B&W FUEL COMPANY

An American Company with Worldwide Resources

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October 15, 1990

Mr. Charles Haughney
Uranium Fuel Section
Fuel Cycle Safety Branch
Division of Industrial and
Medical Safety, NMSS
Nuclear Regulatory Commission
Washington, D.C. 20555

REFERENCE: SNM-1168 License, Docket 70-1201

Dear Mr. Haughney:

Correspondence dated September 14, 1990 informed your branch that B&W Fuel Company was constructing a facility to support upcoming field operations work. The facility, designated as SERF-3, is being constructed at the Commercial Nuclear Fuel Plant and it is our intention to operate it under our current SNM License, SNM-1168. The facility contaminants will be of byproduct material; no special nuclear material will be associated with the facility. The principal radioisotope of concern will be cobalt-60.

Due to the already existing field operations work in the SERF-1 & 2, only minor changes within the license was necessary. Most of the modifications were in the demonstration chapters. Condition 10 of our license states that the authorized place of use is at the existing facilities. We request that authorization be granted to allow the SERF-3 facility to be used as a radiation controlled facility.

The affected changes for part one and two of our license are addressed in Attachment I. Note that the possession limits do not need to be increased to support SERF-3 operations. Attachment II provides justification under 10 CFR 51.22 (c) (11) that this amendment should be eligible for categorical exclusion.

Six copies of this letter with attachments and the affected license pages dated October 15, revision 1 are included.

If you should have any questions regarding this matter or foresee any upcoming licensing problems, please feel free to call me at (804) 522-6202.

Sincerely,

B&W FUEL COMPANY
COMMERCIAL NUCLEAR FUEL PLANT

Kathryn S. Lester

Kathryn S. Lester
Manager, Health Physics & Licensing

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ATTACHMENT I

CHAPTER OF LICENSE	SECTION/PAGE	CHANGE
5	Figure 5.1/5-3	SERF-3 was added to the diagram and the new location of the perimeter fence is depicted.
7	Table 7.2/7-8	SERF-3 was added to the decommissioning plan under ancillary area & structures.
7	Appendix A/7-9	The decommissioning cost estimates were increased to include SERF-3. The increase also reflects the most recent estimate based on higher disposal costs; North Carolina rates versus South Carolina.
8		Since the SERF-3 will not decrease the effectiveness of the Radiological Contingency Plan, chapter 8, changes will be submitted upon amendment approval.
9	Figure 9.1/9-7	SERF-3 was added to the diagram and the new location of the perimeter fence is depicted.
10	10.1/10-1	Refurbishment operations supporting the liquid volume reduction/chemical cleaning process to take place in SERF-3 were included.
10	Pages 10-2 - 10-4	No changes were made to these pages. However, due to the addition of paragraphs in earlier sections the pages were repaginated.
10	10.4.1/10-9	The disposition of liquid effluents resulting from SERF-3 operations were addressed.

10	Figure 10.1/10-13	SERF-3 was added to the diagram and the new location of the perimeter fence is depicted.
12	12.15.1/12-15	Chemical cleaning and liquid volume reduction equipment was added under Field Operations equipment.
13	Figure 13.1/13-4	SERF-3 was added to the diagram and the new location of the perimeter fence is depicted.

ATTACHMENT II

10 CFR 51.22 (c) (11) states that the licensee can be granted categorical exclusion from submitting an environmental report under 51.45 if there is no significant increase in the amount of effluents, in individual exposures, no significant construction impact, and there is no significant increase in the potential for or consequences from radiological accidents. Each item is addressed separately below.

LIQUID EFFLUENTS:

There will be no increase in liquid effluents. The minimal amount of contaminated liquids generated will be solidified, and packaged under 10 CFR 61 and transported to a licensed low-level radioactive burial facility for disposition. The main source of contaminated water will be from personnel hand-washing, and routine mopping of the floor. Both result in very low levels of contaminants in the water. The processing of this waste water will result in insignificant personnel exposures.

GASEOUS EFFLUENTS:

The radiation controlled area's ventilation system will incorporate a HEPA air filtering system and the effluents will be monitored continuously for radiological contaminants. It has been determined that the levels should be comparable to those associated with the SERF-2 facility. Operational records indicate that on an average annual basis approximately 12 microcuries of byproduct material is released via the SERF-2 stack. This is based on the air samples results that were collected on a continuous basis from the start of SERF-2 operations. The annual byproduct effluents associated with SERF-1 operations released from the main stack is approximately 62.4 microcuries. If the we assume SERF-3 will contribute effluents comparable to SERF-2, the total byproduct material released to the environment from SERF-1, 2 & 3 stacks will be 84.4 microcuries. An increase of 15% will be contributed from SERF-3 operations.

Offsite annual dose calculations for the nearest resident (800 meters) due to inhalation were performed using Reg Guide 1.109 for SERF 1 & 2 effluents and SERF-3 effluents. Cobalt 60 was used as the radioisotope and both infant and adult lung and total body doses were calculated. The following table reflects the results of the calculations:

	INFANT TOTAL BODY (mrem/yr)	INFANT LUNG (mrem/yr)	ADULT TOTAL BODY (mrem/yr)	ADULT LUNG (mrem/yr)
SERF-1&2	2.9 E-7	1.2 E-4	1.7 E-6	6.7 E-4
SERF-3	4.8 E-8	1.9 E-5	2.8 E-7	1.1 E-4
TOTAL	3.38 E-7	1.39 E-4	1.98 E-6	7.8 E-4

SERF-3 effluents will increase the inhalation dose by an average of 14.0%. However, the limits are still way below the regulatory limits and the offsite dose due to uranium inhalation. The Environmental Assessment performed in conjunction with the renewal of our SNM-1168 license dated May 17, 1990, reported the dose due to uranium from inhalation as 9.72 E-2 mrem/yr for infant lung and 5.4 E-2 mrem/yr for the adult critical organ. SERF-3 operations will increase this exposure 0.002% and 0.20% respectively. Overall, the SERF-3 effluents will be insignificant to offsite exposures due to inhalation compared to the doses already received to individuals from our uranium operations.

EXTERNAL EXPOSURES:

The contaminated liquid volume reduction/ chemical cleaning system that will be refurbished in SERF-3 is mainly composed of large tanks and pumps that will be extensively flushed at the utility after job completion. Only small quantities of internal residual contamination will remain. The system will provide adequate shielding to keep dose rates very low. Consequently, the offsite external exposure should not increase significantly if at all.

CONSTRUCTION IMPACT:

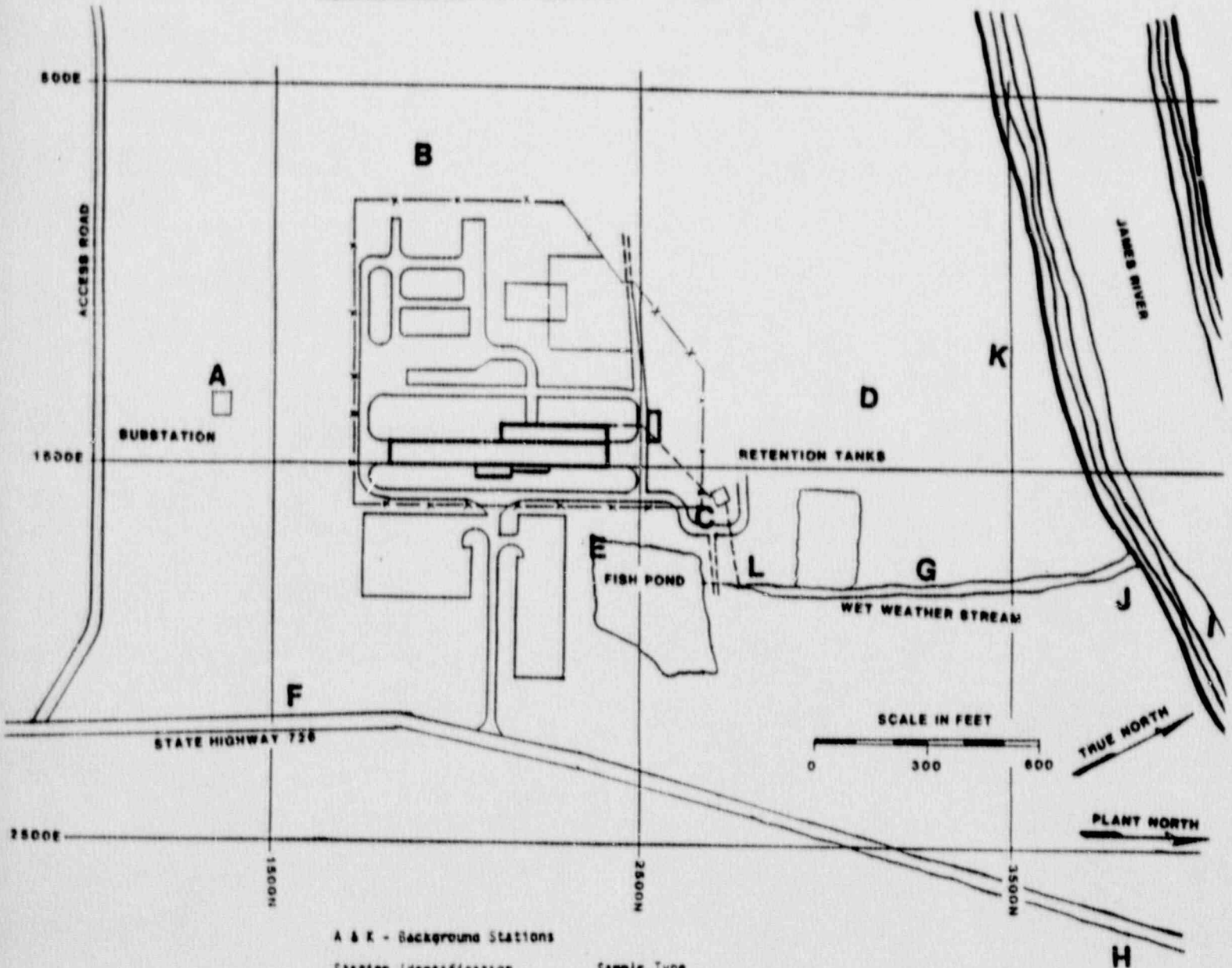
Although a new facility is being constructed to support the proposed operations, it does not impose any adverse impact on the environment. Permission to construct the facility has already been granted from the NRC and construction has begun. The construction site was already land devoted to the CNFP therefore it could not have been used except to support CNFP operations.

RADIOLOGICAL ACCIDENTS:

As stated earlier, the system is composed of large tanks and pumps slightly, internally contaminated. The potential from an accident that would release large amounts of contaminants to the environment is remote.

FIGURE 5.1

ENVIRONMENTAL MONITORING STATION DIAGRAM



A & K - Background Stations

Station Identification	Sample Type
A	Soil, Air, Vegetation, TLD
B	Soil, Vegetation, TLD
C	Air, TLD
D	Soil
E	Water, Sediment
F	Soil, Air, Vegetation, TLD
G	Soil
H	Soil, Vegetation
I	Water, Sediment
J	Water, Sediment
K	Water, Sediment
L	Water, Sediment

TABLE 7.2

CNFP Plant Area Summary

Building/Area	Contamination Potential	Contamination Level	Equipment Involved	Area Involved ft2
Main Plant Bldg.				
South Bay -SERF 1	YES	MID-HIGH	YES	5700
Pellet Vault	YES	LOW	YES	1200
Rod Loading	YES	MID-HIGH	YES	1200
Change Rooms	YES	LOW	YES	700
Rod Assbly & Fab	NO			19000
Assbly Storg & Ship	NO			8640
Machine Shop	NO			7200
Ship & Receiving/Grid	NO			10000
Offices	NO			16000
Ancillary Area & Structures				
LSA Building	YES	LOW	NO	300
Retention Tank & Line	YES	LOW	YES	300
SERF 2	YES	LOW	YES	750
Garage/Maintenance	NO			1000
Wet Weather Stream	YES	LOW	NO	24000
UF6 Cyl. Storage	YES	LOW	YES	10800
SERF-3	YES	LOW	YES	2000

APPENDIX A TO CHAPTER 7

COST AND OTHER COMMERCIAL DATA

A.1 Decommissioning Cost Estimates (in thousands of dollars)

$3,900

A.2 Estimating Guidelines

The following are the general guidelines upon which the estimates are based:

A.2.1 All contaminated areas and equipment will be decontaminated. No "mothballing" of any facility is contemplated under this estimate.

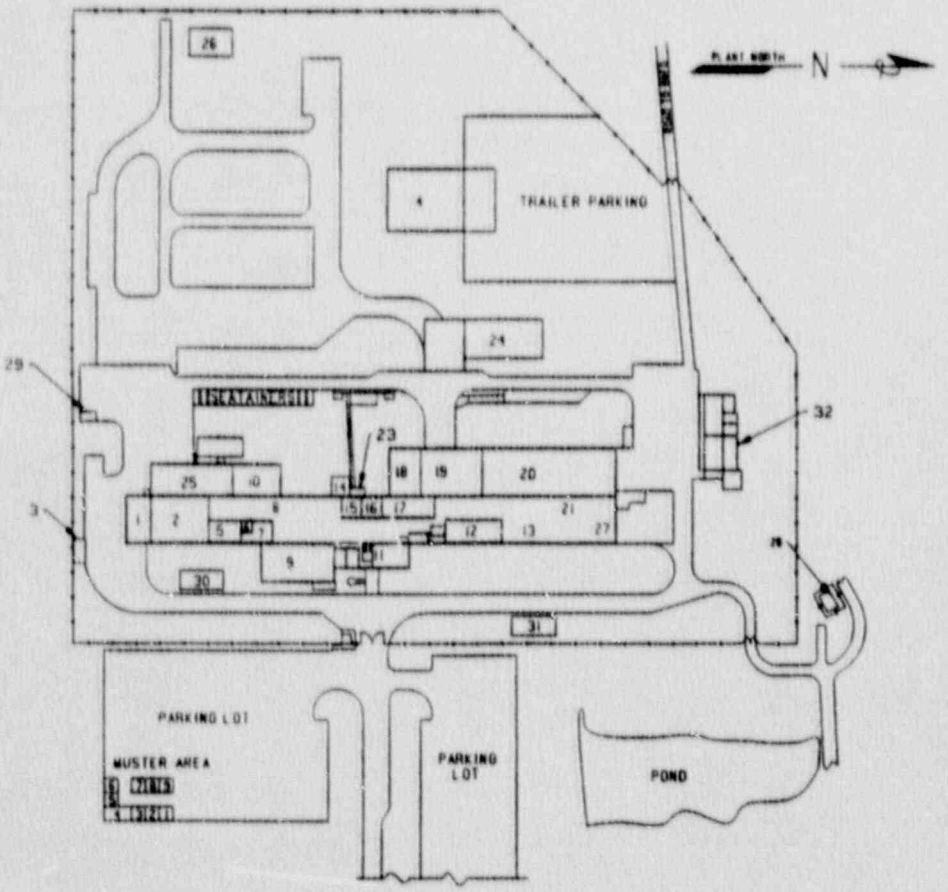
A.2.2 There is assumed to be no perpetual surveillance of unused facilities. This estimate has been developed on the basis that facilities will be released by NRC for unrestricted use.

A.2.3 "Reasonable" efforts to decontaminate below levels specified in Table 7.1 as referenced in the aforementioned Decommissioning Plans will be required only to the extent that the benefits derived clearly justify the additional cost expenditures.

A.2.4 There will be no requirement to prepare or furnish prior to, concurrent with, or subsequent to decommissioning, any environmental data or impact statements.

A.2.5 These estimates are expressed in terms of 1987 dollars. No factor for escalation has been included.

FIGURE 9.1



1. PELLET RECEIVING
2. SERF-1
3. SERF-2
4. SERF-3
5. PELLET VAULT
6. PELLET LOADING CHANGE ROOM
7. PELLET LOADING ROOM
8. FUEL ROD FAB
9. OFFICES
10. WEST OFFICES
11. METALLURGICAL LABORATORY
12. FUEL BUNDLE ASSEMBLY
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23. ACID WASTE STORAGE
24. S1 BUILDING
25. S2 BUILDING
26. S3 BUILDING
27. FUEL ASSEMBLY SHIPPING
28. RETENTION TANKS
29. SNM SCAN BUILDING
30. TRAINING CENTER
31. RECORDS STORAGE
32. GARAGE

10.1 Plant Layout and Operations

Figure 10.1 is a layout of the CNFP illustrating the various production areas on site. The plant's primary function is the manufacture of nuclear fuel assemblies for use in commercial power reactors. These operations may be subdivided into three production phases: (Unclad SNM Handling, Fuel Rod Processing and Inspection, and Fuel Bundle Assembly). The numbers in parenthesis are taken from Figure 10.1.

The CNFP also supports the Field Operations Department for the refurbishment of contaminated equipment. The majority of the operations take place in the south bay of the facility known as the Service Equipment Refurbishment Facility (SERF-1). Refurbishment operations supporting the liquid volume reduction/chemical cleaning process will be performed in the SERF-3.

10.1.1 Unclad SNM Handling

Unclad SNM receiving, storage, and rod loading are located at the south end of the plant, as shown in Figure 10.1. The area includes pellet receiving (#1), the pellet vault (#4), and the pellet loading room (#6). Other than the laboratory (#10), this is the only part of the process in which unclad special nuclear material (SNM) is handled. The entire pellet vault/rod loading area is separated from the remainder of the plant by means of concrete block and metal walls. A slight negative pressure is maintained in this area with respect to the rest of the plant to prevent contamination spread.

10.1.2 Fuel Rod Processing and Inspection

Loaded fuel rods are processed and stored in the central portion of the plant (#7). Processing includes end cap welding, quality control inspection, cleaning (#14), helium leak testing, and accumulation of rods into groups of the number required for a fuel assembly. Rods are then stored until needed for assembly production. Individual unclad fuel pellets are processed in the laboratory (#10) which is located in this portion of the plant.

10.1.3 Fuel Bundle Assembly

Fuel rods are assembled into their final configuration (#11), checked for quality, and shipped to the customer from the north end of the plant (#12).

10.1 Plant Layout and Operations

10.1.3 Fuel Bundle Assembly

Ancillary production activities conducted within the plant consist of non-nuclear component fabrication which may be characterized as light machining and fabrication. Examples of this type of activity include grid and end cap production, incore detectors, and dimensional adjustment on vendor-supplied components.

10.2 Utilities and Support Systems

10.2.1 Electric Power

Electric power to the Mt. Athos site is provided by Appalachian Power Company. This power is supplied via a nearby electrical substation and is stepped down to 480V 3-phase, 3-wire service. A further step down to 240V, 120V, and 277V is made for lighting and general convenience power.

Backup battery power is provided for the criticality alarm, fire alarm and public address in addition to emergency lighting. The nature of our operations is such that a loss of utilities simply results in a totally safe halt in operations.

10.2.2 Compressed Air

Compressed air is utilized primarily for routine industrial purposes. We do not use any protective masks or clothing that require compressed air to maintain their effectiveness. We have a main compressor located at the north end of the CNFP that provides the compressed air for plant use. A desiccant is used to dry all plant compressed air.

10.2.3 Water

The Mt. Athos site utilizes several wells on site to obtain groundwater. The groundwater supply is stored in two 150,000 gallon tanks. Additionally, 2 - one million gallon storage tanks are maintained for service water. Typically, the CNFP uses approximately 2500 gallons per day.

10.2 Utilities and Support Systems

10.2.3 Water

A loss of water supply would not lead to any degradation of our safety systems or contribute to an accident that could release uranium to the plant or the environment.

10.3 Ventilation Systems

10.3.1 General

Airborne contamination will be maintained as far below 10 CFR 20 Appendix B limits as is practicable. Containment and isolation of areas where unclad SNM is processed in significant quantities is assured by enforcing pressure differential criteria so that such areas are negative with respect to the remainder of the plant. Air circulation within controlled areas is maintained by the use of a combination of fresh "makeup" and filtered air. The relative percentages of fresh and recycled air will be determined by air handling and tempering requirements, for example, air conditioning. Recycled air is routed through a pre-filter and is HEPA filtered before return to the operating area. Determination on the necessary number of air changes per given period of time will be based on design criteria and health physics operational experience.

10.3.2 Overall System Design

Figure 10.2 is a schematic which illustrates the configuration of the controlled area ventilation system including the relative location of sampling points, pre-filters, HEPA filters and the effluent release point. Certain design criteria have been established and maintained for this system as follows:

1. Individual HEPA filter units are installed at the rate of 1 filter/1000 CFM of air flow, or more if allowed by filter specifications (typical HEPA filter specifications are shown in Table 10.1).

2. Effluents exhausted to the environment shall be HEPA filtered.

10.3 Ventilation Systems

10.3.2 Overall System Design

3. Self-closing louvers are installed at outside air intake points to the south bay.

4. HEPA filter banks are contained in metal units specifically designed to allow:

   - Access to space between filter banks to allow in-place monitoring for defects.

   - Removal and replacement of filters from outside the housing structures with the use of "bag-out" techniques for contamination control.

   - Measurement of pressure drop.

5. Pre-filters will be used to limit duct contamination and to provide protection to the HEPA filters if necessary. Selection of single or dual prefiltration is based on filter loading potential.

6. Duct construction will be metal with sealed mechanical joints where practicable. Connections to containment units may be fabricated of flexible or semi-flexible material with joints bolted or fastened by an equally effective technique.

7. Recirculated air is first passed through pre-filters and is then HEPA filtered before reentering the area.

8. Provision for DOP testing and sampling is incorporated in the ventilation system design.

10.4 Radioactive Waste Handling

10.4.1 Liquid Wastes

Potentially contaminated liquids generated at the CNFP are controlled by means of a dedicated evaporation system. The liquid effluent is collected and allowed to evaporate (with heat if necessary) into the existing airborne effluent control system where it is HEPA filtered prior to release. The HEPA system and 10 CFR 20 airborne effluent release limits used are as described in 8.1.1. Vessels used to collect/evaporate the liquid effluent shall be inspected monthly for sludge accumulation. Any dried sludge or other solids collected from the holding/evaporation vessels will be disposed of as LSA waste.

Small quantites of contaminated liquids will be generated in the SERF-3 facility. The liquids will be solidified and packaged to meet 10 CFR 61 and transferred to a licensed low-level radioactive burial site.

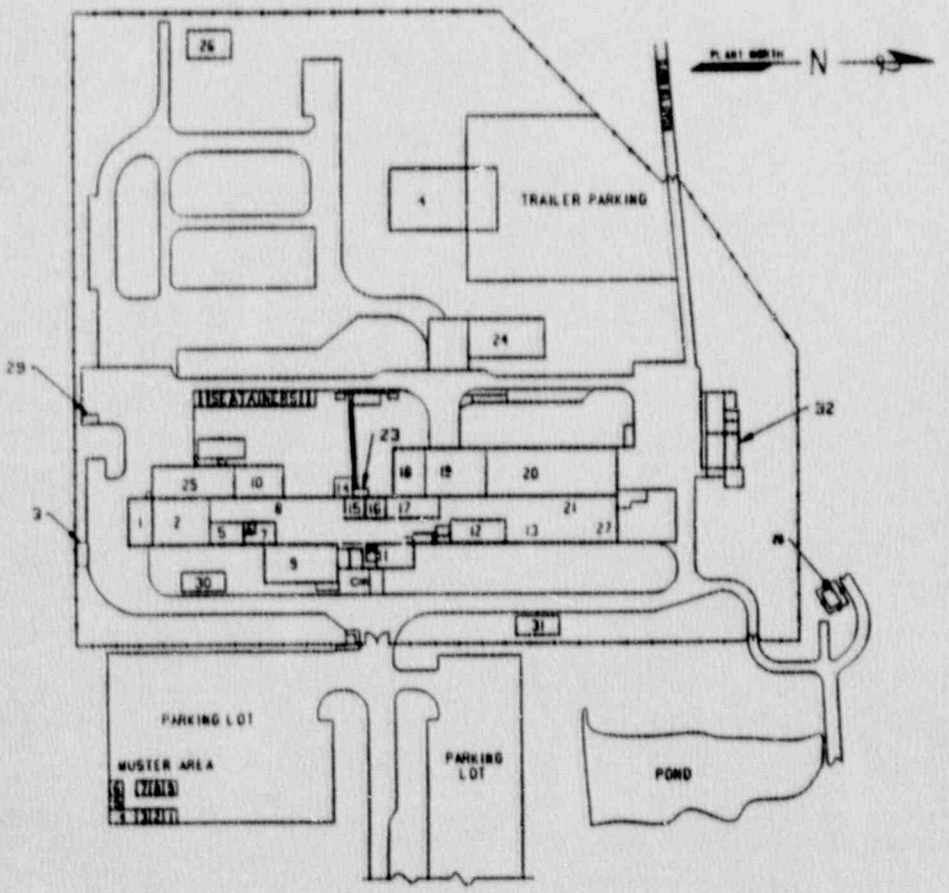
As a backup to the evaporation system, we will maintain a liquid retention tank system that will collect the contaminated liquid if necessary. The accumulated liquids in these retention tanks would be sampled, radiometrically analyzed, and treated as necessary, prior to release. The retention tank system incorporates capacity alarms, and air agitation capability. Analytical sensitivity is 1% of the applicable 10 CFR 20, Appendix B, Table II limit. The sampling program is under the control of Health-Safety and no releases are made without the prior approval of Health-Safety. The retention tanks are housed in the Rad Waste Retention Buildings shown in Figure 10.1. Figure 10.3 is a schematic of our contaminated liquid waste system.

10.4.2 Solid Wastes

Uncontrolled disposal of solid wastes or equipment is authorized when contamination levels do not exceed the levles defined in section 1.7.4 and under the concept of ALARA.

Establishment of the above contamination limits to permit disposal in accord with routine industrial

FIGURE 10.1



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12.14 Surface Contamination

Change Room	- Section 3.2.1
Protective Clothing	- Sections 12.7 and 3.2.1
Contamination Limits	- Section 3.2.6
Contamination Surveys	- Sections 12.4.1 and 3.2.6
Instrumentation	- Section 12.6

12.15 Field Operations Equipment

12.15.1 General

The CNFP may perform operations on equipment that contains by-product material contamination. This equipment in SERF-1 is typically used to perform onsite inspections at nuclear reactors. In addition to inspection equipment, SERF-3 supports chemical cleaning and liquid volume reduction equipment used at nuclear reactors.

12.15.2 Types of Equipment

The business of the CNFP includes providing field services to commercial power utilities as related to the nuclear core components. The nature of the service includes:

- Inspection of fuel and the various styles of control assemblies
- Modification and repair of the assemblies
- Reconstitution of the assemblies
- Consolidation for disposal subsequent to reactor operation.
- Chemical cleaning and liquid volume reduction for the secondary side of steam generators

The Field Operations equipment used in the field services is maintained at the CNFP for deployment to the utility sites as required. The equipment becomes contaminated with by-product materials in the course of it's use.

12.15.3 Authorized Activities

Activities authorized for the Field Operations equipment identified in 12.15.2 include: receipt, storage, inspection, decontamination, maintenance, disassembly, reassembly, testing, refurbishment, packaging, and shipping.

FIGURE 13.1

ENVIRONMENTAL MONITORING
STATION DIAGRAM