	92566	0.3599
Equipment	140111	84749	3.0669
Miscellaneous Materials	33387	25416	0.0000
Pipe	7875	7536	3.6055
Structural Steel	25365	25364	0.0759
Total Volume	377886	314110	7.9429

Miscellaneous Digest

Material	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Curies
Architectural Materials	2573	772	0.6666
Concrete	4892	5138	0.1779
Equipment	2671	889	0.0878
Structural Steel	37	38	0.0155
Total Volume	10175	6837	0.9479

Raffinate

Material	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Curies
Architectural Materials	2472	775	0.0878
Concrete	6945	7292	0.0351
Equipment	16795	10189	0.0423
Pipe	9	9	0.0000
Structural Steel	40	40	0.0000
Total Volume	26262	18305	0.1653

S/X

Material		Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Curies
Architectural Materials		5097	3850	0.6759
Concrete		12699	13335	0.4779
Equipment		18778	11419	0.6037
Pipe		1938	912	1.3243
Structural Steel		9617	9617	0.6628
	Total Volume	48131	39133	3.7448

Solid Waste

Material		Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Curies
Architectural Materials		594	178	0.0014
Concrete		2268	2381	0.0008
	Total Volume	2862	2559	0.0022

WPC Building

Material		Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Curies
Architectural Materials		7038	2112	0.0003
Concrete		2304	2419	0.0000
Equipment		226	136	0.0000
	Total Volume	9568	4667	0.0003

Building: Bechtel Building

Area: Bechtel Building

Equipment Classification: Equipment

Description		Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Motors		120.0	120	0.1586
	Total for Area:	120.0	120	0.1586
	Total for Building:	120.0	120	0.1586

Building: DUF4

Area: DUF4

Equipment Classification: Bin

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
No. 1 Product Storage Bin	314.1	63	6.1261
No. 1 Product Storage Bin	1994.6	399	19.3053
No. 2 Product Storage Bin	314.1	63	6.1261
No. 2 Product Storage Bin	1994.6	399	19.3053
Product Weigh Bin	24.0	5	1.1805

Equipment Classification: Conveyor

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Cooling Screw Conveyor	27.4	27	0.9375
Cooling Screw Conveyor	27.4	27	2.4791
Dust Screw Conveyor	25.2	25	0.6784
Empty Drum Conveyor	96.0	29	6.1556
Filling Drum Conveyor	42.0	13	2.4875
Packaging Drum Feed Screw Conveyor	3.1	3	0.2980
Packaging Drum Feed Screw Conveyor	1.7	2	0.3063
Product Transfer Screw Conveyor	3500.0	3500	6.5351
Product Transfer Screw Conveyor	3500.0	3500	6.5351
Scale Conveyor	24.0	7	1.0548
Weigh Bin Screw Conveyor	5.5	6	0.1769
Weigh Bin Screw Conveyor	7.0	7	0.6324

Equipment Classification: Elevator

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Product Bucket Elevator	41.0	12	0.6352
Product Bucket Elevator	342.0	103	11.8829

Equipment Classification: Equipment

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
"H" Lifting Frame (Bridge Crane)	40.0	40	2.2345
"H" Lifting Frame (Jib Crane)	40.0	40	2.2345
20 Ton Bridge Crane	42.0	42	45.7036

Building: DUF4

Area: DUF4

Equipment Classification: Equipment

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Air Receiver	37.7	38	1.4967
Autoclave	622.0	373	9.9342
Autoclave	622.0	373	9.9342
Autoclave	622.0	373	9.9342
Autoclave	622.0	373	9.9342
Auxiliary rack 1	516.0	155	7.9063
Auxiliary rack 2	480.0	144	7.3733
Blending Cone	251.2	151	4.7683
Blending Cone	251.2	151	4.7683
Breathing Air System	108.0	65	3.0356
Building Unit Heater	15.0	12	0.7799
Building Unit Heater	15.0	12	0.7799
Building Unit Heater	15.0	12	0.7799
Building Unit Heater	15.0	12	0.7799
Building Unit Heater	15.0	12	0.7799
Building Unit Heater	15.0	12	0.7799
Building Unit Heater	15.0	12	0.7799
Building Unit Heater	15.0	12	0.7799
Building Unit Heater	15.0	12	0.7799
Carbon Trap	18.8	19	0.3506
Carbon Trap	18.8	19	0.3506
Carbon Trap	18.8	19	0.3506
Carbon Trap	18.8	19	0.3506
Carbon Trap	18.8	19	0.3506
Carbon Trap	18.8	19	0.3506
Carbon Trap	18.8	19	0.9271
Carbon Trap	18.8	19	0.9271
Carbon Trap	18.8	19	0.9271
Carbon Trap	18.8	19	0.9271
Carbon Trap	18.8	19	0.9271
Carbon Trap	18.8	19	0.3506
Condensate Pump (Autoclave)	3.0	2	0.2740
Condensate Pump (Autoclave)	3.0	2	0.2740
Condensate Pump (Autoclave)	2.2	1	0.2213
Condensate Pump (Autoclave)	2.2	1	0.2213
Condensate Tank Agitator	11.1	8	0.7633

Building: DUF4

Area: DUF4

Equipment Classification: Equipment

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Crusher/Delumper	3.4	3	0.2797
Crusher/Delumper	3.4	3	0.2797
Cyclone Receiver - Pneumatic Refeed	67.9	41	2.0874
Cyclone Receiver - Pneumatic Refeed	67.9	41	2.0874
Cyclone Rotary Feed	1.1	1	0.1323
Cylinder Cart	168.0	168	4.3848
DUF4 Breathing Air Filter/Purificat	20.6	12	0.5718
DUF4 console	120.0	72	0.0241
Demister Off Gas Fd. To H2 Burner	96.1	58	2.7236
Door Operator	6.7	7	0.4743
Door Operator	6.7	7	0.4743
Door Operator	6.7	7	0.4743
Drum Dryer Exhaust Fan	8.0	4	0.5059
Drum Dryer Exhaust Fan	6.0	3	0.4913
Drum Drying Air Blower	33.0	17	1.4056
Drum Drying Air Blower	24.8	12	1.2286
Drum Drying Air Heater	35.0	28	1.4545
Drum Weigh Scale	24.0	17	1.0962
Dust Collector	1717.2	343	9.0786
Dust Collector Rotary Airlock	1.1	1	0.1323
Dust Collector Rotary Feed	1.1	1	0.1323
Filter Rotary Airlock	1.1	1	0.1323
HF Refrigeration Unit 1	1800.0	1800	18.9729
HF Refrigeration Unit 1	2160.0	2160	21.2496
HF Refrigeration Unit 2	1800.0	1800	18.9729
HF Refrigeration Unit 2	2160.0	2160	21.2496
Heeling Air Conditioner	15.0	15	0.7799
Heeling Compressor	1.0	1	0.1264
Hydraulic Unit Pump	16.0	8	0.8432
Hydraulic Unit Pump	16.0	8	0.8432
Hydraulic Unit Pump	28.0	14	1.2227
Hydraulic Unit Pump	28.0	14	1.2227
Hydrogen Burner	282.6	141	5.1656
Knock Out Pot	7.0	7	0.4717
MCC Room Air Conditioner	40.0	40	1.5178
Misc Equipment	87.5	88	2.5297
Molecular Sieves	49.9	50	0.9558

Building: DUF4

Area: DUF4

Equipment Classification: Equipment

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Molecular Sieves	49.9	50	2.3206
Off-Gas Backup Filter	401.9	402	2.6490
Off-Gas Cyclone W/Filter	401.9	241	2.6490
Partial HF Condenser	37.7	38	0.8391
Partial HF Condenser	76.2	46	2.3577
Plant Air Compressor	80.8	49	2.5529
Product Rotary Airlock	1.1	1	0.1323
Product Rotary Feeder, 6"	1.1	1	0.1323
Pulverizer	10.3	10	0.7070
Pulverizer	10.3	10	0.7070
Reactor Cooling Air Blower	36.0	18	1.3913
Reactor Heater	53.1	43	0.8043
Reactor Heater	53.1	43	0.8043
Reactor Heater	53.1	43	0.6241
Reactor Heater	53.1	43	0.6241
Reactor Heater	53.1	43	1.6504
Reactor Heater	53.1	43	1.6504
Reactor Heater	53.1	43	1.6504
Reactor Heater	53.1	43	1.6504
Refeed System Hyd. Pump	18.0	9	0.8854
Refeed System Vibrator	0.4	0	0.0683
Refrigeration For HF Tanks	100.0	100	2.7405
Roof Vent #1 Fan	8.0	4	0.5059
Roof Vent #1 Fan	24.5	12	1.0348
Roof Vent #2 Fan	8.0	4	0.5059
Roof Vent #2 Fan	24.5	12	1.0348
Roof Vent #3 Fan	8.0	4	0.1802
Roof Vent #3 Fan	24.5	12	1.0348
Roof Vent #4 Fan	8.0	4	0.1802
Roof Vent #4 Fan	24.5	12	1.0348
Roof Vent #5 Fan	8.0	4	0.5059
Roof Vent #5 Fan	24.5	12	1.0348
Safety Shower, 1st Floor	14.0	1	0.9697
Safety Shower, 2nd Floor	14.0	1	0.9697
Safety Shower, 3rd Floor	14.0	1	0.9697
Safety Shower, 4th Floor	14.0	1	0.9697
Safety Shower, 5th Floor	14.0	1	0.9697

Building: DUF4

Area: DUF4

Equipment Classification: Equipment

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Safety Shower, Outside	14.0	1	0.9697
Safety Shower, Top HF Rundown Tanks	14.0	1	0.9697
Sample Collector	64.0	13	2.0237
Sanitary Lift Station	5.3	5	0.3725
Sanitary Lift Station Pumps	12.3	6	0.3725
Screen	36.0	36	1.5178
Screen Oversize Box Removal	50.0	50	1.7918
Spare Reactor Tube	94.2	94	4.1061
Total HF Condenser	84.7	51	2.6821
UF6 Feed Hot Box	64.0	13	0.8413
UF6 Feed Hot Box	64.0	13	0.8413
UF6 Feed Hot Box	224.0	45	4.8908
UF6 Feed Hot Box	96.0	19	2.8670
UF6 Surge Tank Hot Box	64.0	13	0.8413
UF6 Surge Tank Hot Box	256.0	51	5.3967
UF6 console 1	99.0	59	2.0321
UF6 console 2	216.0	130	2.5318
UF6 console 3	192.0	115	2.3097
UF6 console 4	84.0	50	1.5102
Valve rack (2)	24.8	15	0.6709
Vibrating Bin Bottom	153.8	154	3.4768
Vibrator	0.4	0	0.0683
Vibrator	0.4	0	0.0683
Vibrator	0.4	0	0.0683
Vibrator (Dust CollecTor)	0.4	0	0.0683
Vibrator (Seal Leg)	0.4	0	0.0683
Vibrator (Seal Leg)	0.4	0	0.0683

Equipment Classification: Reactor

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
UF6 Reactor	322.8	194	2.3347
UF6 Reactor	322.8	194	6.5521

Building: DUF4

Area: DUF4

Equipment Classification: Tank

Description		Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Anhydrous HF Rundown Tank		1962.5	1178	19.8684
Anhydrous HF Rundown Tank		1962.5	1178	19.8684
Condensate Holding Tank		137.3	82	3.1459
Condensate Holding Tank		137.3	82	3.1459
HF Tank		273.8	164	5.4005
Hydrogen Surge Tank (Dissociated Am		70.2	42	2.3526
Hydrogen Surge Tank (Dissociated Am		70.2	42	2.3526
N2 Bump Tank AU-5820		11.8	12	0.8386
N2 Bump Tank AU-5820		11.8	12	0.3454
N2 Bump Tank AU-5821		11.8	12	0.8386
N2 Bump Tank AU-5821		11.8	12	0.3454
UF6 Feed Surge Tank		29.8	30	94.4858
UF6 Feed Surge Tank		29.8	30	33.6679
	Total for Area:	37013.5	25625	634.9813
	Total for Building:	37013.5	25625	634.9813

Building: General Site

Area: Cooling Tower

Equipment Classification: Equipment

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Brine Pit Sump Pump	12.0	6	1.4370
Cooling Tower Raw Water Transfer Pu	12.0	6	1.4370
Cooling Tower Recirculating Pump	12.0	6	1.4370
Cooling Tower Recirculating Pump	59.6	30	5.3112
Cooling Tower Recirculating Pump	59.6	30	5.3112
Cooling Water Supply Pump	62.8	31	5.5770
Cooling Water Supply Pump	62.8	31	5.5770
Diffuser plates	64.3	64	5.4000
Sulfuric Acid Metering Pump No. 2	12.0	6	1.4370
Total for Area:	357.2	210	32.9249

Building: General Site

Area: Cylinder Wash

Equipment Classification: Equipment

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
UF6 Cylinder Wash Station Air Dryer	37.7	38	0.0010
Total for Area:	37.7	38	0.0010

Building: General Site

Area: Miscellaneous

Equipment Classification: Dredges

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Dredges	256.0	256	0.0064

Equipment Classification: Equipment

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Ion exchange column	63.0	38	0.0016
Lime silo	1508.0	905	0.0107

Equipment Classification: Tank

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
#1 Diesel Tank	67.3	40	0.0008
Diesel Storage Tank	235.5	141	0.0009
Fire Water Storage Tank	36624.9	21975	0.0255
Fuel Oil Storage Tank	4578.1	2747	0.0063
Gas Tank	67.3	40	0.0004
Ion Exchange Feed Tank	75.0	45	0.0004
Lime mix tank	283.0	170	0.0030

Equipment Classification: Tank cars

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
7 Semi Tank Cars	23738.4	14243	0.0056
Total for Area:	67496.6	40600	0.0621

Building: General Site

Area: Old Centrifuge Building

Equipment Classification: Equipment

Description		Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Centrifuge		378.0	378	3.2955
	Total for Area:	378.0	378	3.2955

Building: General Site

Area: RCC Evaporator

Equipment Classification: Equipment

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Pumps	120.0	60	0.0080
RCC Evaporator	2513.0	2513	0.0227
Total for Area:	2633.0	2573	0.0307

Building: General Site

Area: Sanitary Waste

Equipment Classification: Equipment

Description		Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Sanitary Waste Package		1600.0	1280	0.0147
	Total for Area:	1600.0	1280	0.0147

Building: General Site

Area: Steam Chest

Equipment Classification: Equipment

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Steam Chest	616.4	308	0.1005
Total for Area:	616.4	308	0.1005

Building: General Site

Area: Tank Farm

Equipment Classification: Equipment

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
40% Nitric ACid Transfer Pump	12.0	6	0.0002
40% Nitric Acid Transfer Pump	12.0	6	0.0002
60% Nitric Acid Transfer Pump	2.0	1	0.0001
60% Nitric Acid Transfer Pump	2.0	1	0.0001
Brine Transfer Pump	1.8	1	0.0000
Brine Transfer Pump	1.8	1	0.0000
Exhaust Fan	81.5	41	0.0010
Liquid Nitrogen Supply	1884.8	1131	0.0076
Propane Pump	12.0	6	0.0002

Equipment Classification: Tank

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
40% Nitric Acid Transfer Tank	2161.4	1297	0.0098
40% Nitric Acid Transfer Tank	2161.4	1297	0.0098
60% NItric Acid Storage Tank	2161.4	1297	0.0098
60% Nitric Acid Storage Tank	2513.2	1508	0.0113
60% Nitric Acid Storage Tank	2161.4	1297	0.0098
AHF Storage Tank	2161.4	1297	0.0098
AHF Storage Tank	2161.4	1297	0.0098
AHF Storage Tank	2161.4	1297	0.0098
Ammonia Storage Tank	2161.4	1297	0.0098
Aqueous HF Tank	2161.4	1297	0.0098
NH3 Storage Tank	2161.4	1297	0.0098
Total for Area:	26137.5	15672	0.1200

Building: General Site

Area: Yellowcake Pad

Equipment Classification: Equipment

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Lickety Split Drum Compactor	1200.0	960	0.2636

Equipment Classification: Tank

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Propane Tank	1005.3	603	0.2271
Tanks	22902.2	13741	3.9135
Total for Area:	25107.5	15304	4.4043
Total for Building:	124364.1	76363	40.9540

Building: Main Process Building

Area: Boiler

Equipment Classification: Equipment

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Amines Pump	12.0	6	0.0002
Boiler Feed Pump	6.7	3	0.0001
Boiler Feed Pump	6.7	3	0.0001
Boiler Feed Water Pump	12.0	6	0.0002
Breaching & Damper	640.0	640	0.0056
Brine Pump, 3/4 HP, Bronze, East	1.1	1	0.0000
Brine Pump, 3/4 HP, Bronze, West	1.1	1	0.0000
Brine Tank, 470 Gal. Fiberglass	62.8	38	0.0007
Deaerator	468.0	468	0.0032
Deaerator	424.1	424	0.0028
Emergency Oil Burner Pump	12.0	6	0.0002
Emergency Oil Burner Pump	12.0	6	0.0002
Hot Well Condensate Pump	6.7	3	0.0001
Hot Well Condensate Pump	6.7	3	0.0001
Hotwell Condensate Pump	12.0	6	0.0002
Hydrotest Water Transfer Pump	12.0	6	0.0002
Incinerator (in boiler room)	64.0	64	0.0008
Phosphate Feeder Assembly	6.2	6	0.0001
Phosphate Feeder Assembly Pump (Fee	12.0	6	0.0002
Potable Hot Water Recirculating Pum	12.0	6	0.0002
Steam Boiler (Package Unit)	2560.8	2049	0.0097
Steam Boiler (Package Unit)	2560.8	2049	0.0097
Zeolite Water Softener (Kisco), Wes	49.4	49	0.0006
Zeolite Water Softner (Kisco), East	49.4	49	0.0006

Equipment Classification: Tank

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Boiler Hotwell Tank	188.5	113	0.0017
Continuous Blowdown Tank	5.1	5	0.0001
Intermittent Blowdown Tank	117.8	71	0.0011
Zeolite Softener Tank	196.3	118	0.0016
Zeolite Softener Tank	113.1	68	0.0011
Total for Area:	7632.0	6273	0.0431

Building: Main Process Building

Area: De-Smoke House

Equipment Classification: Duct work

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Duct	0.5	0	0.0015
Total for Area:	0.5	0	0.0015

Building: Main Process Building

Area: Denitration, Reduction, Hydrofluorination

Equipment Classification: Bin

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
HF Recovery Discharge Bin	27.0	5	3.4574
HF-CUR UO2 Feed Bin "B" Line	2.3	0	1.5700
UF4 - UO2 Filter Bin	113.1	23	10.5601
UF4 Filter Seal Bin	90.0	18	9.2689
UF4 Seal Bin	84.8	17	6.6368
UO2 Filter Bin	84.8	17	8.5455
UO2 Seal Bin	54.0	11	5.7624
UO2 filter bin	36.0	7	5.7725
UO3 Feed Bin	36.0	7	3.4428
UO3 Storage Bin	252.0	50	12.5193
UO3 Surge Bin	180.0	36	12.2933
Uranium Dioxide Filter Bin	35.3	7	3.1955
Uranium Tetrafluoride Seal & Filter	18.8	4	2.9539
Uranium Tetrafluoride Seal Bin	84.8	17	8.5455
Uranium Tetrafluoride-Uranium Dioxi	113.1	23	8.6033
Uranium Trioxide Feed Bin	28.2	6	2.7041
Uranium Trioxide Storage Bin	2010.6	402	90.2409

Equipment Classification: Conveyor

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
1st Stage H.F. Reactor Feed Conveyo	0.9	1	0.5282
2nd Stage H.F. Reactor Feed Conveyo	0.2	0	0.1022
HF Reactor 1st Stage Feed Screw Con	1.3	1	0.7292
HF Reactor 2nd Stage Feed Screw Con	0.7	1	0.3484
UF4 Feed Bin Conveyor	3.1	3	1.7147
UF4 Filter Seal Bin Discharge Conev	3.1	3	1.7147
UF4 Filter Seal Bin Discharge Conve	0.5	1	0.3432
UF4 Filter Seal Bin Discharge Conve	1.9	2	1.0813
UF4 Purge Conveyor	2.3	2	0.8976
UF4 Seal Bin Discharge Conveyor	1.1	1	0.6595
UF4 Seal Bin Discharge Conveyor	1.7	2	0.9759
UO2 Filter Bin Discharge Conveyor	1.7	2	0.9759
UO2 Filter Bin Discharge Conveyor	1.9	2	1.3138
UO2 Reduction Reactor Feed Conveyor	1.5	2	0.8704
UO3 Bucket Elevator Feed Conveyor	3.9	4	1.4101

Building: Main Process Building

Area: Denitration, Reduction, Hydrofluorination

Equipment Classification: Conveyor

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
UO3 Elevator Feed Conveyor	25.0	25	8.3236
UO3 Feed Bin Conveyor	1.7	2	0.9303
UO3 Reduction Reactor Feed Conveyor	1.5	2	0.8704
UO3 Storage Bin Discharge Conveyor	1152.0	1152	54.8379
Uranium Trioxide Elevator Feed Scre	0.5	1	0.4169
Uranium Trioxide Feed Bin Screw Con	1.6	2	0.7167
Uranium Trioxide No. 4 & No. 5 Deni	52.0	52	13.4458
Uranium Trioxide Reclaim Screw Conv	25.0	25	8.3236
Uranium Trioxide Storage Bin Feed S	30.0	30	9.9556

Equipment Classification: Elevator

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
HF-CUR UO2 Elevator "B" Line	2.3	2	1.5700
HF-CUR UO2 Elevator Feeder "B" Line	6.2	6	2.1788
UF4 Bucket Elevator	40.0	12	50.2680
UO2 Screw Elevator (2nd Stage)	7.8	8	2.2158
UO2 Screw Elevator - 1st Stage	0.3	0	0.2370
UO2 Screw Elevator Feeder (1st Stag	1.3	1	0.7650
Uranium Trioxide Bucket Elevator	135.0	41	37.8404

Equipment Classification: Equipment

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
(Spare) UF4 Filter, Tube Sheet & Bu	113.1	113	10.7676
1st Stage HF Reactor Discharge Pipe	0.6	1	0.2830
260-CO-M-3332 Discharge Exp. Joint	1.1	1	0.4218
260-CO-M-3334 Discharge Exp. Joint	1.1	1	0.4020
2nd Stage HF Reactor Discharge Pipe	0.1	0	0.0766
AHF Heater	6.2	5	3.6941
AHF Heater	150.0	120	9.9111
AHF Superheater	141.3	141	14.6041
Air Sampling Compressor	27.0	16	4.0902
Ammonia Dissociator	480.0	288	28.2526
Ammonia Dissociator Package	480.0	288	28.2526

Building: Main Process Building

Area: Denitration, Reduction, Hydrofluorination

Equipment Classification: Equipment

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Ammonia Dissociator Package	480.0	288	28.2526
Bin Vent Baghouse	24.0	14	4.5698
Boildown Area Sump Pump	6.0	3	1.4086
Clean-Up Reactor Filter	42.4	42	5.7685
Collector	2112.0	1267	68.6377
Decon Hoist	21.2	13	3.2123
Denitration Ventilator	402.1	201	22.8440
Denitrator	504.0	504	44.0661
Denitrator	504.0	504	44.0661
Denitrator Area Hoist	32.0	19	5.2226
Denitrator No. 3	504.0	504	44.0661
Denitrator No. 4	504.0	504	44.0661
Denitrator Wet Scrubber	10.6	11	2.5958
Denitrator Wet Scrubber	216.0	216	20.5642
Denitrator Wet Scrubber	10.6	11	2.5958
Denitrator Wet Scrubber	10.6	11	2.5958
Exhaust Fan Reactor Area, 3rd Level	9.0	5	1.1294
Exhaust Fan Reactor Area, 4th Level	9.0	5	1.1294
Expansion Joint, 1st & 2nd Stage HF	96.0	96	4.5673
H.F. Reactor Cooling Air Blower	96.0	48	8.5972
H.F. Reactor Cooling Air Blower	12.0	6	2.5523
HF Back-up Filter	56.5	57	7.8314
HF Condenser Sub-Cooler	8.8	9	2.2908
HF Condenser Sub-Cooler	8.8	9	2.2908
HF Condenser Subcooler	10.6	11	2.7821
HF Condenser Subcooler	10.6	11	2.7821
HF Filter Maintenance Hoist	1.0	1	0.6122
HF-CUR Feeder "A" Line	3.1	3	1.1538
HF-CUR Feeder "B" Line	3.1	3	1.1538
HF-CUR Filter "A" Line	100.5	101	8.2036
HF-CUR Filter "B" Line	28.2	28	4.2303
HF-CUR Sample Condenser "A" Line	64.0	64	7.8339
HF-CUR Sample Filter "A" Line	4.7	5	1.6663
HFR Filter Tube Bundle Carrying Can	141.3	71	12.3058
HFR Filter Tube Bundle Carrying Can	141.3	71	12.3058
HNO3 Recycle Cooler	1.5	2	0.5026
Hydrofluorination Back-up Filter	62.8	63	7.6932

Building: Main Process Building

Area: Denitration, Reduction, Hydrofluorination

Equipment Classification: Equipment

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Hydrofluorination Reactor Cooling A	96.0	48	8.5972
Hydrofluorination Reactor Cooling A	96.0	48	8.5972
Internal Contamination of Equipment	0.0	0	117.0000
Nitric Acid Recycle Centrifugal Pum	4.5	2	1.1524
Purge Filter	139.4	139	15.6278
Reduction Reactor Off-Gas Back-Up F	35.3	35	3.9223
Reduction Reactor Off-Gas Back-Up F	117.8	118	10.8957
Reduction Reactor Outlet Exp. Joint	1.5	2	0.5272
Reduction Ventilator	402.1	241	22.8440
Screen Box on UO3 Storage Bin	2.0	2	0.9792
UF4 Gas Lift	2.3	1	1.2922
UF4 Gas Lift	9.4	9	2.6376
UF4 Gas Lift Fluidizer	0.1	0	0.0792
UF4 Hydrofluorination to Bucket Ele	20.0	4	6.6915
UF4 Purge Back-Up Filter	3.1	3	0.9053
UF4 Purge Gas Backup Filter	75.4	75	8.2036
UNH Boildown Condenser	19.4	19	4.5184
UNH Boildown Condenser	62.8	38	10.7676
UNH Boildown Entrainment Separator	42.4	42	5.7685
UNH Decanter #1	331.8	199	17.3239
UNH Decanter #2	331.8	199	17.3239
UNH Evaporator Condenser (Spare)	87.9	53	6.8534
UNH Vertical Pump	31.4	16	7.1778
UO2 Screw Elevator Feeder (2nd Stag	2.1	2	1.1868
UO3 Feed Bin, Nitrogen Filter	0.5	1	0.2665
UO3 Pulverizer	18.0	18	3.4273
Uranium Trioxide Elev. Feed Screw C	3.0	1	1.1424
Uranium Trioxide Elevator Feed Scre	3.0	1	1.1424
Uranium Trioxide Redler Conv./Elev.	3.0	1	1.1424
Uranium Trioxide Redler Conv./Elev.	1.5	1	1.0575
Uranium Trioxide Screen Box	6.0	6	1.6320
Vertical UNH Pump	40.8	20	7.1778
Vertical UNH Pump	40.8	20	7.1778

Building: Main Process Building

Area: Denitration, Reduction, Hydrofluorination

Equipment Classification: Reactor

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
1st Stage Hydrofluorination Reactor	282.7	170	15.6893
1st Stage Reduction Reactor	49.0	49	5.9348
2nd Stage Hydrofluorination Reactor	282.7	170	15.6893
2nd Stage Reduction Reactor	31.4	31	4.6425
HF-CUR "A" Line	150.8	90	14.3565
HF-CUR "B" Line	150.8	90	14.3565
Hydrofluorination Reactor, First St	282.7	170	15.6893
Hydrofluorination, Second Stage	282.7	170	12.7822
Reduction Reactor, First Stage	17.6	18	3.4026
Reduction Reactor, Second Stage	17.6	18	3.4026
Spare HF Reactor	100.5	60	10.2543

Equipment Classification: Tank

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
HF Filter N2 Bump Tank	29.4	29	4.9801
HNO3 Recycle Tank	282.7	283	19.9962
Nitric Acid Recycle Tank	24.7	25	4.4505
P.A. Bump tank to HF Back-up Filter	12.5	13	2.5639
UF4 Filter Bump Tank	37.7	38	6.6654
UF4-UO2 Filter Bin N2 Surge Tank -	28.2	28	4.2303
UNH Boildown Tank	1021.0	613	36.2070
UNH Boildown Tank	1021.0	613	36.2070
UNH Boildown Tank	1021.0	613	32.3260
UO2 Filter Bin N2 Bump Tank	12.5	13	2.5639
UO2 Filter Bin N2 Surge Tank	3.1	3	0.9497
Total for Area:	19589.4	12464	1513.9217

Building: Main Process Building

Area: Digestion

Equipment Classification: Conveyor

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Alumina Feed Conveyor	20.0	20	6.0601
Misc. Digest Roller Conveyor	112.5	34	39.0212

Equipment Classification: Equipment

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Adjustment Tank Agitator	3.0	2	0.3802
Adjustment Tank Agitator	3.0	2	0.3802
Adjustment Tank Pump	10.1	5	2.3279
Adjustment Tank Pump	10.1	5	2.3279
Aluminum Nitrate Day Tank Agitator	4.7	3	0.1837
Ammonium Sulfate Day Tank Pump	1.5	1	0.5836
Caustic Scrubber Pump	5.2	3	1.5150
Digester Feed Bin Chutes	25.1	5	1.2873
Digester Fume Scrubber Cooler	6.2	6	0.4660
Digester Fumes Jet Scrubber	0.8	1	0.1384
Digester Fumes Jet Scrubber Pump	2.0	1	0.8868
Digester Fumes Jet Scrubber Pump	2.0	1	0.8868
Digester Fumes Scrubber	127.6	128	3.4949
Digester Tank Agitator	3.0	2	0.3802
Digester Tank Agitator	3.0	2	0.3802
Digester Tank Agitator	3.0	2	0.3802
Digester Tank Pump	2.8	1	0.9977
Digester Tank Pump	2.8	1	0.9977
Digester Tank Pump Screen Box	0.5	1	0.4641
Digestion Area Seal Water Filter	1.1	1	0.7257
Digestion Area Sump Pump	10.1	5	2.3279
Digestion Area Ventilator	75.4	38	9.7181
Heater, Misc. Digest Area	12.0	10	3.1039
Heater, Misc. Digest Area	12.0	10	3.1039
Internal Contamination of Equipment	0.0	0	5.4000
Misc. Batch Digest Dischg. Pump	12.0	6	2.5127
Misc. Batch Digester Fume Jet Scrub	0.8	1	0.1384
Misc. Batch Digester Fumes Jet Scru	5.2	3	1.5150
Misc. Batch Digester Tank Agitator	1.1	1	0.1837
Misc. Digest Ventilation Fan	6.0	3	2.2171

Building: Main Process Building

Area: Digestion

Equipment Classification: Equipment

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Seal Water Filter	2.0	2	0.6961
Special Feed & Aluminum Nitrate Sol	4.5	2	1.3302

Equipment Classification: Tank

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Adjustment Tank	763.4	458	17.7565
Adjustment Tank	763.4	458	17.7565
Aluminum Nitrate Day Tank	117.8	71	5.0818
CCW Make-Up Condensate Tank #2	87.9	53	4.3046
Digest Area Leak Monitor Tank	117.8	71	5.0818
Digester Sump Tank	75.4	45	3.8262
Digester Tank	763.4	458	17.7565
Digester Tank	763.4	458	17.7565
Digester Tank	763.4	458	17.7565
Misc. Batch Digester Tank	212.0	127	7.5330
Misc. Digest Caustic Make-up Tank	62.8	38	3.3478
Special Feed Additions Mix Tank	117.8	71	5.0818
Total for Area:	5100.5	3074	219.5547

Building: Main Process Building

Area: F2

Equipment Classification: Equipment

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Cell Rework Area Roof Fan 42" Buffa	78.5	39	0.5253
Dip Tank Circulating Pump	12.0	6	0.1749
Ductwork Pressure Fan	28.2	14	0.2667
Ductwork Pressure Fan	28.2	14	0.2667
Electrolyte Blowcase	339.2	339	1.4548
Emeregncy Shower & Eye Wash Station	126.0	13	0.7975
Emeregncy Shower & Eye Wash Station	126.0	13	0.7975
Emergency Shower & Eye Wash Station	126.0	13	0.7975
Emergency Shower & Eye Wash Station	126.0	13	0.7975
F2 - Production Refrigeration Unit	35.3	35	0.1417
F2 Compressor	120.0	72	0.5737
F2 Compressor	120.0	72	0.5737
F2 Compressor	14.0	8	0.0832
F2 Compressor	251.3	151	0.6395
F2 Compressor Filter	100.5	101	0.2906
F2 Compressor Filter	100.5	101	0.2906
F2 Compressor Oil Pump	12.0	6	0.0786
F2 Plant Plenum Fan	28.2	14	0.1199
F2 Recycle Cooler	25.1	25	0.1308
F2-HF Condensing Package	84.8	85	0.2943
Fluorine Building Heating & Ventila	240.0	120	1.2143
Fluorine Building Heating & Ventila	240.0	120	1.2143
Fluorine Building Roof Exhauster	117.8	59	0.6870
Fluorine Building Roof Exhauster	117.8	59	0.6870
Fluorine Building Roof Exhauster	117.8	59	0.6870
Fluorine Building Roof Exhauster	117.8	59	0.6870
Fluorine Cell Cooling Water Exchang	5.3	5	0.0674
Fluorine Cell Cooling Water Pump	12.0	6	0.0786
Fluorine Cell Cooling Water Steam H	5.3	4	0.0674
Fume Exhaust Fan	120.0	60	0.8438
H2 Filter	100.5	101	0.2906
H2 Filter	100.5	101	0.2906
H2 Recycle Cooler	37.7	38	0.1889
H2, HF Condenser Pump	12.0	6	0.0786
H2, HF Condenser Pump	12.0	6	0.0786
H2-HF Condensing Package	14.0	14	0.0832
Head Turnover Fixture	375.0	188	1.8009

Building: Main Process Building

Area: F2

Equipment Classification: Equipment

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Heating & Ventilating Unit	240.0	120	1.2143
Heating & Ventilating Unit	240.0	120	1.2143
Heating & Ventilating Unit	240.0	120	1.2143
Heating & Ventilating Unit	240.0	120	1.2143
KHF2 Powder Hopper	117.8	59	0.3088
Pump	3.1	2	0.0727
Pump	3.1	2	0.0727
Roof Exhauster	117.8	59	0.3088
Roof Exhauster	117.8	59	0.3088
Roof Exhauster	117.8	59	0.3088
Roof Exhauster	117.8	59	0.3088
Waste Gas Burner	131.9	66	0.8082
Waste Gas Scrubber	3141.6	3142	7.2745
Waste HF Cooler	77.7	78	1.0851

Equipment Classification: Tank

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
1360 Gal. Sulfuric Acid Tk. #2 Fluo	530.1	318	2.5460
50% Liquid Caustic Storage Tank	424.1	254	1.7458
AHF Drain Tank	35.3	35	0.6652
AHF Drain Tank	25.1	25	0.6141
Electrolyte Make-Up Tank	226.2	136	1.8423
F2 Surge Tank	402.1	241	5.1856
Gaseous Refrigerant Storage Tank	1800.0	1080	11.0768
H2 Surge Tank	392.7	236	3.8381
HF Refrigerant Expansion Tank	84.8	51	1.3816
Head and Shell Dip Tank	1350.0	810	8.7962
NaHS Storage Tank	751.6	451	2.3869
Nitrogen Bump Tank	35.3	35	0.6652
Sulfuric Acid Storage Tank (Fluorid	226.1	136	1.0669
Total for Area:	14818.0	10012	75.6691

Building: Main Process Building

Area: Fluorination

Equipment Classification: Bin

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
10 Day UF4 Storage Bin	304.0	61	10.3448
Ash Bypass Screener Feed Bin	36.0	7	3.3143
Ash Pulverizer Feed Bin	36.0	7	3.3143
CUR Discharge Bin	105.0	21	7.1309
CUR Discharge Bin "A" Line	200.0	40	10.5457
CUR Feed Bin	20.0	4	1.3558
CUR Tower #1 Feed Bin (072)	128.0	26	8.0348
Cleanup Reactor Feed Bin	18.0	4	2.1091
F2 Reactor Feed Conveyor with Bin	120.0	24	4.6325
F2 Reactor Feed Conveyor with Bin	120.0	24	4.6325
F2 Reactor Feed Conveyor with Bin	120.0	24	4.6325
F2 Tower #1 Feed Bin	128.0	26	8.0348
F2 Tower #2 Feed Bin	128.0	26	8.0348
F2 Tower #3 Feed Bin	128.0	26	8.0348
Fluorination Feed Bin	120.0	24	4.6325
Fluorination Feed Bin	120.0	24	4.6325
UF4 Storage Bin	508.9	102	9.9391

Equipment Classification: Conveyor

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Ash Grinding Discharge Conveyor	10.0	10	2.1091
CUR Discharge Bin Discharge Conveyo	6.0	6	1.3056
CUR Screw Conveyor	8.0	8	0.8537
CUR Screw Conveyor	3.0	3	0.9541
CUR Screw Conveyor	16.0	16	1.3841
Clean Up Reactor Discharge Bin Conv	20.0	20	4.1178
Clean-Up Reactor Cooling Screw Con	16.0	16	1.3056
Clean-Up Reactor Feed Conveyor with	128.0	128	8.0348
Fluorination Screw Conveyor	6.0	6	0.9039
Fluorination Screw Conveyor	6.0	6	0.9039
Recycle Ash Conveyor	5.0	5	1.1047
UF4 Bucket Elevator Feed Conveyor f	12.0	12	2.5108
UF4 Distribution Conveyor	109.5	33	10.7236
UF4 Storage Bin Discharge Conveyor	1.5	2	0.5021
UF4 from Bucket Elevator Conveyor	20.0	20	4.1178

Building: Main Process Building

Area: Fluorination

Equipment Classification: Elevator

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
UF4 Bucket Elevator	400.0	120	30.9342
UF4 Screw Elevator	0.7	1	0.1257

Equipment Classification: Equipment

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
10 Day Spreader Screw (old number w	15.7	16	3.2340
10-Day UF4 Discharge	4.9	5	1.9916
3 Day UF4 Storage Bin Discharge, Ro	24.0	24	1.4688
511 Chute	1.5	1	0.5021
511 Chute	1.5	1	0.5021
511 Chute	1.5	1	0.5021
511 Chute	1.5	1	0.5021
511 Chute	1.5	1	0.5021
Ash Bypass Screener	24.0	17	2.6113
Ash Dumper	36.0	25	3.3143
Ash Jaw Crusher	18.0	18	2.1091
Ash Pulverizer	12.0	12	1.6069
Ash Receiver	28.2	28	2.6032
Ash Receiver	28.2	28	2.6032
Ash Receiver	28.2	28	2.6032
Ash Receiver	28.2	28	2.6032
Ash Receiver	28.2	28	2.6032
Ash Receiver	28.2	28	2.6032
Ash Receiver	28.2	28	2.6032
Ash Receiver	28.2	28	2.6032
Ash Receiver	28.2	28	2.6032
Ash Receiver	28.2	28	2.6032
Ash Receiver	28.2	28	2.6032
Ash Receiver	28.2	28	2.6032
Ash Receiver	28.2	28	2.6032
Ash Receiver	28.2	28	2.6032
Baffle Mixing Box, F2 Clarifier Dis	48.0	48	4.4191
CUR Cold Trap #5	135.0	81	5.5930
CUR Cold Trap #6	156.0	94	5.8189
CUR Screen Box	0.3	0	0.2199
Clean-Up Reactor Back-Up Filter	2.5	3	4.4171

Building: Main Process Building

Area: Fluorination

Equipment Classification: Equipment

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Clean-Up Reactor Ejector	18.0	18	2.1091
Clean-Up Reactor Recycle Blower	12.0	6	1.6069
Console	30.0	15	3.1135
Emergency Exhaust Fan	64.0	32	2.4104
Exhaust Fan	6.2	3	0.2344
F2 Reactor Back-up Filter	34.3	34	1.8304
F2 Reactor Ejector	28.2	28	2.6032
F2 Reactor Ejector	0.5	1	0.2566
F2 Reactor Ejector	0.5	1	0.2566
F2 Reactor Filter	0.5	1	0.2566
Facility Audio System	16.0	16	1.0043
Fluorination Area Sump Pump at Col.	12.0	6	1.7074
Fluorination Ash Receiver Hood	6912.0	1382	130.1646
Fluorination Back-Up Filter	34.3	34	1.8304
Fluorination Reactor Filter, No. 4	110.6	111	7.3162
Fluorination Reactor Filter, No. 5	110.6	111	7.3162
Fluorination Reactor Primary Cyclon	47.7	48	3.9044
Fluorination Reactor Primary Cyclon	47.7	48	3.9044
Fluorination Screen Box	0.3	0	0.2199
Fluorination Screen Box	0.3	0	0.2199
Fluorine Heater	48.0	38	2.2095
Fluorine Heater	60.0	48	2.6113
Fluorine Reactor Ash Receiver Clamp	81.5	82	6.2270
Gantry Crane on Roof	3920.0	3136	37.9647
HF Scrubber Recycle Cooler	175.9	176	10.0968
HP Breathing Air Compressor	120.0	120	3.7161
Heat Pump Air Conditioning Unit - S	39.2	39	1.7749
Heat exchangers	120.0	120	14.9398
Hoist for Moving Ash Receivers to A	18.0	11	2.1091
Internal Contamination of Equipment	0.0	0	0.7000
No. 1 Boildown Ventilator	75.4	45	2.5242
No. 1 F2 Tower Cyclone	47.7	48	3.9044
No. 1 F2 Tower Filter Cyclone	110.6	111	7.3162
No. 1 F2 Tower Ventilator	75.4	45	2.5242
No. 2 Boildown Ventilator	75.4	45	2.5242
No. 2 F2 Tower Cyclone	35.3	35	3.0763
No. 2 F2 Tower Filter	62.8	63	4.4171

Building: Main Process Building

Area: Fluorination

Equipment Classification: Equipment

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
No. 3 Boildown Ventilator	75.4	45	2.5242
No. 3 Electric Room Ventilator	180.0	108	4.8209
No. 3 F2 Tower Cyclone	35.3	35	3.0763
No. 3 F2 Tower Filter	62.8	63	4.4171
No. 3 F2 Tower Ventilator	75.4	45	2.5242
No. 5 F2 Tower Ventilator	75.4	45	2.5242
Plant Dust Collector Baghouse	5400.0	3240	49.7156
Plant Dust Collector Branch Blower	27.0	14	1.1299
Primary Cold Trap	412.5	413	10.4515
Primary Cold Trap	412.5	413	10.4515
Primary Cold Trap	412.5	413	10.4515
Primary Cold Trap #4	412.5	413	10.4515
Primary Cold Trap Heater	12.5	10	0.8875
Primary Cold Trap Heater	28.2	23	2.6032
Primary Cold Trap Heating Pump	12.0	6	1.7074
Primary Cold Trap Refrigeration Uni	108.0	108	3.6910
Primary Cold Trap Refrigeration Uni	1008.0	1008	18.3044
Primary Cold Trap STand-by & Refrig	12.0	6	1.7074
Primary Cold Trap Stand-by & Refrig	12.0	6	1.7074
Primary Cold Trap Tempering Heat Ex	1.5	2	0.2824
Primary Cold Trap Tempering Pump	12.0	6	1.7074
Process Area Air Handling Unit	768.0	384	12.8557
Redler 510 Ventilator	402.1	201	7.5726
Reduction Area Ventilator	402.1	201	7.5726
Refrigeration Primary Cold Trap Pum	6.0	3	0.6496
Refrigeration Standby Primary Cold	6.0	3	0.6496
Scale	168.0	118	12.4540
Secondary Cold Trap	135.0	81	5.5930
Secondary Cold Trap	135.0	81	5.5930
Secondary Cold Trap	135.0	81	5.5930
Secondary Cold Trap Freon Heater	6.0	5	1.1047
Secondary Cold Trap Off-Gas Blower	12.0	6	1.6069
Secondary Cold Trap Off-Gas Blower	24.0	24	1.4688
Secondary Cold Trap Refrig. & Stand	9.0	5	1.4312
Secondary Cold Trap Refrig. & Stand	9.0	5	1.4312
Secondary Cold Trap Refrigeration U	1680.0	1344	42.9864
Secondary Cold Trap Tempering Heat	3.5	4	0.3254

Building: Main Process Building

Area: Fluorination

Equipment Classification: Equipment

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Secondary Cold Trap Tempering Pump	9.0	5	1.4312
Sludge Pit Pump	12.0	6	0.0352
Spare F2-HF Condenser	84.8	51	0.1317
Spare F2-HF Exchanger	572.5	344	0.3953
Spare Fluorination Reactor Tower	15.7	16	3.2340
Surge Tank for F2 Reactor Filter	28.2	28	2.6032
Surge Tank for F2 Reactor Filter	28.2	28	2.6032
Surge Tank for F2 Reactor Filter	16.0	16	2.0087
Tempering Water Heater	3.5	3	0.3254
UF4 Bin Vent Dust Collector	64.0	19	5.6244
UF4 Bucket Elevator Feeder	20.0	4	4.1178
UF4 Feed Conveyor to 1336 from CO-3	6.0	6	1.3056
UF4 Vacuum System Exhauster	54.0	32	2.2598
UF4 Vacuum System Primary Cyclone	565.4	339	10.8857
UF4 Vacuum System Secondary Cyclone	565.4	339	10.8857
UF6 Compressor	40.0	40	2.1468
UF6 Compressor	40.0	40	2.1468
UF6 Recycle Cooler	3.5	4	0.3660
UO2 Filter Tube Reclaimer	3.9	4	2.9580
UO3 Vacuum System Primary Cyclone D	20.0	20	2.0589
UO3 Vacuum System Secondary Cyclone	20.0	20	2.0589

Equipment Classification: Reactor

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Clean-Up Reactor	21.2	21	1.5085
Clean-Up Reactor	14.1	14	1.0352
Fluorination Reactor	36.0	36	4.0174
Fluorination Reactor	36.0	36	4.0174
Fluorination Reactor	48.0	48	5.2226
Fluorination Reactor	48.0	48	5.2226
Fluorination Reactor	48.0	48	5.2226

Building: Main Process Building

Area: Fluorination

Equipment Classification: Tank

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Decon Acid Dip Tank	160.0	96	4.8209
Hydrotest Water Storage Tank	117.8	71	3.3525
Refrigerant Storage Tank	96.2	58	3.6495
Refrigerant Storage Tank	96.2	58	3.6495
Refrigerant Transfer Tank	8.0	8	0.6026
Refrigerant Transfer Tank	530.1	318	12.4238
Refrigerant Transfer Tank	530.1	318	12.4238
Secondary Cold Trap - Blowdown Tank	12.5	13	1.5778
Secondary Cold Trap Expansion Tank	12.5	13	0.7889
Secondary Cold Trap Expansion Tank	12.5	13	0.7889
Soda Ash Mix Tank	28.2	28	1.3016
UF6 Emergency Dump Tank	215.9	130	5.9901
Ultra Sonic Cleaning Tank	128.0	77	4.0174
Total for Area:	33572.1	19435	924.5535

Building: Main Process Building

Area: Main Process Building

Equipment Classification: Equipment

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
13KV Manhole Sump Pump	12.0	6	0.2561
Exhaust Fan	36.0	18	0.2462
Exhaust Fan	36.0	18	0.2462
Exhaust Fan	36.0	18	0.2462
Exhaust Fan	36.0	18	0.2462
Exhaust Fan	36.0	18	0.2462
Exhaust Fan	36.0	18	0.2462
Exhaust Fan	36.0	18	0.2462
Exhaust Fan	36.0	18	0.2462
Exhaust Fan	36.0	18	0.2462
Exhaust Fan	36.0	18	0.2462
Exhaust Fan	36.0	18	0.2462
Exhaust Fan	36.0	18	0.2462
Exhaust Fan	36.0	18	0.2462
Exhaust Fan	36.0	18	0.2462
Heating & Ventilating Unit	1728.0	864	6.6890
Heating & Ventilating Unit	768.0	384	3.8567
Heating & Ventilating Unit	768.0	384	3.8567
Heating & Ventilating Unit	768.0	384	3.8567
Heating & Ventilating Unit	768.0	384	3.8567
Heating & Ventilating Unit	1152.0	576	5.4235
Heating & Ventilating Unit (Slurry	96.0	48	0.9641
Ice Machine for UF6 Drain Station	120.0	96	1.1148
Plant Dust Collector Blower	480.0	240	2.9528
UF6 Weigh Scale	288.0	202	2.1694
Unit Heater	12.0	10	0.1566
Unit Heater	12.0	10	0.1566
Unit Heater	12.0	10	0.1566
Unit Heater	12.0	10	0.1566
Unit Heater	12.0	10	0.1566
Unit Heater	12.0	10	0.1566
Unit Heater	12.0	10	0.1566
Unit Heater	12.0	10	0.1566
Unit Heater	12.0	10	0.1566
Unit Heater	12.0	10	0.1566
Unit Heater	12.0	10	0.1566
Unit Heater	12.0	10	0.1566

Building: Main Process Building

Area: Main Process Building

Equipment Classification: Equipment

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Unit Heater	12.0	10	0.1566
Unit Heater	12.0	10	0.1566
Unit Heater in Decon Room	12.0	10	0.1566
Wall Exhauster	13.5	7	0.2711
Washer/Extractor	432.0	432	1.0847
Total for Area:	8077.5	4409	42.1503

Building: Main Process Building

Area: Maintenance

Equipment Classification: Equipment

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
AC Unit for HP Maint. Office, Break	64.0	38	0.3193
Air receiver	75.4	75	0.3344
Ash elevator	800.0	320	2.5284
Ash grinding area	2340.0	1170	3.7062
Ash receiver de-smoke house	900.0	450	1.8630
Blowcase	180.0	180	0.7186
Circulation pump	18.0	9	0.1796
Decon Facility Ammonium Oxylate EX-	64.0	32	3.4549
Degreaser	126.0	126	0.5190
Drill press	72.0	58	0.3593
Dust Collector (Bag Type)	773.1	155	1.6657
Dust collector	900.0	180	2.0959
Dust collector blower	750.0	375	1.7300
Dust collectors (5)	135.0	27	0.5289
Dust separator	215.9	43	0.7055
Emergency Exhaust Fan	36.0	18	1.1818
Emergency Exhaust Fan	36.0	18	1.1818
Empty Drum Scale (Dial & Printer)	64.0	45	0.2927
Exhauster	187.5	94	0.6653
Freon vaporizer	165.0	165	0.7219
Heliarc	156.0	156	0.7718
Hot well	390.0	390	1.1511
Hydrapress	72.0	72	0.3593
Lathe	180.0	180	0.7186
No. 2 mill	180.0	180	0.6387
Radial drill	192.0	192	0.6920
SS decon table	168.0	34	0.6454
Seal wt pump	36.0	18	0.2195
Sludge pit pump	18.0	18	0.1796
Sump	24.0	24	0.1863
Table	96.0	19	0.4258
Table	204.0	41	0.7252
Vapor blast	192.0	192	0.6920
Ventilation Fan	8.0	4	0.8637
Water treatment equipment 1	294.0	294	1.0246
Water treatment equipment 2	120.0	120	0.4923
Water treatment equipment 3	432.0	432	1.1976

Building: Main Process Building

Area: Maintenance

Equipment Classification: Equipment

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Welding table	216.0	43	0.7585
Work bench	126.0	25	0.5389
Work bench	180.0	36	0.6387
Work benches (2)	72.0	14	0.3992
Work table (2)	192.0	38	0.6920

Equipment Classification: Tank

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Alum Feed Tank - with Pump & Agitat	6.2	6	0.0159
Dip tank	480.0	288	1.3706
Foam tanks (2)	75.4	45	0.3344
H2 tank	576.0	346	1.7566
HNO3 tank	144.0	86	0.5988
Hydropneumatic tank	855.0	513	2.0061
Seal wt tank	42.4	42	0.2351
Total for Area:	13629.1	7426	45.0829

Building: Main Process Building

Area: Miscellaneous

Equipment Classification: Equipment

Description		Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
H Burner		323.5	162	0.1023
	Total for Area:	323.5	162	0.1023

Building: Main Process Building

Area: Sampling Plant

Equipment Classification: Bin

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Digester Feed Bin	375.0	75	5.0641
Digester Feed Bin	375.0	75	5.0641
Primary Sample Reject Bin	9.4	2	0.4501
Redrumming Bin	37.7	8	1.1253
Yellowcake Sample Collection Bin	12.5	3	0.5627
Yellowcake Sample Weight Bin	11.0	2	0.5063

Equipment Classification: Conveyor

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Bucket Elevator Feed Conveyor	40.0	40	1.9343
Conveyor (miscellaneous digest)	275.0	55	13.8810
Cyclone Discharge Conveyor	37.5	38	0.5462
Digester Feed Conveyor #1	42.0	42	1.9702
Digester Feed Conveyor #2	42.0	42	1.9702
Digester Feed Transfer Conveyor	36.0	36	2.0060
Dust Collector Conveyor (Sampling P	2880.0	576	22.3529
Dust collector discharge conveyor	5.0	5	0.5552
Empty Drum Elevator Storage Conveyo	30.0	6	2.6239
Empty Drum Scale Storage Conveyor	30.0	6	2.6239
Empty Drum Scale Transfer Conveyor	3.7	1	0.3671
Empty Drum Storage Conveyor	40.0	8	3.4836
Full Drum Dumper Storage Conveyor	30.0	6	2.6239
Full Drum Elevator Feed Conveyor	15.0	15	1.3343
Full Drum Receiving Conveyor	37.5	8	3.2687
Full Drum Scale Transfer Conveyor	5.0	1	0.4746
Redrum Dumper Conveyor	4320.0	864	30.9502
Redrum Scale Transfer Conveyor	5.0	1	0.4746
Redrum Transfer Conveyor	3.7	1	0.3671
Scale Transition Conveyor	3.7	1	0.3671

Equipment Classification: Elevator

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Bucket elevator	40.0	12	2.9015

Building: Main Process Building

Area: Sampling Plant

Equipment Classification: Elevator

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Redrum Dumper Elevator	240.0	48	4.8718
Yellowcake Bucket Elevator	156.0	47	7.5584
Yellowcake Drum Elevator	1504.0	301	21.3499

Equipment Classification: Equipment

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
	2.1	2	0.3164
ADU Receiving Pump	12.0	6	0.6089
ADU Slurry Heater	4.7	4	0.3657
ADU Transfer Pump	12.0	6	0.6089
Bin Vibrator	0.2	0	0.0492
Bin Vibrator	0.2	0	0.0492
Bin Vibrator	0.2	0	0.0351
Bin Vibrator	0.2	0	0.0351
Bin Vibrator	0.2	0	0.0351
Bin Vibrator	0.2	0	0.0351
Bin Vibrator	0.2	0	0.0492
Bin Vibrator	0.2	0	0.0492
Bin Vibrator	0.2	0	0.0351
Bin Vibrator	0.2	0	0.0351
Bucket Elevator Feed Chute	8.0	2	0.6089
Bucket Elevator Split Chute	10.0	2	0.7522
Drum Cleaning Mechanism	70.6	71	1.9411
Drum Dumper Split Chute	22.0	4	1.6119
Drum Dust Cover Removal Mechanism	6.0	6	0.5731
Dust Collector Blower (Sampling Pl	256.0	128	1.7194
Dust Collector Blower Base	0.5	1	0.1074
Dust Collector and By-Pass Chute	5.2	1	0.7612
Filler Head Assembly	3.5	4	0.3376
Full Drum Scale (Dial & Printer) an	64.0	45	1.5761
Gear Reducer for Sample Stirrer	10.0	10	0.5015
Hoist, with jib 1 ton	3.6	1	0.5283
Internal Contamination of Equipment	0.0	0	18.2000
Misc. Digester Feed Bin Chute	2.0	1	0.2955
Primary Cyclone	70.6	42	1.9411

Building: Main Process Building

Area: Sampling Plant

Equipment Classification: Equipment

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Redrum Scale	64.0	45	1.5761
Sample Plant D.C. Compressor Air Dr	6.0	6	0.3940
Sampling Area Hoist 5 ton	14.0	13	0.7701
Sampling Plant Dust Collector Blowb	72.0	72	1.9343
Screen Over Size Discharge Pipe	4.3	4	0.6259
Secondary Cyclone	150.8	90	3.1510
Transition Piece	0.1	0	0.0211
Transition Piece	1.1	1	0.1124
Transition Piece	0.1	0	0.0211
UO3 Cyclone on Vacuum System	196.3	118	3.5168
Unit Heater	15.0	12	1.3075
Unit Heater	0.6	1	0.1074
Vacuum Cleaner (Stationary)	768.0	461	10.8899
Vacuum Producer Base	4.5	5	0.4298
Yellowcake Drum Dumper with Rapper	156.0	62	4.1553
Yellowcake Primary 1st Stage Sample	3.7	4	0.3671
Yellowcake Primary Sampler (1st Sta	40.0	24	1.3612
Yellowcake Primary Sampler (2nd Sta	36.0	22	1.2895
Yellowcake Screening Feeder	2.0	2	0.2328
Yellowcake Secondary Sampling Stati	132.0	79	2.8299

Equipment Classification: Tank

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
ADU Tank 1,000 gal.	1256.6	754	11.8164
ADU Tank 1,000 gal.	151.8	91	3.2970
ADU Tank 1,000 gal. (East)	1256.6	754	11.8164
Total for Area:	15539.4	5281	239.4192

Building: Main Process Building

Area: Utility Shop

Equipment Classification: Equipment

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Air Compressor (with Filter & After	42.0	25	0.0694
Air Compressor (with Filter & After	42.0	25	0.0694
Air Compressor After Cooler	2.3	2	0.0163
Air Compressor After Cooler	2.3	2	0.0163
Air Compressor Aftercooler	2.3	2	0.0163
Air Compressor Mist Eliminator	9.4	9	0.0332
Air Dryer	10.0	7	0.0567
Air Dryer	10.0	7	0.0567
Air Dryer	79.0	55	0.0999
Air Mist Eliminator (Branch)	1.1	1	0.0326
Air Mist Eliminator (Branch)	1.1	1	0.0326
Air Mist Eliminator (Main Flow)	1.1	1	0.0326
Air Receiver	150.8	151	0.1490
Batt char lube	126.0	126	0.5389
Breathing Air Receiver UF6 Plant	190.8	115	0.1707
Breathing Air, 1040 Sulair Compress	36.0	22	0.0610
Control panel (2)	62.1	31	0.1099
Control panel 1	516.0	258	0.6033
Control panel 2	480.0	240	0.5626
Cooling Water (Emergency) Pump	8.0	4	0.0237
Cooling Water (Emergency) Pump	8.0	4	0.0237
Delmonox Unit (815-W13) 100 CFM	24.0	24	0.0576
Emergency Cooling Water Pump	8.0	4	0.0237
Emergency Power Generator	269.5	270	0.2372
F2 Cell Cooling Water Pump	18.0	9	0.0372
F2 Cell Cooling Water Pump	18.0	9	0.0372
Fire Water Jockey Pump (Replace 160	5.2	3	0.0173
Fire Water Pump (Diesel Oil Engine	150.0	75	0.1610
Fire Water Pump (Electric Driven)	35.0	18	0.0694
Jockey Fire Pump	12.0	6	0.0288
Potable Water Pump	6.0	3	0.0194
Potable Water Pump	6.0	3	0.0194
Potable Water Rapid Gravity Sand Fi	1300.6	1301	0.5590
Potable Water Rapid Gravity Sand Fi	1809.5	1810	0.4472
Potable Water Sand Filter Pump	6.0	3	0.0194
Potable Water Sand Filter Pump	6.0	3	0.0194
Press. Sand Filter, Sanitary Waste	35.3	35	0.0519

Building: Main Process Building

Area: Utility Shop

Equipment Classification: Equipment

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Refrigerated Air Dryer	60.0	30	0.0796
Storage Tank Fill Pump	6.0	.3	0.0194

Equipment Classification: Tank

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Coagulant Aid Feed Tank - with pump	69.1	41	0.1224
Fire Foam Tank (East)	50.2	30	0.0638
Fire Foam Tank (West)	50.2	30	0.0638
New SS Hydropneumatic Tank	731.2	439	0.4193
Total for Area:	6456.9	5237	5.3507

Building: Main Process Building

Area: Waste System

Equipment Classification: Duct work

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Plant Dust Collection Duct	0.2	0	0.0044
Plant Dust Collection Duct	0.2	0	0.0061
Plant Dust Collection Duct	0.3	0	0.0067
Plant Dust Collection Duct	0.5	0	0.0104
Plant Dust Collection Duct	0.5	0	0.0118
Plant Dust Collection Duct	0.8	0	0.0190
Plant Dust Collection Duct	0.9	0	0.0200
Plant Dust Collection Duct	1.2	0	0.0271
Plant Dust Collection Duct	1.4	0	0.0303
Plant Dust Collection Duct	1.5	0	0.0307
Plant Dust Collection Duct	1.9	0	0.0385
Plant Dust Collection Duct	2.4	0	0.0532
Plant Dust Collection Duct	3.1	1	0.0626
Plant Dust Collection Duct	5.8	1	0.1212
Plant Dust Collection Duct	7.3	1	0.1490

Equipment Classification: Equipment

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Absorber	4199.6	4200	0.0890
Aqueous HF Sump Pump	106.0	53	0.0260
Discharge	6.0	6	0.0011
Discharge	6.0	6	0.0011
Ejector	17.2	17	0.0010
F2 & H2 Waste Gas Burner	565.4	283	0.0208
Fluoride Sludge Basin No. 2, Sump P	12.0	6	0.0017
Gas Cooler	70.6	71	0.0027
HF Clean-up System Exhaust Fan	60.0	30	0.0047
HF Clean-up System Exhaust Fan	60.0	30	0.0047
HNO3 Absorber NO2	314.1	188	0.0170
HNO3 Absorber Recovery Pump	12.0	6	0.0017
HNO3 Absorber Sump Pump	12.0	6	0.0017
HNO3 Steam Ejector	9.4	9	0.0009
HNO3 Steam Ejector	4.6	5	0.0008
NOX Chemical Scrubber	855.6	513	0.0363
NOX Chemical Scrubber	640.6	384	0.0277

Building: Main Process Building

Area: Waste System

Equipment Classification: Equipment

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
NOX Exhaust Blower	3.0	3	0.0007
NOX Quencher-Scrubber	212.2	212	0.0143
NOx (ec) 1st & 2nd Stage Chemical S	848.2	509	0.0312
NOx (ec) 1st Stage Recirculation Pu	12.0	6	0.0017
NOx (ec) 2nd Stage Recirculation Pu	12.0	6	0.0017
NOx (ec) 3rd Stage Chemical Scrubbe	848.2	509	0.0312
NOx (ec) 3rd Stage Recirculation Pu	12.0	6	0.0017
NOx (ec) Caustic Recirculation Pump	12.0	6	0.0017
NOx (ec) Caustic Recirculation Pump	12.0	6	0.0017
NOx (ec) Exhaust Blower (5000 cfm)	288.0	144	0.0132
NOx (ec) Quencher Recirculation Pum	12.0	6	0.0017
NOx (ec) Sump Pump	12.0	6	0.0017
NOx (ec) Waste Liquid Sump Pump	12.0	6	0.0017
Nitric Acid Absorber	9.4	9	0.0009
Nitric Acid Absorber Compressor	9.4	9	0.0009
Nitric Acid Absorber Water Cooler	9.4	9	0.0009
Nitric Acid Absorber Water Cooler	314.1	188	0.0085
Nitric Acid Recovery Feed Pump	12.0	6	0.0017
Nitric Acid Recovery Gas Cooler	0.9	1	0.0002
Nitric Acid Recovery Pump	12.0	6	0.0017
Nitric Acid Recovery Steam Ejector	27.0	27	0.0013
Nitric Acid Recovery Steam Ejector	4.6	5	0.0008
Nitric Acid Recovery System Steam E	0.9	1	0.0004
Phosphates Pump to Boiler #002	12.0	6	0.0017
Plant Stack Gas Fan (Sample)	314.1	157	0.0085
Reduction Hydrogen Burner	1005.3	503	0.0302
Scrubber Recirculation and Disposal	12.0	6	0.0017
Scrubber Recirculation and Disposal	12.0	6	0.0017
Sulfuric Acid Pump (Fluoride Clarif	12.0	6	0.0017
Waste Gas Quencher	117.8	118	0.0067
Waste Gas Scrubber	289.0	289	0.0157
Waste Scrub Liquid Cooler	12.0	12	0.0017
Water Cooler	1.7	2	0.0004

Building: Main Process Building

Area: Waste System

Equipment Classification: Tank

Description		Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Aqueous HF Sump Tank		12.0	12	0.0017
Feed Tank		49.4	49	0.0040
NOX Caustic Mix Tank		73.6	44	0.0049
NOX Recirculation Tank		73.6	44	0.0049
NOX Recirculation Tank		73.6	44	0.0049
NOX Recirculation Tank		73.6	44	0.0049
NOx (ec) 1st Stage Recirculation Ta		301.6	181	0.0126
NOx (ec) 2nd Stage Recirculation Ta		301.6	181	0.0126
NOx (ec) 3rd Stage Recirculation Ta		301.6	181	0.0126
NOx (ec) Caustic Mix Tank		98.1	59	0.0029
NOx (ec) Waste Liquid Sump Tank		301.6	181	0.0126
Raffinate Storage Tank		282.7	170	0.0123
Sodium Hydro Sulfide (NaHS) Storage		1963.5	1178	0.0236
Sulfuric Acid Storage Tank (Main Su		0.9	1	0.0002
	Total for Area:	15372.1	10976	1.1388
	Total for Building:	140111.4	84749	3066.9884

Building: Miscellaneous Digest

Area: Miscellaneous Digest

Equipment Classification: Bin

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Alumina Bin	1400.0	280	27.1567
Misc. Digester Feed Bin	15.7	3	1.3471
Misc. Digestor Bin	441.7	88	11.5766

Equipment Classification: Elevator

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Misc. Digest Drum Elevator	281.2	56	14.4048

Equipment Classification: Equipment

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Air Bump Tank Misc. Digest Dust Col	15.7	16	1.3471
Ammonium Sulfate Duo-Filter Unit	24.0	24	1.8580
Caustic Scrubber	8.8	9	0.9683
Digest Seal Water Pump	12.0	6	1.2149
Misc. Batch Digester Fume Scrubber	6.2	6	0.6735
Misc. Batch Digester Fumes Scrubber	127.6	128	5.0515
Misc. Digest Drum Tipper/Dumper	35.0	21	2.3404
Misc. Digest Rotary Tooth Crusher	100.5	101	4.4901
Misc. Digest Scrubber Exchanger #1	10.6	11	1.1366
Misc. Digest Scrubber Exchanger #2	10.6	11	1.1366
Misc. Digest Solid Material Chopper	16.0	16	1.7151
Recycle Pump	12.0	6	1.2149
Twin Screw Feeder @ Misc. Digest	24.0	24	4.2792
Vacuum System Compressor	12.0	12	1.1434

Equipment Classification: Tank

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Digest Seal Water Tank	117.8	71	4.7710
Total for Area:	2671.7	889	87.8265

Building: Miscellaneous Digest

Area: Miscellaneous Digest

Total for Building:	2671.7	889	87.8265

Building: Raffinate

Area: Raffinate

Equipment Classification: Equipment

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
3"x2" Durco Portable Pump @ Clarifi	12.0	6	0.1778
Ammonium Nitrate Storage Pond Pump	12.0	6	0.1778
Barge Sludge Pump Pond 2 Vaughan	12.0	6	0.1778
Catchment Trench Pump #4	12.0	6	0.1778
Centrifuge Feed Pump	12.0	6	0.1778
Dewatering Tank Pump	72.0	36	0.5649
Durco 3"x2" Transfer Pump from Raff	12.0	6	0.1778
Ecochem Gear Pump	12.0	6	0.1778
Ecochem Gear Pump	12.0	6	0.1778
Neutralization Tank Discharge Pump	12.0	6	0.1778
ODS Pump at Dewatering Tanks	12.0	6	0.1778
Polished Raffinate Transfer Pump	12.0	6	0.1778
Portable Pump, Durco 7.5 H.P. Used	12.0	6	0.1778
Portable Pump, Durco 7.5 H.P. Used	12.0	6	0.1778
Portable Pump, Durco 7.5 H.P. Used	12.0	6	0.1778
Raffinate Feed Pump (North)	12.0	6	0.1778
Raffinate Feed Pump (South)	12.0	6	0.1778
Raffinate Polymer Neat Pump	12.0	6	0.1778
Raffinate Polymer Solution Pump (No	12.0	6	0.1778
Raffinate Polymer Solution Pump (So	12.0	6	0.1778
Raffinate Sludge Solids Pump (North	12.0	6	0.1778
Raffinate Sludge Solids Pump (South	12.0	6	0.1778
Transfer Pump Pond 3E	12.0	6	0.1778
Transfer Pump Pond 5	12.0	6	0.1778
Transfer Pump Pond 6	12.0	6	0.1778
Treat. Raffinate Evaporator Fan Pon	64.0	32	0.5021
Treat. Raffinate Evaporator Fan Pon	64.0	32	0.5021
Treat. Raffinate Evaporator Fan Pon	64.0	32	0.5021
Treat. Raffinate Evaporator Pump Po	12.0	6	0.1778
Treat. Raffinate Evaporator Pump Po	12.0	6	0.1778
Treat. Raffinate Evaporator Pump Po	12.0	6	0.1778

Equipment Classification: Tank

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Raffinate Decanting Tank	1988.0	1193	4.7375

Building: Raffinate

Area: Raffinate

Equipment Classification: Tank

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Raffinate Decanting Tank	1988.0	1193	4.7375
Raffinate Decanting Tank	1988.0	1193	4.7375
Raffinate Decanting Tank	1988.0	1193	4.7375
Tank	904.7	543	2.7608
Tank	1809.5	1086	4.3385
Tank	2261.9	1357	5.1273
Tank	1583.3	950	4.2070
Total for Area:	15099.8	9002	42.2574

Building: Raffinate

Area: Submerged Combustion Burner

Equipment Classification: Equipment

Description		Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Submerged combustion burner		1696.0	1187	0.0470
	Total for Area:	1696.0	1187	0.0470
	Total for Building:	16795.8	10189	42.3044

Building: S/X

Area: S/X

Equipment Classification: Equipment

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
#1 Scrub Discharge Pump	12.0	6	1.3203
Acid Scrub Feed (BDC) Pump	12.0	6	1.3203
Ammonium Sulfate Tank Disch. Pump F	28.2	28	2.0132
Ammonium Sulfate Tank Discharge Pum	12.0	6	1.2161
Ammonium Sulfate Work Tank Strainer	28.2	28	2.0132
Caustic Solution-Solvent Centrifuge	48.1	48	2.7518
Caustic Tank Discharge Pump	12.0	6	1.2161
Centrifuge Feed Pump	12.0	6	1.2161
D.S. Filter on Adjustment Tk. line	28.2	28	2.0132
D.S. Filter on Adjustment Tk. line	28.2	28	2.0132
Distillate Pump Group II Durion	12.0	6	1.3203
Evaporator Seal Leg	8.8	9	1.0524
Exhaust Fan	64.0	32	3.7281
Exhaust Fan	64.0	32	3.7281
Exhaust Fan	64.0	32	3.7281
Exhaust Fan	64.0	32	3.7281
Exhaust Fan	64.0	32	3.7281
Exhaust Fan	64.0	32	3.7281
Extract Scrub Feed Heater	4.7	4	0.5824
Fanjet, 10,600 CFM Acme No. RR305	75.4	38	3.9040
Fanjet, 10,600 CFM, Acme No. RR305	75.4	38	3.9040
Feed Pump Group II Duriron	12.0	6	1.3203
Floor Sump Pump (Gould)	12.0	6	1.3203
Heating & Ventilating Unit	768.0	384	19.8835
Hexane Condenser	14.0	14	1.6011
Hexane Condenser Phase Separator	9.4	9	0.9538
Hexane Condenser Phase Separator 2'	6.8	7	0.7735
Hexane Condenser Sub-Cooler	9.8	10	0.9465
Hexane Make-up Pump	3.0	2	0.4650
Hexane Recovery Still	653.4	392	15.8417
Hexane Recovery Still Discharge Pum	12.0	6	1.2161
Hexane Still Phase Separator	9.4	9	0.9317
Hexane Transfer Pump	2.3	1	0.7133
Hexane Vent Exchanger	1.1	1	0.3813
Internal Contamination of Equipment	0.0	0	15.5000
NO. 2 Extract Scrub Tank Mix Pump	12.0	6	1.2161
No. 1 Extract Scrub Tank Mix Pump	12.0	6	1.2161

Building: S/X

Area: S/X

Equipment Classification: Equipment

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Organic Separator	603.1	362	14.3837
Pulse Column External Heater	8.0	6	3.9270
Pulse Column External Heater	12.0	10	1.6310
Pumper-Decanter Mix Pump	12.0	6	1.2161
Pumper-Decanter Mix Pump	12.0	6	1.2161
Pumper-Decanter Mix Pump	12.0	6	1.2161
Pumper-Decanter Mix Pump	12.0	6	1.2161
Pumper-Decanter Mix Pump	12.0	6	1.2161
Pumper-Decanter Mix Pump	12.0	6	1.2161
Raffinate Decanter	206.7	124	7.9935
Raffinate Decanter Feed Pump	12.0	6	1.2161
Raffinate Decanter Feed Pump	12.0	6	1.2161
Re-Extraction Column Pulse Generato	160.0	80	7.1456
Re-extraction Pulse Column	623.2	374	17.3651
Re-extraction Pulse Column	623.2	374	17.3651
Re-extraction column Pulse Generato	27.0	24	2.1134
Recirculating Pump	12.0	6	1.3203
Recovered Acidic Condensate Dischar	15.0	8	1.5201
Recovered Acidic Condensate Heat Ex	14.7	15	1.2376
SX ADU Feed Pump	12.0	6	1.3203
SX Organic Separator	1131.0	679	23.4249
SX Seal Water Settling Pot (Filter)	28.2	28	2.0132
SX Seal Water Settling Pot (Filter)	28.2	28	2.0132
Slurry Feed Break Tank Agitator	4.4	3	0.9065
Slurry Feed Break Tank Discharge Pu	12.0	6	1.2161
Solvent Cooler	12.0	12	1.6310
Solvent Cooler	1.0	1	0.2595
Solvent Extraction Seal Water Coole	4.7	5	0.5824
Solvent Extraction Seal Water Pump	7.8	4	0.9121
Solvent Extraction Seal Water Pump	7.8	4	0.9121
Solvent Extraction Sump Pump	12.0	6	1.2161
Solvent Preparation Tank Agitator	11.0	8	1.4015
Solvent Preparation Tank Discharge	12.0	6	1.2161
Solvent Rework Sump Pump	12.0	6	1.2161
Solvent Settling Tank Feed Pump	12.0	6	1.2161
Solvent Work Tank Agitator	19.4	14	2.0529
Solvent Work Tank Discharge Pump	12.0	6	1.2161

Building: S/X

Area: S/X

Equipment Classification: Equipment

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Steam Compressor RCC	192.0	192	8.6990
Sump & pump	8.0	4	0.8898
Sump (portable pump suction sump)	12.5	13	1.2050
Sump Liquor Collection Tank Dischar	12.0	6	1.2161
Sump Liquor Gross Sediment Separato	21.2	21	1.6469
Sump Liquor Strainer Filter	28.2	28	2.0132
Sump Liquor Strainer Filter	28.2	28	2.0132
Sumps (2)	8.0	8	0.8898
TBP Drum Transfer Pump	12.0	6	1.2161
TBP Unloading Pump	12.0	6	1.3203
UNH Decanter Feed Pump	12.0	6	1.2161
UNH Surge Tank Discharge Pump	12.0	6	1.2161
UNH Surge Tank Discharge Pump	12.0	6	1.3203
Vertiflow, 400,000 BTU Heater	78.5	63	3.9650
Vertiflow, 400,000 BTU Heater	78.5	63	3.9650
Vertiflow, 400,000 BTU Heater	78.5	63	3.9650
Vertiflow, 400,000 BTU Heater	78.5	63	3.9650

Equipment Classification: Tank

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Acid Scrub Feed Tank	47.1	47	3.9040
Ammonium Sulfate Work Tank	157.0	94	6.1151
Auxiliary Sump Liquor Collection Ta	87.9	53	4.1934
Caustic Work Tank	157.0	94	6.1151
Condensate Collection Tank	125.6	75	5.5912
Extract Scrub Tank	159.0	95	6.4210
Extract Scrub Tank	159.0	95	6.4210
Feed Tank	117.8	71	5.1852
Hexane Head Tank	9.4	9	0.9317
Hexane Storage & Work Tank	2544.6	1527	46.6513
Pumper Decanter Tank No. 2	159.0	95	6.4210
Pumper Decanter Tank No. 3	159.0	95	6.4210
Pumper Decanter Tank No. 4	159.0	95	6.4210
Pumper Decanter Tank No. 5	159.0	95	6.4210
Pumper Decanter Tank No. 6	159.0	95	6.4210

Building: S/X

Area: S/X

Equipment Classification: Tank

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Pumper Decanter Tank No. I	159.0	95	6.4210
RAC Tank	402.0	241	11.7122
Raff. Disposal Pump Surge Tank	397.6	239	11.1384
Raffinate Holding Tank #1	954.2	573	20.4426
Raffinate Holding Tank #2	954.2	573	20.4426
Recovered Acidic Condensate Tank	314.1	188	10.7747
SX ADU Feed Tank	6.2	6	0.7320
Slurry Feed Break Tank	76.9	46	3.9750
Solvent Cleaning 1st Stage Mix Tank	176.7	106	6.6976
Solvent Cleaning 2nd Stage Mix Tank	176.7	106	6.6976
Solvent Cleaning Settling Tank	176.7	106	6.6976
Solvent Dump Tank	2544.6	1527	46.6513
Solvent Preparation Tank	127.2	76	5.3729
Solvent Work Tank	282.7	170	9.0854
Sump Liquor Collection Tank	87.9	53	4.1934
TBP Storage Tank	567.0	340	14.7779
UNH Surge Tank	269.3	162	8.5615
Total for Area:	18778.0	11419	603.7004
Total for Building:	18778.0	11419	603.7004

Building: WPC Building

Area: Roof

Equipment Classification: Tank

Description		Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
PVC tank		226.1	136	0.0017
	Total for Area:	226.1	136	0.0017
	Total for Building:	226.1	136	0.0017

Architectural Materials

	Disposal Volume Cu. Ft.
Block	40703
Carbon Steel	748
Corrugated Metal	9368
Miscellaneous	100
Roof	43450
Transite	1080
Total Volume	95449

Asphalt

	Disposal Volume Cu. Ft.
Asphalt	13255
Total Volume	13255

Concrete

	Disposal Volume Cu. Ft.
Concrete	499581
Total Volume	499581

Equipment

	Disposal Volume Cu. Ft.
Aluminum	308
Carbon Steel	127912
Fibercast	188
Fiberglass	2809
Galvanized Steel	3892
Internal Contamination	0
Miscellaneous	688
Monel	9312
Plastic	3460
Polyvinyl Chloride	136
Sand	1810
Stainless Steel	58975
Total Volume	209490

Miscellaneous Materials

	Disposal Volume Cu. Ft.
Carbon Steel	3103
Empty Drums	2152
Fencing	71831
Insulation	157
Miscellaneous	43913
Paper	4500
Sand	120
Wood	17813
Total Volume	143589

Pipe

	Disposal Volume Cu. Ft.
Carbon Steel	6185
Copper Tubing	93
Inconel	1
Monel	280
Pipe	88
Polyvinyl Chloride	44
Stainless Steel	1230
Unknown Pipe	16511
Total Volume	24432

Structural Steel

	Disposal Volume Cu. Ft.
Structural Steel	37344
Total Volume	37344

Architectural Materials

Building: DUF4

Description		Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
6 mil poly		1.4	1	32.9634
6 mil poly		1.4	1	33.0689
	Total for Building:	2.9	2	66.0324

Building: General Site

Description		Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Trailer		384.0	77	0.0149
	Total for Building:	384.0	77	0.0149

Building: Main Process Building

Description		Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Fiberglass roofing		21.2	21	0.0213
	Total for Building:	21.2	21	0.0213

Equipment

Building: DUF4

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Misc Equipment	87.5	88	2.5297
Reactor Heater	53.1	43	0.8043
Reactor Heater	53.1	43	0.8043
Reactor Heater	53.1	43	0.6241
Reactor Heater	53.1	43	0.6241
Reactor Heater	53.1	43	1.6504
Reactor Heater	53.1	43	1.6504
Reactor Heater	53.1	43	1.6504
Reactor Heater	53.1	43	1.6504
Total for Building:	512.7	432	11.9883

Building: General Site

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Dredges	256.0	256	0.0064
Total for Building:	256.0	256	0.0064

Miscellaneous Materials

Building: Bechtel Building

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Miscellaneous Parts	3900.0	2925	0.8860
Total for Building:	3900.0	2925	0.8860

Building: General Site

Description	Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
2 1/2 Ton Winch Truck	1000.0	600	0.0251
Ash Receiver Elect. Platform Truck	1000.0	600	0.0251
Backhoe Ser. No. 387011	800.0	480	0.0200
Boat w/ 50 HP Mtr.	30.0	18	0.0007
Drum Grab	2.0	2	0.0000
Drum Grab	2.0	2	0.0000
Fertilizer Truck	1200.0	720	0.0301
Fork Lift	800.0	480	0.0200
Fork Lift	800.0	480	0.0200
Fork Lift	1000.0	600	0.0251
Fork Lift Ser. No. 3	1000.0	600	0.0251
Fork Lift Truck	800.0	480	0.0200
Fork Lift Truck	800.0	480	0.0200
Fork Lift Truck	800.0	480	0.0200
Forklift	300.0	180	0.0075
Lift Truck	800.0	480	0.0200
Miscellaneous	800.0	600	12.5544
Miscellaneous junk under tarps	7680.0	7680	3.1335
Pick-up 1-ton (WHS)	1000.0	600	0.0251
Pick-up 1/2 Ton (Prod.)	900.0	540	0.0225
Pick-up 1/2 Ton 4WD (Engineer)	900.0	540	0.0225
Pick-up 3/4 Ton Welding Truck	900.0	540	0.0225
Pick-up 4-WD (HP)	900.0	540	0.0225
Pick-up truck	409.5	410	0.0181
Portable Vacuum Cleaner	2.0	2	0.0000
Supercompacted boxes	1344.0	1344	0.7592
Tractor Ser. No. 320454L	800.0	480	0.0200
Trailer - Uranium Slurry Ser. No. 2	193.0	116	0.0048
Total for Building:	26962.5	20074	16.8855

Miscellaneous Materials

Building: Main Process Building

Description		Volume Cu. Ft.	Disposal Volume Cu. Ft.	Activity Millicuries
Control Panels		3000.0	1500	0.0139
Miscellaneous Parts		25885.8	19414	0.0448
	Total for Building:	28885.8	20914	0.0587

Appendix G
Sequoyah Facility
Waste Evaluation & Size Reduction/
Decontamination Facility Report
Drawings and References

SEQUOYAH FUELS PROJECT DRAWINGS		
TITLE	**DRAWING NO.**	**REV. #**
ADMINISTRATIVE BUILDING CIVIL/ARCHITECTURAL/STRUCTURAL DRAWINGS		
Administrative & Laboratory Bldg Foundation Plan-Sec. & Det.	121-C-201	5
Process Bldg. Control Rm Area Concrete Floor El. 16'6" & 19'-0"	121-C-202	3
Admin. & Laboratory Roof Plan & Sections	121-C-301	0
Process Bldg. Control Room Area Framing at EL. 10'6"	121-C-302	3
Process Bldg. Control Room Area Framing at EL. 16'-6" & 19'-0"	121-C-303	4
Process Bldg. Control Room Area Framing at EL.	121-C-304	5
Process Bldg. Control Room Area Platforms-EL. 16'-6" & 19'0"	121-C-307	1
Process Bldg. Control Room Area Platforms-EL. 28'-0"	121-C-308	3
Admin. & Change Area Ground Floor Plan	121-C-401	4
Laboratory & Sample Preparation Area, Plan, Schedule & Details	121-C-402	1
Administrative & Lab Area Roof Plan Cable Spreading Area Floor Plan	121-C-403	2
Control Room Area Floor Plan	121-C-404	3
Future Offices & Mechanical Equip. Room Plan	121-C-405	2
Admin. & Laboratory Exterior Elevations & Details	121-C-406	1
SHOP UTILITY BUILDING CIVIL/STRUCTURAL/ARCHITECTURAL		
Shop & Utility Bldg. Foundation Plan & Sections	122-C-201	5
Shop & Utility Bldg. Floor Slab Plan, Sect's & Det's	122-C-204	6
Shop & Utility Bldg. Roof Plan, Sect's & Det's	122-C-301	6
Shop & Utility Bldg. Area Misc. Stl. Details	122-C-302	3
Shop & Utility Bldg. Floor and Roof Plans	122-C-401	7

Appendix G
Sequoyah Facility
Waste Evaluation & Size Reduction/
Decontamination Facility Report
Drawings and References

SEQUOYAH FUELS PROJECT DRAWINGS		
TITLE	**DRAWING NO.**	**REV. #**
BUILDING UTILITY SUPPORT SYSTEMS CIVIL/STRUCTURAL		
Water Supply		
Water Supply Sedimentation & Portable Water Storage Basins	160-C-201	5
Water Supply Sedimentation & Portable Water Storage Basins	160-C-202	4
Water Supply Sedimentation & Portable Water Storage Basins	160-C-203	4
Water Supply Sedimentation & Portable Water Storage Basins Miscellaneous Details	160-C-204	
Dust Collection		
Plant Dust Collector Top Deck Enclosure	201-C-3026	1
MAIN PROCESS BLDG. - ARCHITECTURAL DRAWINGS		
Process Bldg. Ground Floor Plan	201-C-401	9
Process Bldg. Elevated Floor Plans	201-C-402	3
Process Bldg. Roof Plan	201-C-403	13
Process Bldg. Exterior Elevations (West & South)	201-C-404	7
Process Bldg. Exterior Elevations (East & North)	201-C-405	3
Process Building Sections	201-C-406	4
WASTE SYSTEMS MECHANICAL ARRANGEMENT DRAWINGS		
H_2F_2, F_2 & S Disposal		
Waste Systems H_2F_2, HF & S Disposal General Arrangement Sect.	170-M-203	1
Waste Systems H_2F_2, HF & S Disposal General Arrangement Plan	170-M-204	1
NO_x Emissions		
NO_x Emission Control System - Gas Stream Piping Plan	170-M-5007	1
NO_x Emission Control System - Gas Stream Piping - Elevation	170-M-5008	2

Appendix G
Sequoyah Facility
Waste Evaluation & Size Reduction/
Decontamination Facility Report
Drawings and References

SEQUOYAH FUELS PROJECT DRAWINGS		
TITLE	**DRAWING NO.**	**REV. #**
NO_x Emission Control System - Waste Liquid Line t Clarifier "A" (on pipe rack)	170-M-5009	
WASTE SYSTEMS CIVIL/STRUCTURAL		
NO_x Control		
NO_x Emission Control System - Concrete Slab Details	170-C-2001	
NO_x Emission Control System - Scrubber Support Steel Details	170-C-3004	
NO_x Emission Control System - Exhaust Stack Support Details	170-C-3005	
NO_x Scrubber Platform Details (Sheet 1)	170-C-3006	
NO_x Scrubber Platform Details (Sheet 2)	170-C-3007	
NO_x Scrubber Platform Details (Sheet 3)	170-C-3008	
NO_x Scrubber, Platforms for Recirculation Tanks	170-C-3009	
Noncontaminated Incinerator Wall Details	170-C-3010	
Noncontaminated Incinerator		
Noncontaminated Incinerator Building Steel Details	170-C-3011	
Noncontaminated Incinerator Loading Platform Details	170-C-3012	
MAIN PROCESS BUILDING - EQUIPMENT ARRANGEMENT DRAWINGS		
General Arrangement Main Process Facility Ground Floor Plan (2 pgs)	201-M-202	3
General Arrangement Main Process Facility Plan - Above EL.10'-0" (2 pgs)	201-M-203	3
General Arrangement Main Process Facility Sections	201-M-204	3
General Arrangement Main process Facility Sections	201-M-205	3
General Arrangement Facility - Elevations	201-M-206	
Gen. Arr. Chemical, Gas Handling Boiler Area - Plan	201-M-207	2
Sampling Area - General Arrangement	202-M-201	3

Appendix G
Sequoyah Facility
Waste Evaluation & Size Reduction/
Decontamination Facility Report
Drawings and References

SEQUOYAH FUELS PROJECT DRAWINGS		
TITLE	**DRAWING NO.**	**REV. #**
Sampling Area - Plans - Ground Floor & EL. 13'-1-1/2"	220-M-202	3
Sampling Area - Plans - Ground Floor & EL.22'-6" & EL. 32'-6"	202-M-203	4
Sampling Area - Sec. "A" & "B"	220-M-204	3
Sampling Area - Elevation @ Col. Line "G"	220-M-205	3
Digestion Area (230) Plan/Sections		
Digestion Area - Equipment Arrangement Plan & Ground Floor & @ Elevation 13'-	230-M-202	
Digestion Area - Gen. Arrangement Plant @ Elevation 26'-3"	230-M-203	3
Digestion Area - Gen. Arrangement Section "A"	230-M-204	6
Digestion Area - Gen. Arrangement Sections "B" & "C"	230-M-205	3
DENITRATION/RED/HYDROFLUORIN (260) PLANS/SECTIONS		
Denitration, Reduction & Hydrofluorination Gen. Arrangement	260-M-201	2
Denitration, Reduction & Hydrofluorination Plans	260-M-202	7
Denitration, Reduction & Hydrofluorination Sections A, C, G, & L	260-M-203	6
Denitration, Reduction & Hydrofluorination Sections D, E, J & K	260-M-204	
Denitration, Reduction & Hydrofluorination Enlarged Section "F"	260-M-205	3
Fluorination (270) Plans/Sections		
Fluorination - Gen. Arrangement Plan at EL. 0'-0" & 10'-C	270-M-203	9
Fluorination - Gen. Arrangement Plan at EL. 19'-0" & 29'-0"	270-M-204	10
Fluorination - Gen. Arrangement Sections "E" & "F"	270-M-205	8
Fluorination - Gen. Arrangement Sections "G", "H", "I" & "J"	270-M-206	10

Appendix G
Sequoyah Facility
Waste Evaluation & Size Reduction/
Decontamination Facility Report
Drawings and References

SEQUOYAH FUELS PROJECT DRAWINGS		
TITLE	**DRAWING NO.**	**REV. #**
Fluorination - Gen. Arrangement Sections "A", "B", "C", & "D"	270-M-207	9
UF_6 Cylinder Steam Heating Chests Gen. Arrange. (Elevations)	280-M-2002	3
MAIN PROCESS BUILDING ARCHITECTURAL DRAWINGS		
Process Building Ground Floor Plan	201-C-401	9
Process Building Elevated Floor Plans	201-C-402	3
Process Building Roof Plan	201-C-403	13
Process Building Exterior Elevations (West & South)	201-C-404	7
Process Building Exterior Elevations (East & North)	201-C-405	3
Process Building Sections	20?-C-406	4
MAIN PROCESS BUILDING STRUCTURAL DRAWINGS		
Main Building Roof Plans	201-C-301	10
Main Building Roof Plans	201-C-301	10
Main Building Roof Plans	201-C-301	10
Main Building Roof Plans	201-C-30?	10
Process Building Elevation at Col.Lines 1, 4, & 8	201-C-302	9
Process Building Elevation at Col.Lines A, G, & C6	201-C-303	5
Process Building Elevation at Col.Lines 5, 6, & 7	201-C-304	1
Process Building Elevation at Col.Lines 2 & 3	201-C-305	1
Process Building Framing - Elevation 10'-0"	201-C-314	13
Process Building Framing - Elevation 10'-0"	201-C-314	13
Process Building, Cold Trap Area Framing at Elev 10'-0" & EL. 19'-0"	201-C-315	10
Process Building Framing - Elevation 19'-0"	201-C-316	12

SEQUOYAH FUELS PROJECT DRAWINGS		
TITLE	**DRAWING NO.**	**REV. #**
Process Building Framing - Elevation 29'-0"	201-C-317	13
Process Building Framing - Elev. 13'-1-1/2", 16'-0" & 19'-0"	201-C-319	5
Process Building Framing - Elevation 22'-6" & 26'-3"	201-C-320	7
Process Building Sampling Area Framing - EL. 32'6" & EL. 35'-7-1/2"	201-C-321	4
Process Building Platform - Elevation 10'-0"?	201-C-340	6
Process Building, Cold Trap Area Platforms at EL. 10'-0" & EL. 19'-0"	201-C-341	4
Process Building Platform - Elevation 19'-0"	201-C-342	4
Process Building Platform - Elevation 29'-0"	201-C-343	6
Process Building Platforms - Elev. 13'-1-1/2", 16'-0" & 19'-0"	201-C-344	3
Process Building Platforms @ Elev. 22'-6" & 26'-3"	201-C-345	1
Process Building Sampling Area Platform - EL.32'-6" & EL. 35'-7-1/2"	201-C-346	1
FLUORINE PRODUCTION PLANT (AREA - 400)		
Fluorine Building Civil		
Fluorine Bldg. Foundation Plan & Sect.	400-C-201	4
Fluorine Bldg. Floor Slab Plan & Sections	400-C-240	4
Fluorine Bldg. Structural		
Fluorine Bldg. Roof Plan	400-C-300	3
Fluorine Bldg. Sections, Elev's & D E T L(?)	400-C-302	4
Fluorine Bldg Sections & Details	400-C-303	
Fluorine Bldg. Sections & ???	400-C-305?	
Fluorine Bldg. Architectural		
Fluorine Bldg. Floor & Roof Plans	400-C-401	

Appendix G
Sequoyah Facility
Waste Evaluation & Size Reduction/
Decontamination Facility Report
Drawings and References

SEQUOYAH FUELS PROJECT DRAWINGS		
TITLE	**DRAWING NO.**	**REV. #**
Fluorine ? Elevations ??	400-C-402	
Process Piping		
F_2 Production Cell Room - Piping Secs. A C D E F	400-M-503	9
F_2 Production Cell Rework Area - Piping Plans Below Elev. 18'-6"	400-M-504	7
F_2 - Production Cell Rework Area - Piping Plans @ Elevs. 9"-0" & 28'-0"	400-M-505	10
F_2 - Production Cell Rework Area - Piping Sec. 'A', 'C', & 'D'	400-M-506	?0
F_2 - Production Cell Rework Area - Piping Sec. 'B', 'E', & 'F'	400-M-507	10
F_2 - Production Hydrogen Piping Plan & Sections	400-M-508	2
F_2 - Production Hydrogen Piping Plan "X" & Sections	400-M-509	5
Roof Drainage Fluorine Bldg Plan Below EL. 12'-8" & Isometric Diagram	400-M-698	5
SORBENT EXTRACTION BUILDING: CIVIL/STRUCTURAL ARCHITECTURAL		
Civil Drawings		
Solvent Extraction Bldg. Foundation Plan Secs. & Details	240-C-102	?
Solvent Extraction Bldg. Ground Floor Plan	240-C-202	?
Solvent Extraction Bldg. Pulse Col. & Gen. Fdn. & Elevated Sla? Plans, Sections & Detail	240-C-204	?
Solvent Extraction Bldg Tank Foundations	240-C-209	?
Structural		
Solvent Extraction Bld'g Roof Plan	240-C-301	5
Solvent Extraction Bld'g Elevations & Sections	240-C-302	6
Solvent Extraction Platform Plans, Elevations & Details	240-C-303	4
Solvent Extraction Bldg. Misc. Platforms, Sect's. & Det's.	240-C-304	1

Appendix G
Sequoyah Facility
Waste Evaluation & Size Reduction/
Decontamination Facility Report
Drawings and References

SEQUOYAH FUELS PROJECT DRAWINGS		
TITLE	**DRAWING NO.**	**REV. #**
Solvent Extraction Bldg. Misc. Outside Platforms	240-C-305	2
Architectural		
Architectural Solvent Extraction Bldg Plans, Elevations, Section	240-C-401	4
Equipment Arrangement		
Gen. Arrangement Solvent Extraction & Evaporation	240-M-201	2
Areas 240 & 290 Solvent Extraction Gen. Arrangement Plan	240-M-202	3
Areas 240 & 290 Solvent Extraction Gen. Arrangements Sections	240-M-203	3
MAIN BUILDING PROCESS PIPING: MECHANICAL LAYOUT PLANS/SECTIONS		
Pipeway Plans/Sections		
Pipeway Plans/Sections	201-M-501	5
Pipeway Plans/Sections	201-M-502	10
Pipeway Plans/Sections	201-M-503	4
Pipeway Special Pipe Support	201-M-507	1?
Pipeway Special Pipe Support	201-M-508	1
Pipeway Plan & Sections	201-M-509	1
Building Sanitary Steam Water		
Main Process Bldg Equip. & Sanitary Drainage Ground Floor Plan	201-M-643	6
Building Floor Drains		
Equipment Drainage Main Process Bldg Isometric Diagram	201-M-645	4
Roof Drainage Process Bldg. Details & Isometric Diagram	201-M-655	3
Vacuum Cleaning		
Vacuum Cleaning System isometric & Details	201-M-661	1
Digestion Area Process Pipe Plans & Sections		

Appendix G
Sequoyah Facility
Waste Evaluation & Size Reduction/
Decontamination Facility Report
Drawings and References

SEQUOYAH FUELS PROJECT DRAWINGS		
TITLE	**DRAWING NO.**	**REV. #**
Digestion Area - Piping Plan @ Ground Floor & @ Elevation 13'-1-1/2"	230-M-501	7
Digestion Area - Piping Plan & Elevation 26'-3"	230-M-502	5
Digestion Area - Piping Section "A"	230-M-503	8
Digestion Area - Piping Sections "B" & C"C	230-M-504	7
Denitration, Reduction, Hydrofluoriation		
Denitration, Reduction & Hydrofluorination Piping Plans	260-M-501	10
Denitration, Reduction & Hydrofluorination Piping Sections	260-M-502	9
Denitration, Reduction & Hydrofluorination Piping Sections	260-M-503	4
Fluorination		
Fluorination Piping Plan at EL. 0'-0"-10'-0"	270-M-501	6
Fluorination Piping Plan at EL. 19'-0" & 29'-0"	270-M-502	8
Fluorination Piping Sections	270-M-503	2
Fluorination Piping Sections	270-M-504	6
Fluorination Piping Sections & Details	270-M-505	6
Fluorination Piping Sections & Details	270-M-506	6
Fluorination Piping Sections & Details	270-M-512	8
Fluorination Primary Reactor General Piping	270-M-513	2
Fluorination Clean-up Reactor Gen'l Piping	270-M-514	?
Fluorination Special Piping Support Sections & Details	270-M-515	1
SOLVENT EXTRACTION EQUIPMENT ARRANGEMENT AND PIPING		
Equipment Arrangement		
Gen Arrng. Solvent Extraction & Evaporation	240-M-201	2

Appendix G
Sequoyah Facility
Waste Evaluation & Size Reduction/
Decontamination Facility Report
Drawings and References

SEQUOYAH FUELS PROJECT DRAWINGS		
TITLE	**DRAWING NO.**	**REV. #**
Areas 240 & 290 Solvent Extraction Gen. Arrangement Plan (2 pgs)	240-M-202	3
Areas 240 & 290 Solvent Extraction Gen. Arrangement-Sections	240-M-203	3
Gen. Arrangement Evaporator Area Plan & Sects	240-M-204	1
Piping		
Solvent Extraction Piping Area "B" Plan	240-M-502	8
Solvent Extraction Piping Area "C" Plan	240-M-503	1?
Solvent Extraction Piping Area "D" Plan	240-M-504	6
Solvent Extraction Piping Area "A" Sections	240-M-505	6?
Solvent Extraction Piping Area "B" Sections	240-M-506	6
Solvent Extraction Piping Area "B" Sections	240-M-507	?
Solvent Extraction Piping Area "C" Sections	240-M-508	8
Solvent Extraction Piping Area "C" Sections	240-M-509	7
Solvent Extraction Piping Area "D" Sections	240-M-510	7
Solvent Extraction Piping Area "D" Sections	240-M-511	5
YARDS, UTILITIES, TANK FARMS **- CIVIC, STRUCTURAL, ARCHITECTURAL** **- EQUIPMENT ARRANGEMENT**		
General Arrangement Sequoyah Facility (Plan)	100-M-201	
General Arrangement Sequoyah Facility (Plan)	100-M-201	1
Gen. Arrangement Chemical, Gas Handling Boiler Area - Plan	201-M-207	2
Gen. Arrangement Chemical Gas Handling and Boiler Area Sections	201-M-208	2
Drum Receiving Dock & Storage Slab Plan Sections & Details	201-C-201	3
UF_6 Storage Slab Plan Sections and Details	280-C-201	3
UF_6 Storage Slab Plan Sections and Details	280-C-201	?

Appendix G
Sequoyah Facility
Waste Evaluation & Size Reduction/
Decontamination Facility Report
Drawings and References

SEQUOYAH FUELS PROJECT DRAWINGS		
TITLE	**DRAWING NO.**	**REV. #**
Chem. Receiving Handling & Storage Gen. Arrangement Tank Farm Plan & Section "A"	340-M-201	8
Chem. Receiving Handling & Storage Gen. Arrangement Tank Farm Plan & Section "A"	340-M-201	8
Chem. Receiving Handling & Storage Tank Farm & Addition Plan, Elevations "B", "C", & "E", & Section	340-M-202	5
Chem. Receiving Handling & Storage AHF Pre-Treat & Ammonia Cracking Gen. Arrangement Plan Sec. "A"	340-M-204	5
Tank Farm Piping Plan & Sections	340-M-502	7
Tank Farm Piping Sections	340-M-503	7
Chemical Receiving AHF Pre-treat. & Ammonia Cracking Piping Plan & Section A	340-M-505	5
Steam System - Boiler Facility Gen. Arrangement	510-M-201	1
Steam System - Boiler Facility Gen. Piping Arrangement	510-M-501	5
Steam System - Boiler Facility Gen. Piping Arrangement	510-M-502	2
Steam System - Breeching Layout and Piping at Stack	510-M-503	1
Cooling Tower Plan & Sections	530-C-201	3
Cooling Water System Cooling Tower Gen. Arrangement	530-M-101	3
Stack Requirements & Found. Plan, Elevations, Sect's. & Det's. (2 pgs)	600-C-205	5
Chemical, Gas, Handling & Stack Area Misc. Platforms & Framing Plans & Sections	600-3-301	3
Nitric Acid Recovery & Off Gas Treatment Gen. Arrangement	600-M-201	2
Nitric Acid Recovery & Off Gas Treatment Piping Plan & Sect	600-M-501	3
Nitric Acid Recovery & Off Gas Treatment - Piping Sections	600-M-503	2
UF_6 P&ID DRAWING LIST		
Piping & Equipment P&ID Symbols	100-M-103	

Appendix G
Sequoyah Facility
Waste Evaluation & Size Reduction/
Decontamination Facility Report
Drawings and References

SEQUOYAH FUELS PROJECT DRAWINGS		
TITLE	**DRAWING NO.**	**REV. #**
Instrumentation P&ID Symbols	200-J-101	
Instrument Identification	200-J-102	
Recompression Evaporator P&ID Symbols	200-J-1001	
Air Cond. HVAC Flow Diagrams	121-M-603	
Water Distribution P&ID	160-M-102	
Potable Water Supply P&ID	160-M-103	
Fire Protection P&ID	160-M-634	
F2, H2, HF&S Disposal Flowsheet	170-M-103	
F2, H2, HF&S Disposal P&ID	170-M-104	
NO_x Emission Control System P&ID	170-M-1003	
NO_x Emission Control System Flowsheet	170-M-1005	
Fluoride Treatment P&ID	170-M-1006	
Natural Gas P&ID	180-M-101	
Heat & Ventilating Proc. Areas Flow Diag.	201-M-640	
Vacuum, Fume & Dust Collection Diagram	201-M-641	
Portable Water System P&ID	201-m-642	
Main Plant Dust Collection Flow Dia. P&ID	201-M-1008	
Main Plant Breathing Air P&ID	201-M-1009	
Safety Showers P&ID	201-M-1010	
Receiving & Sampling Area Flow Sheet	220-M-101	
Receiving & Sampling Area P&ID (Sheet 1)	220-M-102	
Receiving & Sampling Area P&ID (Sheet 2)	220-M-103	
Slurry Feed Receiving & Measuring P&ID	220-M-1001	
Slurry Feed Receiving & Measuring Flowsheet	220-M-1003	

Appendix G
Sequoyah Facility
Waste Evaluation & Size Reduction/
Decontamination Facility Report
Drawings and References

SEQUOYAH FUELS PROJECT DRAWINGS		
TITLE	**DRAWING NO.**	**REV. #**
Digestion Flowsheet	230-M-101	
Digestion P&ID (Sheet 1)	230-M-102	
Digestion P&ID (Sheet 2)	230-M-103	
Miscellaneous Digest P&ID	230-M-1001	
Slurry Receiving & Sampling P&ID	230-M-1003	
Digestion Expansion Piping P&ID	230-M-1301	
Solvent Extraction Flowsheet	240-M-101	
Solvent Extraction P&ID (Sheet 1)	240-M-102	
Solvent Extraction P&ID (Sheet 2)	240-M-103	
Solvent Extraction P&ID (Sheet 3)	240-M-104	
Solvent Rework Flowsheet	240-M-105	
Solvent Rework P&ID (Sheet 1)	240-M-106	
Solvent Rework P&ID (Sheet 2)	240-M-107	
Solvent Rework P&ID (Sheet 3)	240-M-108	
Evaporation Flowsheet	240-M-109	
Recompression Evaporator P&ID	240-M-1001	
Recompression Evaporator P&ID	240-M-1002	
Solvent Extraction P&ID	240-M-1302	
UNH Boildown Flowsheet	250-M-101	
UNH Boildown P&ID	250-M-102	
UNH Boildown Expansion Piping P&ID	250-M-1301	
Denitration Flowsheet	260-M-101	
Denitration P&ID (Sheet 1)	260-M-102	
Denitration P&ID (Sheet 2)	260-M-103	

Appendix G
Sequoyah Facility
Waste Evaluation & Size Reduction/
Decontamination Facility Report
Drawings and References

SEQUOYAH FUELS PROJECT DRAWINGS		
TITLE	**DRAWING NO.**	**REV. #**
"A" Reduction Flowsheet	260-M-104	
Reduction P&ID	260-M-105	
Hydrofluorination Flowsheet No. 1	260-M-106	
Hydrofluorination P&ID (Sheet 1)	260-M-107	
Hf Recovery ("A" Line) P&ID	260-M-1002	
Hf Screw Reactor ("B" Line) P&ID	260-M-1003	
Hydrofluorination Flowsheet No. 2	260-M-1004	
Hydrofluorination P&ID (Sheet 2)	260-M-1005	
Denit. Exp. Piping process Flowsheet	260-M-1301	
Denitration Exp. Piping P&ID	260-M-1302	
Reduction Exp. Piping Proc. Flowsheet	260-M-1303	
Reduction Exp. Piping P&ID	260-M-1304	
Hydrofluorination Exp. Flowsheet	260-M-1305	
Hydrofluor. Exp. Piping P&ID (Sheet 1)	260-M-1306	
Hydrofluor. Exp. Piping P&ID (Sheet 2)	260-M-1307	
Primary Fluor. Flowsheet	270-M-101	
Primary Fluor. Reactors P&ID	270-M-102	
Primary Fluor. Cold Traps P&ID	270-M-103	
Pri. Fluor. cold Traps Refrig. P&ID	270-M-104	
Secondary Fluor. Flowsheet	270-M-105	
Secondary Fluor. Reactors P&ID	270-M-106	
Sec. Fluor. CT Refrig. P&ID	270-M-1002	
Sec. Cold Trap Heating & Cooling P&ID	270-M-1004	
Sec. Fluor. Exp. Pip. Proc. Flowsheet	270-M-1301	

Appendix G
Sequoyah Facility
Waste Evaluation & Size Reduction/
Decontamination Facility Report
Drawings and References

SEQUOYAH FUELS PROJECT DRAWINGS		
TITLE	**DRAWING NO.**	**REV. #**
Sec. Fluor. Reactor Exp. Piping P&ID	270-M-1302	
Prim. Fluor. Reactor Exp. Piping P&ID	270-M-1303	
Cln-up React. CT Ref. Exp. Pip. P&ID	270-M-1304	
Product Shipping Flowsheet	280-M-101	
Flow. Dia. Symbols Piping & Equip. (Sheet 1)	280-M-1001	
P&ID Dia. Symbols Inst. & Controls Sys. (Sh. 2)	280-M-1002	
Cold Trap Drains/Prod. Loadout & Acct. Scale P&ID	280-M-1003	
Steam Chest P&ID	280-M-1006	
Steam chest Modification Flow Diagram	280-M-1009	
Cylinder Wash Station P&ID	280-M-1011	
Raff. & Chem. Waste Handling Sys. Flowsheet	290-M-101	
Raff. & Chem. Waste Handling Sys. P&ID	290-M-102	
Raffinate Treat. to Ammonium Nitrate	290-M-1014	
Raffinate Sludge Concentration P&ID	290-M-1016	
Misc. Chem. Handling Flowsheet	340-M-101	
Tank Farm HF P&ID	340-M-102	
Tank Farm Misc. Chem. (HNO3 & NH3) P&ID	340-M-103	
AHF Pre-treatment Flowsheet	340-M-104	
AHF Pre-treatment P&ID	340-M-105	
Ammonia Cracking Flowsheet	340-M-106	
Ammonia Cracking P&ID	340-M-107	
Misc. Chem. N2 P&ID	340-M-108	
NH3 Vapor. Mech. Flowsheet	340-M-1001	
Tank Farm Ammonia P&ID	340-M-1002	

Appendix G
Sequoyah Facility
Waste Evaluation & Size Reduction/
Decontamination Facility Report
Drawings and References

SEQUOYAH FUELS PROJECT DRAWINGS		
TITLE	**DRAWING NO.**	**REV. #**
Misc. Chem. Handling Exp. Pipe Flowsheet	340-M-1301	
Tank Farm Exp. Piping Misc. Chem. HNO3 P&ID	340-M-1302	
F2 Production Flowsheet	400-M-101	
F2 Production P&ID	400-M-102	
F2 Cell Cool Water #1 Cell Rm P&ID	400-M-104	
F2 Cell Rework P&ID	400-M-109	
F2 Pro.Plt #2 Cell Rm. Pip. Process Flowsheet	400-M-1301	
F2 Pro.Plt. #2 Cell Rm. Piping P&ID	400-M-1302	
F2 pro. Plt. #2 Piping P&ID	400-M-1303	
F2 Cell Cooling Water #2 Cell Rm. P&ID	400-M-1304	
Fuel Oil P&ID	500-M-101	
Steam Gen. P&ID (Sheet 1)	510-M-101	
Steam Gen. P&ID (Sheet 2)	510-M-102	
High Pressure Steam & Condensate P&ID	510-M-103	
Water Treatment P&ID	510-M-104	
Low Press. Steam Dist. System P&ID	510-M-699	
CWS Emergency & Ret. P&ID	532-M-602	
Recovered Acidic Condensate P&ID	540-M-101	
Seal Water P&ID	550-M-101	
Plant Air & Instrument Air P&ID	560-M-101	
Plant Air & Instrument Air Exp. Piping P&ID	560-M-1301	
Nit. Acid Rec. & Off-Gas Treat. Flowsheet	600-M-101	
Nit. Acid Rec. & Off-Gas Treat. P&ID 2nd Absr. Add.	600-M-1001	
DUF4 P&ID Drawing List		

Appendix G
Sequoyah Facility
Waste Evaluation & Size Reduction/
Decontamination Facility Report
Drawings and References

SEQUOYAH FUELS PROJECT DRAWINGS		
TITLE	**DRAWING NO.**	**REV. #**
Depleted UF4 Flowsheet	800-M-1401	
Process Flow Diagram UF4 Production	800-M-1501	
Process Flow Diagram HF Recovery	800-M-1502	
P&ID Symbols Sheet 1	800-M-1503	
P&ID UF6 Feed System	800-M-1504	
P&ID Reactor & Hydrogen Supply	800-M-1505	
P&ID Prod. packaging Util. Services	800-M-1506	
P&ID HF Recovery System	800-M-1507	
P&ID Symbols Sheet 2	800-M-1508	
HF Refrigeration Unit	800-M-1509	
HF Condensing	800-M-1510	
P&ID DUF6 Heel Removal	800-M-1511	
Pneumatic Conveying System P&ID	800-M-1512	
Piping & Instru. Diagram Micro Pulverizer	800-M-1513	
Mechanical Dust Collection Flow Diagram	800-M-6503	
BUILDING UTILITY SUPPORT SYSTEMS: MECHANICAL ARRANGEMENT		
Dust Collection		
Plant Dust Collection Master Plan	201-M-6001	8
Dust Collector Exhauster & Tiein (Plan)	201-M-6002	3
Dust Collector Exhauster & Tiein (Elevation Looking South)	201-M-6003	3
Dust Collector Elevation Looking West	201-M-6004	2
Dust Collection (Service Inlets #29, 30, 31, 32, 33, & 34)	201-M-6005	
Ash Receiver De-smoke House to Dust Collector - Duct Installation	201-M-6023	

Appendix G
Sequoyah Facility
Waste Evaluation & Size Reduction/
Decontamination Facility Report
Drawings and References

SEQUOYAH FUELS PROJECT DRAWINGS		
TITLE	**DRAWING NO.**	**REV. #**
EQUIPMENT ARRANGEMENT AND PIPING DRAWINGS		
Utility Systems Gen. Arrgmt Shop & Utility Area Plan (2 PGS)	500-M-201	9
Utility System General Arrangement Sections (2 PGS)	500-M-202	6 12
Utility Systems Shop & Utility Area Piping Sections	500-M-503	7
Utility Systems Shop & Utility Area Piping Sections	500-M-504	9
Utility Systems Shop & Utility Area Piping Plan	500-M-505	1
Utility Systems Shop & Utility Area Piping Plan & Sections	500-M-506	1
Utility Systems Shop & Utility Area Piping Plan & Sections	500-M-507	2
DEPLETED URANIUM PLANT: PIPING DRAWINGS		
Breathing Air System	BA-1	1
Breathing Air System	BA-1-AM	2
Condensate Drains from Autoclaves	CLT-100, 101, 113, 114	1
Condensate Drains from Autoclaves	CLT-100-AJ	0
Condensate Vent to Athmos	CLT-102	0
Condensate Vent to Athmos	CLT-102-AJ	0
Condensate from Receiver to Cond. Holding Tanks	CLT-103-AJ	0
Condensate to Holding Tanks	CLT-103-AJ	0
Condensate to Holding Tanks	CLT103-AJ	0
Condensate to Holding Pond	CLT-106	0
Condensate to Holding Pond	CLT-106-AJ	0
Condensate Trapsets from Autoclave System Feed Lines	CLT-107 & CLT-107-AJ	0
Autoclave Samples Lines	CLT-108, 109	0

Appendix G
Sequoyah Facility
Waste Evaluation & Size Reduction/
Decontamination Facility Report
Drawings and References

SEQUOYAH FUELS PROJECT DRAWINGS		
TITLE	**DRAWING NO.**	**REV. #**
Autoclave Condensate Samples Lines	CLT-108, 109	0
Condensate Relief from Autoclaves to Atmosphere	CLT-110,111,112 & CLT-110,111,112AJ	2 1
Cooling Water Supply-Header (3 pgs)	CWS-100-G	0
From Refrig. Unit to Partial Hf Condenser	FR-100-	1
From Existing 12" CWS 60 to Header	CWS-100-G	0
Cooling Water to Refrig. Unit (2 pgs)	CWS-101-G	0
Cooling Water to Cooling Screw Conveyor (2 pgs)	CWS-103-G	0
Cooling Water Return Header (2 pgs)	CWS-104-G	0
Cooling Water Rtn. From Refrigeration Unit to CWS-104-C (2 pgs)	CWS-106-G	0
Cooling Water to Plant Air Compressor (2 pgs)	CWS-107-G	0
Cooling Water from Air Compressor (2 pgs)	CWS-108-G	0
Cooling Water to Sample Coolers	CWS-109,110 & CWS-109,110-G	0 0
From Exist. 3" D.A.-3 to Header	DA-100-H	0
Dissociated Ammonia	DA-100	0
Dissociated Ammonia	DA-100-H	0
Dissociated Ammonia (2 pgs)	DA-100	0
Dissociated Ammonia to Surge Tank	DA-102,103 & DA-102,103-H	1 1
From Dissociated Ammonia Surge Tank to UF_6 Reactor (2 pgs)	DA-104-H	1
Relocation of Portable Water Line	DWC-100	1
	EG-100-1036	0
	FR-100	0

Appendix G
Sequoyah Facility
Waste Evaluation & Size Reduction/
Decontamination Facility Report
Drawings and References

SEQUOYAH FUELS PROJECT DRAWINGS		
TITLE	**DRAWING NO.**	**REV. #**
From Refrig. Unit to Line FR-103-* (2 pgs)	FR-101- & FR-101	1 0
R-13 Vapor to Sub-Cooler E-6	FR-102 & FR-102-*	1
From Refrig. Unit to total HF Condenser (2 pgs)	FR-103	1
Drain From Partial Condenser to Refrig. Unit (2 pgs)	FR-104	1
From Partial HF Cond. to Refrig. Unit (2 pgs)	FR-105- & FR-105	1 0
Partial HF Condenser Trim Iso.	FR-P	2
Total HF Condenser Trim Iso.	FR-T	2
From Run Down Tanks 800-TK-M-590718 to Existing Waste Gas Scrubber	HFAL-100-AC	2
From Run Down Tanks 800-TK-M-590718 to Existing Waste Gas Scrubber	HFAL-101-AC	1
From Total & Partial HF Condensers to AHF-Run-Down TK.800-TK-M-5907	HFC-100-AT	2
HF Liquid-Cryogenic	HF-100 HFC-100-AT	1 2
From Total & Partial HF Condenser to HF Run-Down Tanks	HFC-100,102	2
	HFC-100-AT	2
From HFC-100-AT to AHF Run-Down TK.800-TK-M-5908	HFC-101-AT	2
HF Transfer Lines from Run-Down Tanks (2 pgs)	HFC-103/104	PRE
HF Transfer - Pump Discharge Lines	HFC-105/106	PRE
HF Transfer - Pump Discharge Lies	HFC-105/106	PRE
From Run-down Tanks 800-TK-M-507/8	HFL-100-AD	1
From Run-down Tanks to Existing AHF Storage Tanks	HFL-100-AD	3
Anhydrous HF Vapor	HFVL-100 & HFVL-100-AG	0 1

SEQUOYAH FUELS PROJECT DRAWINGS		
TITLE	**DRAWING NO.**	**REV. #**
Anhydrous HF Vapor to Hydrogen Burner	HFVL-100	1
	HFVL-100-AB	1
H_2 to H_2 Burner to Vent System (2 pgs)	HFVL-100	0
Anhydrous HF Vapor	HFVM-100	3
	HFVM-100-AG	1
Anhydrous HF Vapor	HFVM-101	1
Anhydrous HF Vapor	HFVM-101-AG	0
Start-up Vent & Reactivation Vent (2 pgs)	HFVM-102 & HFVM-102-AF	0 0
Anhydrous HF Vapor to Carbon Traps	HFVM-104-AG	0
Off-Gas From Back-Up Filter to Carbon Traps (2 pgs)	HFVM-104	0
Off-Gas From Carbon Traps to HF Condensers (2 pgs)	HFVM-105,106	0
From Partial Condenser to Total Condenser (2 pgs)	HFVM-108,109 & HFVM-108,109-AB	1 1
Anhydrous HF Vapor	HFVM-110-AG	1
Off-Gas Line Between Carbon Traps	HFVM-113	0
Off-Gas Line Between Carbon Traps	HFVM-114	O
From Existing 10" LPS3 to Header	LPS-100-AJ	0
Steam Supply Header	LPS-100	0
	LPS-100-AJ	0
Steam to Autoclaves (2 pgs)	LPS-101,102 & LPS-101-AJ	0 0
Nitrogen Header (2 pgs)	N-100	1 1
Nitrogen Header (2 pgs)	N-100,109 & N-100,109-AM	0 0

SEQUOYAH FUELS PROJECT DRAWINGS		
TITLE	**DRAWING NO.**	**REV. #**
From Nitrogen Header to Autoclave #1 & #2 (2 pgs)	N-101-AM & N-101-AM	0 0
Nitrogen to Autoclave #1 (2 pgs)	N-102,103	0
Nitrogen to Autoclave #2 (2 pgs)	N-104,105	0
65# Nitrogen Header (2 pgs)	N-106	0
Nitrogen Bump to Offgas Back-up & Cyclone with Filter (2 pgs)	N-106,107,108	0 0
Nitrogen	N-110-AM	0
Nitrogen to Molecular Sieves (2 pgs)	N-111	0
Nitrogen to Cooling Screw Conveyor (2 pgs)	N-112 & N-112-AM	0 0
Nitrogen to Rotary Airlock Valve (2 pgs)	N-113 & N-113-AM	0
From Nitrogen Header to Run-Down Tanks	N-116-AG	0
N_2 Purge to HF Transfer Lines (2 pgs)	N-116 & N-116-AM	PRE PRE
Nitrogen Purge to Carbon Traps (2 pgs)	N-117,118 N-117,118-AM	0 0
Nitrogen Purge to 2" UF-102 (2 pgs)	N-119 & N-119-AM	1
Hydraulic Oil Lines To/From Autoclaves (2 pgs)	OH-100,101,102 & OH-100,101,102	0 0
From Air Receiver to Plant Air Header (2 pgs)	UA-102-AM	1
From Air Header to Utility Stations (2 pgs)	UA-102-AM	1
Plant Air to Impactors on Reactor (3 pgs)	UA-103	1
Plant Air to Impactors on Reactor	UA-103-AM	1
Plant Air to Impactors on Reactor (2 pgs)	UA-103 & UA-103-AM	1 1
Plant (Instrument) Air-Header (2 pgs)	PA-200-AM	O

Appendix G
Sequoyah Facility
Waste Evaluation & Size Reduction/
Decontamination Facility Report
Drawings and References

SEQUOYAH FUELS PROJECT DRAWINGS		
TITLE	**DRAWING NO.**	**REV. #**
From Plant (Inst.) Air-Header to Autoclave Area (2 pgs)	PA-200-AM	0
From Plant (Inst.) Air Hdr. to Service Cnns. (3 pgs)	PA-200-AM	0
From Instrument Air System Header to Serve Connections	PA-201-AM	0
Uranium Hexafluoride to Surge Tank	UF-100	0
Uranium Hexafluoride to Surge Tank	UF-100	1
Uranium Hexafluoride to Surge Tank	UF-100-AT	0
Uranium Hexafluoride to Surge Tank	UF-100-AT	1
Uranium Hexafluoride to Surge Tank	UF-100-AT	1
Uranium Hexafluoride to Surge Tank (2 pgs)	UF-101 & UF-101-AT	0 1
Uranium Hexafluoride to Surge Tank	UF-101-AT	4
From UF_6 Surge Tank to UF_6 Reactor (2 pgs)	UF-102-AT	0
Vacuum System From Hose Connections to (2) Tubular Bag Separators	VACUUM SYS.	0
Piping Support Structure Autoclave Area	SK-M-5502	0
Plant (Instrument) Air-Header (2 pgs)	PA-200-AM	0
From Plant (Inst.) Air-Header to Autoclave Area (2 pgs)	PA-200-AM	0
From Plant (Inst.) Air Hdr. to Service Cnns. (3 pgs)	PA-200-AM	0
From Instrument Air System Header to Serve Connections	PA-201-AM	0
Uranium Hexafluoride to Surge Tank	UF-100	0
Uranium Hexafluoride to Surge Tank	UF-100	1
Uranium Hexafluoride to Surge Tank	UF-100-AT	0
Uranium Hexafluoride to Surge Tank	UF-100-AT	1
Uranium Hexafluoride to Surge Tank	UF-100-AT	1

Appendix G
Sequoyah Facility
Waste Evaluation & Size Reduction/
Decontamination Facility Report
Drawings and References

SEQUOYAH FUELS PROJECT DRAWINGS		
TITLE	**DRAWING NO.**	**REV. #**
Uranium Hexafluoride to Surge Tank (2 pgs)	UF-101 & UF-101-AT	0 0
Uranium Hexafluoride to Surge Tank (2 pgs)	UR-101-AT & UF-101-AT	1 1
From UF_6 Surge Tank to UF_6 Reactor (2 pgs)	UF-102-AT	0
Vacuum System from Hose Connections to (2) Tubular Bag Separators	VACUUM SYS.	0
Piping Support Structure Autoclave Area	SK-M-5502	0
Off-Gas Line Between Carbon Traps	HFVM-111	0
Off-Gas Line Between Carbon Traps	HFVM-114	0
From Existing 10" LPS3 to Header	LPS-10-AJ	0
Steam Supply Header (2 pgs)	PS-100 & LPS-100-AJ	0
Steam to Autoclaves (2 pgs)	LPS-101,102 & LPS-101-AJ	0 0
Nitrogen Header (4 pgs)	N-100 (2 pgs) N-100,109 & N-100,109-AM	1 0 0
From Nitrogen Header to Autoclave #1 & #2 (2 pgs)	N-101-AM	0
Nitrogen to Autoclave #1	N-102,103	0
	N-102,103	0
Nitrogen to Autoclave #2	N-104,105 (2 pgs)	0
65# Nitrogen Header (2 pgs)	N-106	0
Nitrogen Pump to Offgas Back-up & Cyclone with Filter (2 pgs)	N-106,107,108	0
Nitrogen	N-110-AM	0
Nitrogen to Molecular Steves (2 pgs)	N-111	0
Nitrogen to Cooling Screw Conveyor (2 pgs)	N-112 & N-112-AM	0

Appendix G
Sequoyah Facility
Waste Evaluation & Size Reduction/
Decontamination Facility Report
Drawings and References

SEQUOYAH FUELS PROJECT DRAWINGS		
TITLE	**DRAWING NO.**	**REV. #**
Nitrogen to Rotary Airlock Valve (2 pgs)	N-113 & N-113-AM	0
From Nitrogen Header to Run-Down Tanks	N-116-AG	0
N_2 Purge to HF Transfer Lines (2 pgs)	N-116 & N-116-AM	PRE
Nitrogen Purge to Carbon Traps (2 pgs)	N-117,118 & N-117,118-AM	0 0
Nitrogen Purge to 2" UF-102 (2 pgs)	N-119 & N-119-AM	1 0
Hydraulic Oil Lines To/From Autoclaves (2 pgs)	OH-100,101,102 & OH-100,101,102	0 0
From Air Receiver to Plant Air Header (4 pgs)	UA-102-AM	1
Plant Air to Impactors on Reactor (6 pgs)	UA-103, UA-103, UA-103, UA-103-AM, UA- 103, & UA-103-AM	1 1 1 1
Relocation of Portable Water Line	DWC-100	0
HF Tanks-Glycol Piping (2 pgs)	EG-100-103G & FR-100	0 0
From Refrig. Unit to Line FR-103-* (3 pgs)	FR-101 FR-101 FR-102-*	1 0 1
From Refrig. Unit to Total HF Condenser (2 pgs)	FR-103	1
Drain From Partial Condenser to Refrig. Unit (2 pgs)	FR-104-*	1
From Partial HF Cond. to Refrig. Unit	FR-105	1 0
Partial HF Condenser Trim Iso.	FR-P	2
Total HF Condenser Trim Iso.	FR-T	2
From Run Down Tanks 80-TK-M-5907/8 to Existing Waste Gas Scrubber	HFAL-100-AC	2

Appendix G
Sequoyah Facility
Waste Evaluation & Size Reduction/
Decontamination Facility Report
Drawings and References

SEQUOYAH FUELS PROJECT DRAWINGS		
TITLE	**DRAWING NO.**	**REV. #**
From Run Down Tanks 80-TK-M-5907/8 to Existing Waste Gas Scrubber	HFAL-101-AC	1
From Total to partial HF Condensers to AHF-Run-Down TK.800-TK-M-5907 (5 pgs)	HFC-100-AT	2
HF Liquid-Cryogenic (2 pgs)	HF-100-AT & HF-100-AT	1 2
From Total & Partial HF Condenser to HF Rundown Tanks (2 pgs)	HFC-100,102 & HFC-200-AT	2 2
From HFC-100-AT to AHF Rundown TK.800-TK-M-5908	HFC-101-AT	2
HF Transfer Lines from Rundown Tanks (2 pgs)	HFC-103/104	PRE
HF Transfer - Pump Discharge Lines (2 pgs)	HFC-105/106	PRE
From Run-Down Tanks 800-TK-M-59087/8	HFL-100-AD	1
From Run-Down Tanks to Existing AHF Storage Tanks	HFL-100-AD	3
Anhydrous HF Vapor (2 pgs)	HFVL-100 & HFVL-100-AG	0 1
Anhydrous HF Vapor to Hydrogen Burner	HFVL-100 & HFVL-100-AG	1 1
H_2 to H_2 Burner to Vent System (2 pgs)	HFVL-100	0
Anhydrous HF Vapor (2 pgs	HFVM-100 & HFVM-100-AG	3 1
Anhydrous HF Vapor (2 pgs)	HFVM-101 & HFVM-101-AG	1 0
Start-up Vent & Reactivation Vent (2 pgs)	HFVM-102 & HFVM-102-AF	0 0
Anhydrous HF Vapor to Carbon Traps	HFVM-104-AG	0
Off-Gas from Back-up Filter to Carbon Traps (2 pgs)	HFVM-104	0
Off-Gas From Carbon Traps to HF Condensers (2 pgs)	HFVM-105,106	0

Appendix G
Sequoyah Facility
Waste Evaluation & Size Reduction/
Decontamination Facility Report
Drawings and References

SEQUOYAH FUELS PROJECT DRAWINGS		
TITLE	**DRAWING NO.**	**REV. #**
From Partial Condenser to Total Condenser (2 pgs)	HFVM-108,109 & HFVM-108,108-AG	1 1
Anhydrous HF Vapor	HFVM-110-AG	1
Breathing Air System (2 pgs)	BA-1 & BA-1-AM	1 2
Condensate Drains from Autoclaves (4 pgs)	CLT-100, 101,113,114 & CLT-100-AJ	1 1 ? 0
Condensate Vent to Atmos. (2 pgs)	CLT-102 & CLT-102-AJ	0 0
Condensate From Receiver to Cond. Holding Tanks	CLT-103-AJ	0
Condensate to Holding Tanks (2 pgs)	CLT-103-AJ	0
Condensate to Holding Pond (2 pgs)	CLT-106 & CLT-106-AJ	0
Condensate Trapsets From Autoclave Steam Feed Lines (2 pgs)	CLT-107 & CLT-107-AJ	0 0
Autoclave Samples Lines (2 pgs)	CLT-108,109	0
Autoclave Condensate Samples Lines (2 pgs)	CLT-108,109	0
Condensate Relief From Autoclaves to Atmosphere	CLT-110,111,112	2
	CLT-110,111,112-AJ	1
Cooling Water Supply-Header (2 pgs)	CWS-100-G	0
From Refrig. Unit to Partial HF Condenser	FR-100-G	1
From Existing 12" CWS 60 to Header	CWS-100-G	0
Cooling Water to Refrigeration Unit (2 pgs)	CWS-101-G	0
Cooling Water to Cooling Screw Conveyor (2 pgs)	CWS-102-G	
Cooling Water to Cooling Screw Conveyor (2 pgs)	CWS-103-G	0

Appendix G
Sequoyah Facility
Waste Evaluation & Size Reduction/
Decontamination Facility Report
Drawings and References

SEQUOYAH FUELS PROJECT DRAWINGS		
TITLE	**DRAWING NO.**	**REV. #**
Cooling Water Return Header (2 pgs)	CWS-104-G	0
Cooling Water Return From Refrigeration Unit to CWS-104-G (2 pgs)	CWS-106-G	0
Cooling Water to Plant Air Compressor (2 pgs)	CWS-107-G	0
Cooling Water From Air Compressor (2 pgs)	CWS-108-G	0
Cooling Water to Sample Coolers (2 pgs)	CWS-109,110 & CWS-109,110-G	0 0
From Exist. 3" D.A.-3 to Header	DA-100-H	0
Dissociated Ammonia	DA-100	0
Dissociated Ammonia (3 pgs)	DA-100-H	0
Dissociated Ammonia to Surge Tank (2 pgs)	DA-102,103 & DA-102,103-H	1 1
From Dissociated Ammonia Surge Tank to UF_6 Reactor (2 pgs)	DA-104-A	0
ADU SLURRY BLDG: CIVIL/GEN. ARRANGEMENT DRAWINGS		
Uranium Slurry Feed Receiving, Concrete Piers, Scab & Pump House Details	220-C-2001	2
ADU Slurry Receiving & Storage - Gen. Arrn., Plan & EL.	220-M-2001	3
Site: Undergound **- Piping** **- Burial**		
Underground Piping-Enlarged Plan A - N.E. Corner of Plant Site	110-C-189	3
Underground Piping Plan - Sheet 3	110-C-192	
Underground Piping Plan - Sheet 3	110-C-192	
Underground Piping Plan - Sheet 4	110-C-193	
Contaminated Material Burial Sequoyah Facility	110-C-1016	
SLUDGE PROCESSING		

Appendix G
Sequoyah Facility
Waste Evaluation & Size Reduction/
Decontamination Facility Report
Drawings and References

SEQUOYAH FUELS PROJECT DRAWINGS		
TITLE	**DRAWING NO.**	**REV. #**
Sludge Processing Circuit Gen. Area Plan	285-C-2412	1
Existing Site Plan		
Site Grading Plan		
Piping Layout		
6" Drisco Pipe Plan & Profile		
Misc. Piping Detail		
Loading Slab & Sump Detail Sheet		
Electrical Plan		
DEPLETED URANIUM TETRAFLUORIDE PLANT & CIVIL/STRUCTURAL DRAWINGS		
Concrete Plan - Grade Floor Slab Sht. 1	800-C-2501	1
Concrete Plan - Grade Floor Slab Sht. 2	800-C-2502	2
Concrete Autoclave & Scale Pit Foundations	800-C-2503	2
Concrete MCC Rm -- Plans Elevations & Details	800-C-2504	2
Concrete Pipe Rack Fdn., HF Pit & Trans Fdn.	800-C-2505	2
Concrete Plan-Grade Walls & Drilled Piers T.O.C. Grade Walls EL. 567'6"	800-C-2506	0
Concrete Grade Walls-Elevations & Sections	800-C-2507	2
Concrete - Storage Area Concrete Pavement	800-C-2508	2
JIB Crane Foundation Depleted UF4 Project.	800-C-2509	
Battery Rack Room & Toilet Rm Plans & Elevations	800-C-2510	
Structural Steel Platform Plans & Misc. Details	800-C-3501	2
Structural Steel Platform Plans T.O.S. EL. 581'-5-3/4", 583'-11-3/4" & 592'-8-3/4"	800-C-3502	3
Structural Steel Platform Plans T.O.S. EL. 603'-11-3/4" & 613'-11-3/4"	800-C-3503	5

Appendix G
Sequoyah Facility
Waste Evaluation & Size Reduction/
Decontamination Facility Report
Drawings and References

SEQUOYAH FUELS PROJECT DRAWINGS		
TITLE	**DRAWING NO.**	**REV. #**
Structural Steel Pipe Rack Plan & Details	800-C-3504	3
Structural Steel HF Tank Platform & Monorail Support	800-C-3505	0
Structural Steel Platform Plans Modifications	800-C-3507	0
GENERAL ARCHITECTURAL DETAILS		
Details Sheet #1	000-C-407	3
Details Sheet #1	000-C-408	6
Concrete Block Details	000-C-409	2
Temporary Construction Bldg. Interior Finish Details (Also known as Bechtel Bldg)	000-C-410	0
Interior Concrete Block & Furring Details	000-C-411	0
SITE CHARACTERIZATION REPORT DRAWINGS		
Removable Contamination Levels 1st Level of DUF4 Plant	11-1	0
Gen. Radiation Levels 1st Level of DUF4 Plant	11-1A	0
Removable Contamination Levels 2nd, 3rd, 4th & 5th Levels of DUF4 Plant	11-2	0
Gen. Radiation Levels 2nd, 3rd, 4th, & 5th Levels of DUF4 Plant	11-2A	0
Removable Contamination Levels 1st, 2nd Level Misc. Digest	11-3	0
Removable Contamination Levels 3nd Level Misc. Digest	11-4	0
Removable Contamination Levels Thorium Controlled Area	11-5	0
Gen. Radiation Levels Thorium Controlled Area	11-5A	0
Removable Contamination Levels Cell rooms, UF6 Admin & 1st Level Process Areas	11-6	0
Gen. Radiation Levels Cell Rooms, UF6 Admin. 1st Level Process Areas	11-6A	0
Removable Contamination Levels Denitration, Reduction & Hydrofluorination	11-12	0

Appendix G
Sequoyah Facility
Waste Evaluation & Size Reduction/
Decontamination Facility Report
Drawings and References

SEQUOYAH FUELS PROJECT DRAWINGS		
TITLE	**DRAWING NO.**	**REV. #**
Removable Contamination Levels Denitration, Reduction & Hydrofluorination	11-12A	0
Removable Contamination Levels 1st & 2nd Level Fluorination	11-13	0
Gen. Radiation Levels 1st & 2nd Level Fluorination	11-13A	0
Gen. Radiation Levels 3rd & 4th Level Fluorination	11-14A	0
Removable Contamination Levels 3rd & 4th Levels Fluorination	11-14	0
Removable Contamination Levels Solvent Extraction Bldg.	11-15	0
Gen. Radiation Levels Solvent Extraction Bldg.	11-15A	0

Appendix G
Sequoyah Facility
Waste Evaluation & Size Reduction/
Decontamination Facility Report
Drawings and References

REFERENCES
United States. Nuclear Regulatory Commission. Technology, Safety and Costs of Decommissioning a Reference Hexafluoride Conversion Plant. NUREG/CR-1757. Washington: GPO, 1981.
Mr. Richard Kingsley's conversation with Mr. John Ellis, September 17, 1996.
Site video taken during site visit, July 23 to July 25, 1996.
Site photographs taken during site visit, July 23 to July 25, 1996.
Sequoyah Fuels Site Characterization Report, February 2, 1996
Sequoyah Fuels Piping Specification No. 6752-N-500 Rev. 4
Chapter 16 of Sequoyah Fuels NRC License
Site Walk Downs: July 23 to July 25 and September 17 to September 20, 1996.
Sequoyah Fuels Equipment Lists
Information provided by Sequoyah Fuels employees
Interviews with Sequoyah Fuels employees
Sequoyah Fuels Process and Instrumentation Drawings
United States Nuclear Regulatory Commission. Rules and Regulations. 10CFR20.1005. Units of Radioactivity. Washington: GPO, most current revision.

Appendix H
Sequoyah Facility
Waste Evaluation & Size Reduction/
Decontamination Facility Report
Calculations

Pipe Calculations for Main Process Building

Adjusted Pipe Volume = 2 x Original Pipe Volume
Adjusted Pipe Volume = 2 x 3825 ft^3 = 7650 ft^3

Electrical Pipe Length = 20% of Original Pipe Length
Electrical Pipe Length = 0.2 x 82413 ft = 16483 ft

Electrical Pipe Surface Area = D x Π (D/2 + L)
Electrical Pipe Surface Area = 0.08 x Π (0.08/2 + 16483) = 4315 ft^2

Electrical Pipe Volume = Π x r^2 x L
Electrical Pipe Volume = Π x (0.04 ft)^2 x 16483 ft = 90 ft^3

Instrumentation Pipe Length = 30% of Original Pipe Length
Instrumentation Pipe Length = 0.3 x 82413 ft = 24724 ft

Instrumentation Pipe Surface Area = D x Π (D/2 + L)
Instrumentation Pipe Surface Area = 0.08 x Π (0.08/2 + 24724) = 1339 ft^2

Instrumentation Pipe Volume = Π x r^2 x L
Instrumentation Pipe Volume = Π x (0.04 ft)^2 x 24724 ft = 135 ft^3

Total Pipe Volume = Ajusted Pipe Volume + Electrical Pipe Volume + Instrumentation Pipe Volume
Total Pipe Volume = 7650 ft^3 + 90 ft^3 + 135 ft^3 = 7875 ft^3

Pipe Calculations for Solvent Extraction Building

Adjusted Pipe Volume = 2 x Original Pipe Volume
Adjusted Pipe Volume = 2 x 946 ft^3 = 1892 ft^3

Electrical Pipe Length = 20% of Original Pipe Length
Electrical Pipe Length = 0.2 x 17049 ft = 3410 ft

Electrical Pipe Surface Area = D x Π (D/2 + L)
Electrical Pipe Surface Area = 0.08 x Π (0.08/2 + 3410) = 893 ft^2

Electrical Pipe Volume = Π x r^2 x L
Electrical Pipe Volume = Π x (0.04 ft)^2 x 3410 ft = 19 ft^3

Appendix H
Sequoyah Facility
Waste Evaluation & Size Reduction/
Decontamination Facility Report
Calculations

Instrumentation Pipe Length = 30% of Original Pipe Length
Instrumentation Pipe Length = 0.3 x 17049 ft = 5115 ft

Instrumentation Pipe Surface Area = D x Π (D/2 + L)
Instrumentation Pipe Surface Area = 0.08 x Π (0.08/2 + 5115) = 1339 ft^2

Instrumentation Pipe Volume = Π x r^2 x L
Instrumentation Pipe Volume = Π x (0.04 ft)^2 x 5115 ft = 27 ft^3

Total Pipe Volume = Ajusted Pipe Volume + Electrical Pipe Volume + Instrumentation Pipe Volume
Total Pipe Volume = 1892 ft^3 + 19 ft^3 + 27 ft^3 = 1938 ft^3

Pipe Calculations for DUF4 Building

Adjusted Pipe Volume = 1.05 x Original Pipe Volume
Adjusted Pipe Volume = 1.05 x 506 ft^3 = 531 ft^3

Electrical Pipe Length = 30% of Original Pipe Length
Electrical Pipe Length = 0.3 x 5841 ft = 1752 ft

Electrical Pipe Surface Area = D x Π (D/2 + L)
Electrical Pipe Surface Area = 0.02 x Π (0.02/2 + 1752) = 893 ft^2

Electrical Pipe Volume = Π x r^2 x L
Electrical Pipe Volume = Π x (0.02 ft)^2 x 1752 ft = 0.6 ft^3

Instrumentation Pipe Length = 5% of Original Pipe Length
Instrumentation Pipe Length = 0.05 x 1752 ft = 292 ft

Instrumentation Pipe Surface Area = D x Π (D/2 + L)
Instrumentation Pipe Surface Area = 0.02 x Π (0.02/2 + 292) = 19 ft^2

Instrumentation Pipe Volume = Π x r^2 x L
Instrumentation Pipe Volume = Π x (0.02 ft)^2 x 292 ft = 0.1 ft^3

Total Pipe Volume = Adjusted Pipe Volume + Electrical Pipe Volume + Instrumentation Pipe Volume
Total Pipe Volume = 531 ft^3 + 0.6 ft^3 + 0.1 ft^3 = 532 ft^3

Calculations for DUF4 Structural Steel Volume

Appendix H
Sequoyah Facility
Waste Evaluation & Size Reduction/
Decontamination Facility Report
Calculations

$$\text{DUF4 Structural Steel Volume} = \frac{(\text{DUF4 Building Volume})(\text{S/X Structural Steel Volume})}{(\text{S/X Building Volume})}$$

DUF4 Structural Steel Volume = (354,220 ft^3)(3157 ft^3)/(160,380 ft^3) = 6973 ft^3

Calculation of external contamination activity

Definitions

RA	=	Maximum removable alpha contamination by area (or averaged maximum if applied to general area of building) (dpm/100cm^2)
RBG	=	Maximum removable beta-gamma contamination by area (or averaged maximum if applied to general area of building) (dpm/100cm^2)
TA	=	Total maximum removable + fixed alpha contamination (dpm/100cm^2)
TBG	=	Total maximum removable + fixed beta-gamma contamination (dpm/100cm^2)
ADJ_A	=	Ratio of Average removable alpha contamination by area (or building) to Maximum removable alpha contamination by area (or building) Averages were developed from drawings contained in Attachment II to the SFC Site Characterization Report
ADJ_BG	=	Ratio of Average removable beta-gamma contamination by area (or building) to Maximum removable beta-gamma contamination by area (or building) Averages were developed from drawings contained in Attachment II to the SFC Site Characterization Report
ADJ_DPM	=	Total adjusted removable + fixed contamination (dpm/100cm^2)
SA	=	Surface Area for the line item in database (ft^2). Note: only 25% of pipe surface area was used due to vertical pipe surfaces, and dust collection on upper portion of horizontal pipe only
CURIES	=	Activity for the line item in database (Curies)

Appendix H
Sequoyah Facility
Waste Evaluation & Size Reduction/
Decontamination Facility Report
Calculations

929.0304 = Conversion factor in cm^2/ft^2

2.22×10^{12} = Conversion factor in dpm/Ci

Calculations:

FA = 50 * RA

FB = 50 * RB

ADJ_DPM = (FA * ADJ_A) = (FBG * ADJ_BG)

CURIES = (ADJ_DPM * SA * 929.0304)/2.22×10^{12}

Cost Calculations for Concrete
Average cost for 6" and 12" deep cuts is $5 per linear feet
For a 10' by 10' square of concrete (100 ft^2), 10 linear feet must be cut
$5/linear feet x 40 linear feet = $200/100 ft^2 = $2 per ft^2

Assumptions for cost of related materials:
1. Asphalt cost is 50% of the concrete cost.
2. Block cost is equivalent to the concrete cost.
3. Transite cost is equivalent to the concrete cost.
4. Roofing cost is 150% of the concrete cost.
5. Steel flooring and corrugated metal cost is equivalent to the concrete cost.

Cost Calculations for Structural Steel
Cut 10 feet lengths with a oxygasoline torch.
Use a 5 man crew (1 operator, 2 riggers, 2 welders) at $30 per hour.
Assume the operation cuts 4 pieces per hour.
($150/hour) x (1 hr/4 pieces) x (1/10 feet) = $4 per linear feet

Cost Calculations for Pipe
Assume small pipes are packaged in 4 inch diameter bundles.
For 10 feet of a 4 inch diameter bundle,
(10 feet) x (pi) x $(2/12)^2$ = 1 ft^3

Assume the pipe cost is 33% of the structural steel cost,
(10 feet) x ($4/feet) x (0.33) = $1 per ft^3

Assume larger pipe cost is 150% of small pipe cost.

Cost Calculations for Equipment

Assume small equipment cost is equivalent to small pipe cost.
Assume medium equipment cost is equivalent to large pipe cost.
Assume large, complex equipment cost is 75% of structural steel cost.

Appendix H
Sequoyah Facility
Waste Evaluation Size Reduction/
Decontamination Facility
Calculations

Calculations of Size Reduction Cost

			Rad. Env. & Ineff.	Health & Safety	Engineering	Total	
Material Code	Material Type	Total	(50% of Total)	(10% of Total & Rad)	(30% of Total & Rad)		
Architectural Materials	Block	77527.34	38763.67	11629.101	34887.303	162807.4	162807.4
	Carbon Steel	20493.73	10246.865	3074.0595	9222.1785	43036.83	
	Stairs	8062.32	4031.16	1209.348	3628.044	16930.87	
	Corrugated Metal	368568.04	184284.02	55285.206	165855.618	773992.9	850891.5
	Handrails	5.7	2.85	0.855	2.565	11.97	
	Ladder Rails	1.44	0.72	0.216	0.648	3.024	
	Miscellaneous	19848.21	9924.105	2977.2315	8931.6945	41681.24	41696.24
	Roof	260696.82	130348.41	39104.523	117313.569	547463.3	
Asphalt Total		26510	13255	3976.5	11929.5	55671	
Concrete Total		1337709.22	668854.61	200656.383	601969.149	2809189	
Equipment Total		1026529.53	513264.765	153979.4295	461938.2885	2155712	
Miscellaneous Materials Total		370221.86	185110.93	55533.279	166599.837	777465.9	
Pipe Total		51691.2	25845.6	7753.68	23261.04	108551.5	
Structural Steel Total		221292.24	110646.12	33193.836	99581.508	464713.7	
Grand Total		3789157.65	1894578.825	568373.6475	1705120.943	7957231	
This includes materials, equipment, labor but not equipment costs.							

Appendix I
Sequoyah Facility
Waste Evaluation & Size Reduction/
Decontamination Facility Report
Equipment System Descriptions

Shot Blast System

The shot peening system blasts metal beads onto surfaces to remove contaminants. The system consists of a blast cabinet, four blast wheels, three conveyors, an abrasive handling system and a dust collection system. The blast cabinet is fabricated from 3/8" thick, 11-14% manganese steel plate. Inside the blast cabinets are four blast wheels with two upblast and two downblast actions. Two twenty feet long conveyors enter and exit the blast cabinet. The abrasive handling system is comprised of two screw conveyors in hoppers at the bottom of the blast cabinet. The spent abrasive is carried to the rear of the cabinet and deposited in an elevator. The used abrasive is carried to the top of the elevator and dumped into an airwash separator with a rotary screen for cleaning. Cleaned abrasive is discharged into an abrasive storage hopper for re-use.

The shot peening system will be used to decontaminate size reduced structural steel and corrugated metal. The material is loaded onto the twenty foot entrance conveyor that feeds into the blast cabinet. Once inside the blast cabinet, the material is bombarded with shot from the blast wheels. The material is then carried out on the twenty foot exit conveyor. The conveyors operate at five to fifteen feet per minute and use forty pounds of shot per hour. More than one pass through the system is required for effective decontamination.

Sponge Jet System

The Sponge Jet system blasts sponge media against surfaces to capture, absorb, and remove chemical and radionuclide contaminants. The low density sponge particles absorb blast energy and suppress contaminants on impact, significantly reducing bounce-back, dust, and overblast damage. The sponges are water-based urethane with 10 to 15 millimeters in effective diameter. The sponges are available in varying degrees of abrasiveness by using plastic, aluminum oxide, steel grit, staurolite and garnet media in the sponges.

The Sponge Jet system consists of a feed unit, media classifier and blast hose. The feed unit holds 150 to 200 pounds of sponge media with a continuous blast time of 30 minutes to one hour. The media classifier mechanically removes large debris and powdery residues from the sponges after each use to reduce and compact wastes. The Sponge Jet cleans surfaces at a rate of approximately 300 square feet per hour and uses 50 pounds of sponge per hour.

The Sponge Jet system will be used to clean size reduced large equipment and pipe. A blast booth will contain the size reduced materials and the blast hose. The blast booth will be equipped with a negative air machine. The feed unit and media classifier will be located outside the booth for easy access to refill the sponges. The equipment will be operated from outside the blast booth to increase worker safety.

Appendix I
Sequoyah Facility
Waste Evaluation & Size Reduction/
Decontamination Facility Report
Equipment System Descriptions

Chemical Cleaning System

The chemical cleaning system will be used to treat materials whose internal surfaces are contaminated with uranium and can not readily be treated by mechanical abrasion methods. The chemical cleaning process will be used to clean two types of material. One type is mildly contaminated materials with smooth surfaces, such as stainless steel pipe and tanks. These materials are expected to be cleaned to free release. The second type is highly contaminated materials with high internals such as small diameter pipe and tubing valves, pumps, process instrumentation sensors, and process equipment. These materials are expected to have 99% of the surface contamination removed, but cannot be free released due to monitoring constraints.

This cleaning process was developed by B&W and was tested under a DOE/METC contract. It is especially designed for treating uranium contaminated components. The process is based on the use of a chelating agent, ethylenediaminetetraacetic acid (EDTA) and other additives. The solvent has been designed to solubilize, selectively capture, and stabilize the uranium and decay products to be removed from the contaminated surfaces. This process has been designed for the internal recycling of EDTA.

Recycling is accomplished by allowing the EDTA to be recovered and the metal ions to subsequently be trapped on a selective ion exchange resin. The remaining liquids leaving the ion exchange bed are clean enough for free release to the site waste water system as uncontaminated liquids (after being collected and monitored in the effluent monitoring tanks). It may also be possible to partially reuse this water to make new cleaning solvent to mimimize the release of liquid wastes. After ion exchange resins have become saturated with uranium, they may be solidified and shipped off-site for disposal as contaminated solid waste.

The system used to apply the cleaning solution employs a simple batch soaking process with a controlled temperature cycle and controlled injection of additives for maximum removal effectiveness. Key system performance parameters are listed in Table 1 and a system schematic diagram is shown in Figure 1. The total exposure time per batch is approximately 9 hours during which time a maximum temperature of 93° is maintained for 4 hours. A typical temperature and cumulative percentage removal vs time chart is shown in Figure 2.

One cleaning vat is recommended with a working capacity of approximately 1500 gallons of cleaning solution. The tank is a horizontal trough approximately 25 feet long and 3 feet wide with U-shaped cross-section. The working depth of liquid is approximately 3 feet. It is capable of handling approximately 200 ft^3 of pipe per charge. The tank will be equipped with a circulating loop containing a pump, a heater and a cooler. The cleaning solution will be prepared in a common 500 gallon dissolver unit.

Solvent Composition	
EDTA	50 g/L
$(NH_4)_2CO_3$	20 g/L
H_20_2 (added separately)	5 g/L
pH - for Cleaning Solution	9.0
pH - for EDTA Separation	2.0
Temperature and Cycle Time	See Fig. 2
Cleaning Capacity of Solvent	~8 gm U/liter
Ion Exchange Resin Type	Macroporous Amino-Phosphoric Chelating Cation Resin

Crushing Plant

The trailer-mounted crushing plant will include a feed hopper, vibrating grizzly feeder, impact crusher, product transfer conveyor, magnetic separator, radial stacker conveyor and day bins.

The crushing plant operates at 55 standard tonnes per hour. The final product size is minimum 70% less than one inch and the moisture content varies from 0 to 24 % maximum. The feed hopper has a 20 ton capacity. The vibrating grizzly is 36" to 42" wide by 16 to 20 feet long complete with mild steel pan. The impact crusher has a horizontal rotor impact breaker and a minimum 42" feed opening. The product transfer conveyor is approximately 100 feet long and 24" wide. It is totally enclosed (dust tight) the full length of conveyor and discharge chute with portals for dust collection ducting.

The crushing plant will be used for concrete, block and asphalt. The broken material is placed in the hopper with a forklift. The rebar (if applicable) is magnetically separated from the material and collected in bin. The material enters the vibrating grizzly feeder where it is vibrated and sorted. The material then enters the impacter crusher where it is size reduced. The conveyor then carries the crushed material to the day bins.

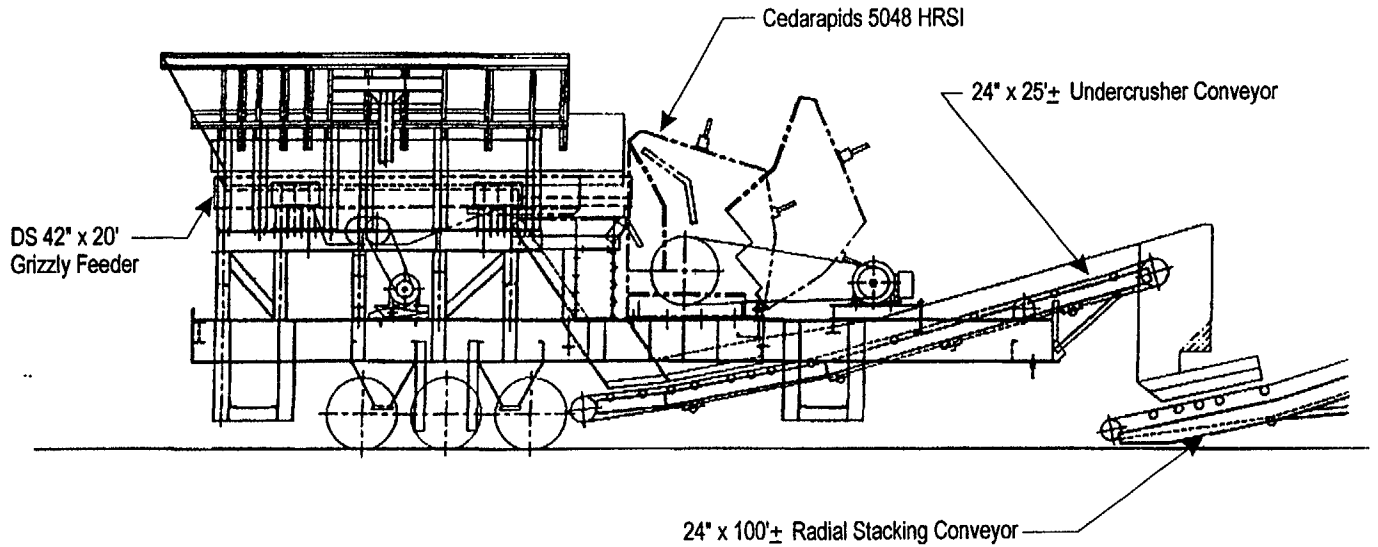


FIGURE I-1
PORTABLE CRUSHER

SEQUOYAH FACILITY
WASTE EVALUATION & SIZE
REDUCTION/DECONTAMINATION
FACILITY REPORT

B&W NESI
B&W Nuclear Environmental Services, Inc.
a McDermott company