70-687
50-54

CINTICHEM, INC.
P.O. BOX 816
TUXEDO, NEW YORK 10987 (914) 351-2131

March 8, 1991

U. S. Nuclear Regulatory Commission
Document Control Desk
1 White Flint North
11555 Rockville Pike
Rockville, MD 20852

Gentlemen:

REF: (1) Cintichem Letter JJM/17.91B dated January 21, 1991
(2) NRC Meeting Minutes, Docket 50-54 and 70-687 dated March 4, 1991

The above referenced correspondence pertains to a Cintichem proposal to modify the decommissioning project whereby certain tasks may be started while reactor fuel remains on site. It was resolved in a recent meeting between NRC and Cintichem, that is documented in Reference (2), that certain modifications to the Decommissioning Plan would be required. Those modifications as listed below are hereby submitted for review and approval. The Plan sub section numbers are cross-referenced to the task item numbers that were originally proposed in Reference (1).

		Item Number*
Attachment A: Revised sub sections	3.3.1.1	1
	3.3.1.29	2
	3.3.1.21	3
	3.3.1.23	3
	3.3.1.24	3
	3.3.1.25	3
	3.3.1.27	4
	3.3.1.11A	4
	3.3.1.11	5
	3.3.1.13	5
	3.3.1.22	6
	3.3.1.15	7

Attachment B: Revised section 7.0
Attachment C: Revised Table 4.1 (Environmental Report)
Attachment D: Safety Analysis arranged by item number*
Attachment E: Revised Figure 3.1

After further review we have decided to eliminate from this proposal Tasks 6 and 7 from the "Pre-D & D Worklist (Pre-Phase II)". Task 6 can wait until the latter part of Phase II and Task 7 may be eliminated altogether based upon the most recent survey data of the areas involved.

JJM/57.91B

9103130050 910308
PDR ADOCK 05000054
P PDR

120077

NF12

Your prompt review and approval of these requested modifications are respectfully requested. We need approval of the Plan as soon as possible if we are to meet the December 31, 1992 deadline for access to waste disposal at the currently operating waste disposal facilities. The implementation of these modifications to the Plan will not result in an unsafe condition but on the contrary, by enabling timely completion of the decommissioning project and the disposal of all waste in a permanent repository, it will preclude any real or perceived risk to the public over a prolonged period.

Very truly yours,

J. J. McGovern
President/Plant Manager

JJMcG/bjc

cc: Dr. Paul J. Merges, Director
Bureau of Radiation
NYS Department of Environmental Conservation
50 Wolf Road
Albany, NY 12233-7255

Dr. Francis J. Bradley
New York State Department of Labor
One Main Street, Room 813
Brooklyn, NY 11201

Director, Technical Development Programs
State of New York Energy Office
Agency Building 2
Empire State Plaza
Albany, NY 12223

Annette Dorozynski, Supervisor
Town of Tuxedo
P. O. Box 725
Tuxedo, NY 10987

Ava Gartner
Berle, Koss and Case
145 Rockefeller Plaza
New York, NY 10111

Theodore S. Michaels
U. S. Nuclear Regulatory Commission
PDNP
Mail Stop 11-B-20
Washington, DC 20555

JJM/57.91B

Item 1

3.3.1.1 Remove Core and Systems - Task #1

This decommissioning task will entail removal of activated and/or contaminated reactor core components. The major items to be removed include: (Reference Figure 1, 9 and 12)

- o Reactor Core Support Tower;
- o Core Grid Plate;
- o Cooling Water Plenum and Flapper Valve Assembly;
- o Core Outlet Assembly (at the stall operating position);
- o Shim-rod, Regulating Rod and Fission Chamber Drive Mechanisms and Accessories;
- o Pneumatic Rabbit Tubes;
- o Thermal Column Shield Assembly.
- o Reactor Bridge
- o Beam Tube Liners

Due to the high radiation levels associated with the reactor components they will be disassembled remotely underwater. Initial disassembly of the reactor components will take place in the reactor stall. Individual components or portions of them will be stored under water in the stall and eventually either moved to the gamma pit for packaging or packaged in the stall. This will be performed such that components can be segmented to fit into HIC's sized for Cintichem's Model Nos. B-3 and BMI-1 shipping casks (or equivalents). Some slightly activated or only contaminated materials, which have lower associated dose rates may be packaged in standard LSA containers. Expected gamma dose rates on components will be verified and components will be sorted for appropriate packaging.

Before any disassembly work is started the dam will be inserted in the berm between the stall and the pool to isolate one from the other while spent fuel is in the pool. A pump will be provided to maintain water level in the pool. Water will be pumped from the stall to the storage tank to lower the level to the stall shelf. Standard operating and safety procedures will be followed for maintenance work being done from the stall shelf. Some disassembly work may have to be done by working from the stall shelf; preferably, disassembly, sorting, and packaging will be done from the top level of the stall, with the water level in the pool and stall equalized.

The reactor core will have been dismantled and all fuel will be in criticality-safe storage in the bottom of the reactor pool. All control rod drives and instrument linkages from the bridge to the core will be disconnected and removed from the stall. The core support tower will be grappled either from the building crane or from the reactor bridge (or from both) and it will be unbolted from the bridge and lowered to the stall floor. The ends of the beam tube liners will be cut as close to the bio-shield as possible and stored in the bottom of the gamma pit for future packaging and disposal.

The bridge will be lifted from the rails, removed from above the stall and set in a suitable location for disassembly, survey and disposal. The core support structure will then be disassembled in the stall remotely by unbolting or cutting (sawing) the tower lattice, the grid plate and extension, the plenum and flapper valve and the bellows. The disassembled segments or components that were close to the core and activated will be stored in the bottom of the stall for eventual packaging and shipment for disposal. Contaminated items and items that are not highly activated will be removed, characterized and packaged directly from the stall for disposal.

The core outlet assembly (spool piece) will be unbolted from the outlet pipe and packaged for disposal. The pneumatic rabbit tubes will be dismantled, segmented and packaged as radioactive waste.

The thermal column shield assembly consists of a lead and canned graphite structure, which is supported by an aluminum frame, between the reactor core and the thermal column. The activated lead shield will be grappled and then unbolted from the supporting frame. The lead shield will be moved to the canal/gamma pit for temporary storage. Dependent upon dose rates actually found on the lead shield, it will be placed into an LSA container or it will be stored in the stall for eventual packaging into a shielded container. This component will be held until a mixed waste disposal site becomes available. The canned graphite assembly will be cut open under water using a circular saw, hydraulic powered chisel and/or plasma torch. The resulting pieces of aluminum casing and graphite blocks will be sorted and placed into shipping containers.

The thermal column shield assembly stand will be removed, segmented, and packaged in a manner similar to the core support tower. The ends of the beam tube liners will be cut flush with the inner bio-shield wall and they will be stored under water in the stall until they can be characterized, packaged in shielded casks and shipped for disposal.

Item 2

3.3.1.29 Remove 5000 Gallon Tanks - Task #29

This task is to disconnect the drainage of the building 2 evaporator tank and T-1 tank room sump from discharging into the 5000 gallon (5K) tanks to reroute this discharge to mobile tanks before batch release into the industrial sewer and to remove the tanks themselves. Associated piping to these tanks will be removed during Task #32, Remove Yard Piping 3.3.1.32. The procedure for this task is as follows:

- o connect drainage pipe from T-1 evaporator tank and T-1 tank room pump to a mobile tank truck placed outside building #2;
- o install a mechanical plug in the process sewer exit pipe in an accessible point between the tanks and buildings 1 and 2;
- o drain 5000 gallon tanks;
- o excavate surrounding soil to expose tanks;
- o segment tanks;
- o check if soil is releasable.

The tanks will be drained by pumping the liquids if necessary to a temporary water treatment system. The interiors of the tanks will be hydrolazed and the bottom sludge slurried out for treatment if necessary.

The soil will be excavated to expose the tanks. The soil will be radiologically surveyed. If the soil is found contaminated, it will be packaged and sent for proper disposal. The access manhole will be surveyed, then removed. If the manhole is found contaminated, it will be decontaminated by scarification or broken into rubble, placed in LSA boxes, and shipped as contaminated concrete.

The tanks will be placed in a contamination control containment tent with portable HEPA ventilation units. The tanks will be segmented by thermal cutting and placed in LSA boxes for shipment to the off-site decontamination-recycle center/disposal facility. The soil around and below the tanks will be radiologically surveyed. If the soil is found to be contaminated, it will be placed in shipping containers and sent for disposal.

Item 3

3.3.1.21 Decontamination/Dismantling Hot Cells - Task #6

The following activities are expected to occur during this decommissioning task:

- o Erect Contamination Control Containments Above Hot Cell Access Plug Area;
- o Decontamination/Scabble Hot Cell Concrete Surfaces;
- o Remove Embedments;
- o Remove Exhaust Ducts Embedded in Walls of Hot Cells

Prior to conducting this task the following Phase One activities will have been performed:

- o Removal of Miscellaneous Debris from the Cells;
- o Preliminary Decontamination of Cell Surfaces;
- o Removal of Steel Floor and Platforms;

The surfaces will have been preliminarily decontaminated by high pressure water rinsing (hydrolasing) to reduce the dose rate within the cells to levels acceptable for decommissioning activities. This will entail removal of the 8-12 inch diameter roof plugs above the hot cells and the insertion of high pressure water lances through the plug openings. The walls, ceiling, platforms, and any other accessible surfaces will have been hydrolased with high pressure water lances. Liquids will be collected using portable sump pumps and transferred to the waste treatment facility.

Upon completion of the hydrolasing activities, and confirmation that dose rates within the cells are at acceptable levels (reduced from the tens or hundreds of R/hr to a few mR/hr range), the charging doors will be opened and the elevated floor platforms removed.

Airborne contamination control envelope enclosures will be constructed around the ceiling plug access area, above the hot cell facilities. Routine access to the cells will be via the ceiling plugs so as not to interfere with spent fuel cask movements. The underground exhaust duct will remain in operation during decommissioning activities, used to create inward air flow.

The large roof plugs will be removed, scarified, and disposed of as clean material. The walls of each hot cell will be scarified to remove surface contamination. The stainless steel floor liners will be decontaminated and removed.

ATTACHMENT A

The embedments (exhaust ducts, storage wells, conveyor ducts, windows, drains, etc.) will be exposed for removal by removing the surrounding concrete covering. The windows will be removed and the oil between the window segments drained and disposed of as non-contaminated material.

The underground exhaust duct (vitreous clay) directly below the hot cells (surrounded by concrete fill) will be exposed for removal by removing structural concrete using standard demolition methods.

Item 3 (continued)

3.3.1.23 Dismantling/Removal Underground Exhaust (Hot Cells to Primary Filter Room) - Task #21

The following activities are planned for this decommissioning task:

- o Erect Contamination Control Containments;
- o Remove Floor in Hot Cell Operating Area;
- o Remove Floor in Radiochemistry Laboratory;
- o Remove Overburden;
- o Remove Vitreous Clay Exhaust Duct.

The decontamination of surfaces within the hot cell operating area, and the radiochemistry laboratory will have been accomplished prior to commencing with this task. Protective wall/floor/ceiling coverings will be erected in the hot cell operating area, radiochem lab and on the front exposed face of the hot cells to prevent recontamination of those areas. Contamination control barriers will be erected in the exits of the hot cell operating area, and the radiochemistry laboratory. The underground exhaust duct will remain active during its removal and serve to maintain inward air flow into the enclosed area.

The floor areas immediately above the underground exhaust duct, in the hot cell operating area and radiochemistry laboratory, will be segmented using a concrete saw. The slabs will be lifted and the underside characterized for radiological contamination. If the underside of the floor is contaminated, the slabs' underside will be decontaminated via the scabbling process.

Following the removal of the floor slabs for this task, the soil overburden will be excavated and the exhaust duct exposed using a combination of a small loader and hand excavation methods. The soil will be radiologically surveyed during the removal process, and removed until soil contamination has been eliminated or until structural concerns limit further removal. (If required additional soil will be removed via Task #35).

The exhaust duct will be removed in sections and packaged for disposal. During this process the North, East, and South exterior walls of the underground (T-1) room will also be exposed and if found contaminated will be decontaminated via a scabbling process. The floor slab and soil overburden above the evaporator room will be removed after spent fuel has been removed from the facility such that a clear path remains for the fuel cask. If found contaminated, the soil will also be packaged for disposal and the concrete surfaces scarified.

ATTACHMENT A

The exhaust duct will be removed from the hot cells to where the duct passes under the building footings under the North wall of the Radiochem Lab. Removal of the remaining pipe section, primary filter room, the underground duct between the primary and polishing filter bank is discussed separately under Task #25.

Item 3 (continued)

3.3.1.24 Remove Primary Filter Room (Hot Cell Exhaust System) - Task #23

The following activities are planned to occur during this decommissioning task:

- Erect Contamination Control Containments;
- Remove Filter Room Internal Equipment;
- Decontaminate/Scabble Surfaces;
- Remove Ceilings/Walls;
- Remove Surrounding Floor Areas (Radwaste Laydown);
- Remove/Scabble Manhole in Base of Filter Room.

Contamination control containments will be erected surrounding the filter room to facilitate contamination control during the decontamination and dismantling activities. The physical removal of the filter room will occur after removal of internal equipment and the decontamination of its internal surfaces. Decontaminated structural material will be removed and disposed of as clean material and used as concrete rubble backfill during site restoration. The removal of portions of the filter room is necessary to provide access for removal of underground exhaust ducts and the manhole under the filter room.

The filter room's internal equipment (filters, holding brackets, etc.) will be removed and packaged either for disposal, or shipment to a decontamination-recycle facility. The exterior roof and wall of the filter room will be decontaminated by vacuuming, wiping, and/or surfaces removed by a scabbling processes. The internal surfaces of the filter room which are concrete will be decontaminated by scabbling. Once deemed noncontaminated, the structure of the filter room will be removed to the level of the radwaste laydown floor.

The floor of the radwaste laydown area up-stream of the filter room, immediately above the underground exhaust duct areas will be removed. The concrete foundation of the filter room will be decontaminated and removed as necessary.

The remaining vitreous clay hot cell exhaust pipe entering the manhole will be excavated and removed. Soil will be radiologically surveyed and disposed of as indicated by its contamination or lack thereof. If found, contaminated soil will be removed. The manhole will be removed intact and the surfaces scarified as necessary.

Item 3 (continued)

3.3.1.25 Dismantle Underground Hot Cell Exhaust Duct (Between Primary and Polishing Filter Rooms) - Task #25

The following activities are planned to occur during this decommissioning task:

o Remove Floor Above Duct;

o Remove Soil;

o Remove Concrete Duct.

The concrete floor above the exhaust duct (from the removed filter room area to the polishing filter room lower plenum) will be cut into manageable sized slabs and removed. The underside will be radiologically surveyed and if necessary decontaminated. If the underside of the floor slab is found to be contaminated, additional floor areas will be removed and decontaminated as is necessary.

A movable contamination control containment enclosure will be erected above the buried exhaust duct. Soil will be removed using a small loader and/or hand excavation, thereby exposing the concrete duct from the removed filter room area to the polishing filter room lower plenum. Soil will be radiologically surveyed during removal. Soil removal will continue until contamination has been eliminated. The concrete duct will be segmented using standard concrete cutting methods and removed in sections and then packaged for disposal. In the event that spent fuel remains on site, the ability for movement of the spent fuel cask through this area will be maintained. Small portable containments that can be moved out of the way will be used, and openings in the floor will be covered with plate steel or other suitable coverings.

Item 4

3.3.1.27 Decontaminate/Dismantle Emergency Storage (T-1)/Waste Treatment Facility - Task #27

The following activities are planned to occur during this decommissioning task while spent fuel is still on site:

- o Decontaminate Outer Surfaces;
- o Remove Floor Plug of Waste Treatment Facility;
- o Remove Piping/Equipment/Tanks;
- o Decontaminate/Scabble Interior Surfaces;

Inward air flow will be applied using either portable HEPA ventilation units or the normal building ventilation system, and an anteroom constructed at or below the floor plug opening or a portable containment tent. (The interior of the emergency storage (T-1) and the evaporator room will be utilized as containments.)

The old liquid waste evaporator system has been disconnected from the operational system.

The waste collection and emergency surge tank (WT-100) will be drained, desludged, segmented in place, and packaged for transport to a recycling facility. The remaining tanks, evaporators, condensers, etc. will be drained, segmented in place and packaged for transport to a decontamination recycling facility. The sump pumps and associated piping will remain in place and in operating condition.

The interior surfaces of the evaporator room and the emergency storage facility will be vacuumed, wiped, and scarified as necessary.

After spent fuel is removed from the site, the following activities are planned to complete task #27:

- o Remove sump pumps/equipment;
- o Scabble exterior walls of Emergency Storage/Waste Treatment facility.

The exterior surfaces of the evaporator and emergency storage rooms will be exposed by excavating the surrounding fill (which will be radiologically monitored and removed as contaminated material as necessary in Task #21) and scarified as necessary to remove any areas of contamination. The load bearing footing/floor structure for these rooms will not be removed until after the building demolition phase of decommissioning. When the floor slabs are removed, the underside of these slabs will be scarified if small areas of contamination are found to exist.

Item 5

3.3.1.11A Isolate the Reactor Pool from the Pump Room - Task #17A

This task will be accomplished to disconnect the pool and the stall piping from the pump room to allow decontamination and demolition of the pump room systems to commence while fuel is stored in the reactor pool. The following activities are expected to occur during this decommissioning task:

- o Erect a temporary primary coolant deionizer at the upper level of the reactor building adjacent to the pool or stall.
- o Commence deionizing pool water through the temporary deionizer and confirm that water quality in pool and stall can be maintained at < 5 umho conductivity and 5 < pH < 7.5.
- o Assure all penetrations in the reactor room lower level are closed and that the personnel door seal and Peele door seal are inflated.
- o Install a mechanical plug in the 10" stall exit pipe.
- o Drain core outlet pipe through the 1/2" static pressure transducer line in the orifice plate pit under the lower level reactor room floor. When the 10" line is drained install a pipe plug in the 1/2 tap to replace the 1/2" pressure transducer line.
- o Bolt a gasketed steel blank flange plate onto the 10" stall outlet pipe at the flanged end of this pipe in the orifice pit.
- o Repeat the previous three steps sequentially on the pool water return line to the stall, the pool water return line to the pool and the pool outlet line.
- o As each line is isolated with the blank flange the mechanical plug is removed and the line is refilled with pool water to assure leak-tightness of the gasketed blank flange before work commences on the next pipe.
- o Restore concrete plug over the orifice pit when all lines are isolated and the flanges are leak tight.

Item 5 (continued)

3.3.1.11 Decontaminate Reactor Pump Room - Task #17

The following activities are planned to occur during this decommissioning task while spent fuel is on site:

- o Drain piping systems (primary cooling, secondary cooling and primary purification);
- o Remove demineralizer resins;
- o Remove pipe;
- o Remove lead bricks from around demineralizer;
- o Remove demineralizer, heat exchanger and segment;
- o Remove all other equipment (pumps, valves, motors, gauges, etc.);
- o Remove lead shield in floor above valve room;
- o Cap floor drains in reactor/pump room after potential for spills is past (drain in piping will be removed in a separate sub-task);
- o Remove sump pumps and associated piping;
- o Remove sump stainless steel sump liner
- o Scabble concrete wall/floor surfaces;

The activities will start with draining of piping fluids and removal of the resins in the demineralizers. Next, all piping is removed (with the exception of the sump discharge pipe) to open work area for equipment removal. Clean and contaminated pipe will be segregated and placed in appropriate container for shipping. The lead bricks around the demineralizer will then be removed to expose the demineralizer tank. The two demineralizers, two open tanks and the primary/secondary heat exchanger will be segmented and packaged as contaminated as required. The other equipment (pumps, valves, motors, etc.) in the pump room will then be removed.

A lead shield in the floor above the valve room will be rigged, cut and removed. If contaminated, this lead shield will be sent to an off-site recycle center for decontamination. The sump in the Southeast corner of the pump room will remain operational until such time that the reactor building drains can be capped off without affecting other decommissioning activities. Next, removal of the sump pumps, piping, and stainless steel sump liner will occur. Decontamination of the concrete floors, walls, and ceiling will be performed by surface removal (scabbling). After scabbling, plastic sheets will be placed over clean areas to protect them from recontamination and the floor cut and removed to expose embedded pipe. All contaminated ducting will be removed. Clean material removed as an encumbrance and contaminated material will be segregated in different containers for disposal.

Soil will be excavated above the pump room to expose the roof. Soil and exposed concrete will be radiologically surveyed during the excavation to verify that they have not been contaminated from HUT leaks. If found contaminated, scabbling of concrete and removal of soil will be necessary for proper disposal.

After spent fuel is removed from the site, the following sub-tasks are planned to complete Task #17.

- o Remove embedded floor drains/piping;
- o Remove HVAC duct;
- o Remove pump room roof and South wall (common wall with holdup tank);
- o Remove embedded drain line in footing under South wall.

The embedded drain pipe under floor and a concrete filled abandoned primary pump suction line will be removed. Stitch core drilling around contaminated pipe/electrical penetrations will be performed to remove embedments. The pump room roof and walls will now be removed to expose potentially embedded contaminated drain lines in the walls and footings. These drain lines will be removed and packaged for proper disposal. Coring through remaining floor to check for residual contamination will occur. If conditions suggest migration of contaminants beneath the pump room floor, the floor will be segmented, lifted, and the underside radiologically surveyed. The underlying soil/fill will be surveyed and if necessary removed for disposal.

Item 5 (continued)

3.3.1.13 Remove Storage Tank - Task #9

The storage tank will be removed in the following sequence:

- o Disconnect the 8" fill/supply line;
- o Drain tank-Hydrolase interior of tank;
- o Remove above ground pipe (fill/supply and vent line);
- o Remove abandoned below ground pipe (fill/supply and heating water lines);
- o Remove tank and foundation;
- o Remove vent line.

The fill/supply line for the storage tank will be cut and both ends sealed at the point where it passes through the reactor building south wall.

The tank, fill/supply line and vent line will be removed as contaminated material. The tank foundation, underground pipes near old abandoned fill/supply line and soil will be radiologically evaluated, and if found to be contaminated, removed and packaged for disposal.

The tank will have been drained through the demineralizer system to the mall tanks. An air lock will next be installed for access to the tank. The interior walls and heating coil will be hydrolazed to remove surface contamination. If the walls are still contaminated, vacuum grit blasting may be used to remove contamination, or if vacuum blasting is determined to not be feasible, a containment tent will be erected and the tank walls segmented for removal.

Contaminated piping will be segmented in manageable sections and packaged for disposal. The pipe stubs in the wall of the reactor building will be capped and the walls stitch cored to remove the embedded pipe stubs. The wall will be patched with concrete to maintain reactor building containment integrity. Removal of the embedded pipe stubs will not be done during potentially airborne generating activities.

The tank foundation will be checked for contamination. If found contaminated, the foundation will be scarified. The vent line from the storage tank to the 28 inch exhaust header from the reactor building will be removed in manageable lengths, segmented and placed in LSA boxes for shipment to an off-site recycle center. The vent line will remain active during its removal to supply inward air flow for contamination control during the removal process. The air flow in the vent line will be throttled to maintain air flow balance in the remainder of the system.

Item 6

3.3.1.22 Decontamination/Dismantling Storage Wells (Hot Lab Building) - Task #7

The following activities are expected to occur during this task of decommissioning:

- o Erect Contamination Control Containments;
- o Decontaminate Upper Horizontal Surfaces;
- o Decontaminate Floor Areas;
- o Decontaminate Main Storage Pit;
- o Remove and Decontaminate Storage Well Plugs;
- o Decontaminate Well Surfaces;
- o Decontaminate Duct System;
- o Remove Filter Room Duct Header.

Contamination control containment barriers will be erected around the storage well area to enclose a few storage wells at any one time. The containment tents will be situated to allow movement of the spent fuel cask through the area. Using portable HEPA ventilation units inward air flow will be created. The embedded exhaust duct system will be deactivated prior to the decommissioning activities. A sump pump system for collection of decontamination water will be installed in the exhaust duct header sump. A drain line from the header to a temporary waste treatment system will be installed. The upper horizontal surfaces of this building area will be decontaminated using vacuuming and wiping methods. The surface of the floors and the top of the storage well plugs will be scarified and vacuum cleaned.

The plugs will be removed and the concrete surfaces below the floor level (axial and radial) scarified as needed. The bare concrete interior well surfaces where the well plugs mate will be scarified below the floor line, but above the storage well liner.

The main storage pit will be opened, vacuumed and wiped. Any areas with remaining contamination will be identified and decontaminated by the scabbling process.

The lower portion of the storage wells are lined with a galvanized steel liner. The steel liner surfaces of the storage wells will be cleaned using high pressure water lances. The rinse water will be collected through the embedded duct system. After all storage well liners have been decontaminated, the embedded duct system will be hydrolased from the outermost point toward the central header sump.

The vertical portion of the central header will be hydrolased, and the drain system removed from the sump area of the central duct header.

If it is found that decontamination of a portion of the storage wells proves to be ineffective, the steel liners will be removed from the storage wells, the imbedded ducts removed by drilling and splitting the concrete so that duct work can be removed for disposal. Removal of the floor structure in areas required for handling of the spent fuel shipping cask would only be performed after spent fuel has been removed from the facility.

Item 7

3.3.1.15 Remove Hold-up Tank - Task #14

The holdup tank will be removed by the following activities:

- o Drain water from tank;
- o Isolate reactor coolant system in pump room from reactor pool (if spent fuel remains on site, see Task 17A);
- o Excavate soil overburden above tank;
- o Seal pipe penetrations between hut and reactor pump room;
- o Remove concrete roof of tank;
- o Remove primary and vent pipes;
- o Decontaminate interior/exterior of tank;
- o Remove tank;
- o Remove contaminated soil.

If spent fuel remains on site, which would be stored in the reactor pool, piping between the reactor pump room, hut and storage tank would have to be isolated from the reactor pool to preclude accidental drainage (see Task 17A).

Any standing water in the tank will be drained with a temporary sump pump while the liquid radioactive waste system is still operational. Approximately 30 feet of clean soil will be excavated to expose the top and sides of the tank. The existing storm drain system in the area will be modified, sheet piling installed if required to hold back the bank, and temporary dikes installed to divert surface runoff water. A containment tent with portable HEPA filters will be constructed over the tank area. If spent fuel remains in the reactor building the mainway and any other openings to the "outside" between the pump room and hut will be closed to maintain reactor building containment. The top of the tank will be removed for access. The roof slab that is removed will be scarified on one or both sides to remove surface contamination as needed. The contaminated primary and vent pipes in the tank will be removed. Pipe stubs that pass through the common hold-up tank-pump room wall will be capped and removed during pump room removal.

The interior portions of the tank's concrete walls will be scarified to decontaminate the tank interior. The exterior portions of the walls will next be scarified as required by radiation survey.

ATTACHMENT A

The decontaminated walls and roof of the holdup tank will be removed. The portion of the walls and floor formed by bedrock if found contaminated, will be broken into rubble and placed in LSA boxes for disposal as contaminated concrete. During removal of the tank floor, the old pump suction line from the pipe pit to the reactor building South wall will be removed. A sump pump will be placed in the old pipe pit to collect any ground water that may enter the tank excavation and will be treated by the site waste treatment system.

7.0 Technical and Environmental Specifications

The Decommissioning Plan encompasses all operations to be performed following issuance of a dismantlement order through ultimate release of the facility from licensed conditions. The following Technical Specifications have been developed and included to support this plan. They will replace the current R-81 and SNM 639 License Technical Specifications. In addition, an Environmental Report has been written in order to allow the NRC to assess the environmental impacts associated with the decommissioning project. It has been included as Appendix H to this plan.

The Technical and Environmental Specifications will control conditions and set limits so that during decommissioning activities the industrial and radiation exposure to workers and the public shall be maintained ALARA and are some small fraction of the respective limits and guidelines (10 CFR 20, NIOSH, OSHA, etc.).

These Technical Specifications have been divided into the following categories:

1. Safety Limits
2. Limiting Safety System Settings
3. Engineered Safety Features
4. Surveillance Requirements
5. Administrative Controls

7.1 Safety Limits

Safety limits for the decommissioning are bounds on certain parameters important to safety which must be maintained for adequate control of the decommissioning activities. In some cases, Cintichem administrative limits may be lower than the maximum safety limits and these administrative limits will be applied to ensure that safety limits are not exceeded. The ultimate goal of the safety limits shall be to control individual and collective doses.

7.1.1 External Exposure

External Exposure for individuals in restricted areas during decommissioning shall not exceed the limits specified in 10 CFR 20.101 or 12NYCRR38, whichever is more limiting.

7.1.2 Internal Exposure

Internal Exposure from inhalation of radioactive material in air in restricted areas shall not exceed that which would result from the inhalation of the limiting quantities specified in 10 CFR 20.103.

7.1.3 Liquid Effluent Release

Liquid waste released from the site shall comply with 10 CFR 20.106.

7.1.4 Concentration of Airborne Radioactive Material in Restricted Areas:

Concentration of airborne radioactive material shall comply with 10 CFR 20.103.

7.1.5 Concentration of Airborne Radioactive Material in Unrestricted Areas:

Concentration of airborne radioactive material shall comply with 10 CFR 20.106.

7.1.6 Concentration of Airborne Non-Radioactive Contaminants:

Concentration of such contaminants shall not exceed the limits specified in the applicable industrial hygiene regulations.

7.2 Limiting Safety System Settings

Limiting Safety System Settings allow sufficient time for corrective action to ensure Safety Limits are not exceeded.

7.2.1 External Exposure:

In order to assure that employees are not exposed to levels of radiation in excess of federal and state limits, and in an attempt to keep all exposure as low as reasonably achievable, guidelines are established to assist in the management of personnel radiation exposure.

	Four Weeks	Eight Weeks	Ten Weeks
Whole Body	0.5 Rem	0.8 Rem	1.0 Rem
Extremities	7.5 Rem	10.0 Rem	12.5 Rem

If an individual's cumulative exposure reaches any guideline, steps will be taken to assure that any further exposures to that individual during that calendar quarter will occur on a planned basis only.

7.2.2 Internal Exposure:

a. Airborne Radioactivity

Radiation Work Permits (see Section 2) will be required when work is performed in areas with airborne radioactivity. Respiratory protection will be used when the airborne concentration exceeds 25% of the total MPC. Dust suppression/collection systems (as specified in the Radiation

Work Permit) will normally be required during decommissioning activities prone to generate radioactive airborne particulates.

b. Airborne Radioactivity Effluent

The limiting safety system setpoint for radioactive airborne effluent is 25% of MPC at the point of discharge.

c. Liquid Effluent Releases

The limiting safety system setting for radioactive liquid effluent is 25% of MPC at the point of discharge.

7.2.3 Pool Water Quality

While fuel is in storage in the reactor water system:

(1) the water resistivity shall be not less than 200,000 ohm-cm (>5 umho) except that for periods no longer than 21 days it may be 70,000 ohm-cm,

(2) the pH of the pool water shall be maintained between 5.0 and 7.5.

7.3 Engineered Safety Features

These are features which if modified could have a significant effect on the safety of workers or the public.

7.3.1 Radiation Monitoring Systems

For maintenance or repair, required radiation monitors may be replaced by portable or substitute instruments for periods of up to 24 hours provided the function will still be accomplished. Interruption for brief periods to permit checking or calibration is permissible.

a. Exhaust Duct ("Stack") Monitor

A stack monitor, capable of detecting particulate radioactivity, will be used to measure the total radioactive airborne concentration leaving Buildings 1 and 2. The stack monitor will be operational until the ventilation system is disabled at which time airborne radioactive effluent will be monitored as per Table 7.1.

b. Building Continuous Air Monitor

Each building in which decommissioning activities are taking place will have a continuous air monitor until the buildings are breached. It will be used to detect particulate activity. If the continuous air monitor is not operational, a portable air sampler will be operated continuously with individual samples taken every four hours. The basis of this requirement is to ensure that radioactive particulates are not present in the general area.

c. Outside Work Area Monitoring

Continuous air sampling will be conducted at each active decommissioning work area when a potential for airborne radioactivity exists.

d. Area Radiation Monitors

Area radiation monitors (fixed or portable) shall be provided to give warning for higher than expected radiation dose rates for jobs where the dose rate could exceed 100 mR/hr.

7.3.2 Emergency Electric Generator

Upon loss of commercial power, a generator will start automatically and supply emergency power to the building ventilation system and portable HEPA ventilation units.

7.3.3 Building Exhaust HEPAs

While operational, the building 1 and 2 exhaust systems will have HEPA filters that are certified by the manufacturer to be 99.97% efficient.

7.3.4 Fuel Storage

Unirradiated new fuel elements are stored in a vault-type room security area equipped with intrusion alarms in accordance with the security plan. Elements are stored upright in metal racks in which the separation between elements is a minimum of 2 inches. With such an arrangement, subcriticality is assured ("Critical Experiments With SPERT-D Fuel Elements" (July 14, 1965)).

Irradiated fuel is stored upright under water in the storage pool within the reactor building in criticality-safe racks. Each rack accommodates 16 elements in wells with center-to-center spacing of 6 inches. "Supplementary Information to Final Hazards Summary Report" (April 28, 1961) states that an infinite number of elements so stored would be subcritical. Each well has a hole at the bottom to allow the water to circulate for cooling.

7.3.5 Pool Makeup Water

While irradiated fuel is in storage the demineralized water makeup system and the emergency core spray system will be maintained in operational condition.

7.3.6 Pool Storage Integrity

While spent fuel is stored in the reactor pool the dam between the stall and the pool will be kept in place with the seals inflated at all times except while transporting radioactive waste under water between the stall and the gamma facility.

7.3.7 Area Radiation Monitors

The area radiation monitors will remain operational while spent reactor fuel is on site.

7.3.8 Criticality Alarm System

The criticality alarm system will remain operational while spent reactor fuel is on site.

7.4 Surveillance Requirements

Surveillance requirements during decommissioning activities comprise the test, calibration, and inspection activities necessary to ensure that systems, components, and instruments important to safety are operating in such manner that the monitored parameters and/or variables are maintained within the safety limits specified in 7.1.

7.4.1 Radiation Monitoring Systems

a. Definitions

Channel Calibration: A channel calibration is an adjustment of the channel so that its output responds, within acceptable range and accuracy, to known values of the parameter that the channel measures. Calibration shall encompass the entire channel, including equipment actuation, alarm, or trip.

Channel Check: A channel check is a qualitative verification of acceptable performance by observation of channel behavior.

Channel Test: A channel test is the introduction of a signal into the channel to verify that it is operable.

Reporting Interval: In all instances where the specified frequency is annual, the interval between tests is not to exceed 14 months; when semiannual, the interval should not exceed 7 months; when monthly, the interval shall not exceed 6 weeks; when weekly, the interval shall not exceed 10 days; and when daily, the interval shall not exceed 3 days.

b. While operational, the stack, continuous air monitors, and area radiation monitors shall be calibrated annually.

c. While operational, the stack, continuous air monitors, and area radiation monitors shall receive a channel test and alarm test monthly.

d. While operational, the stack, continuous air monitors, and area radiation monitors shall receive a channel check and a set point verification daily.

7.4.2 Emergency Electric Generator

While required, the ability of an emergency generator to start and run normally shall be checked weekly.

7.4.3 Radiological Environmental Monitoring

The radiological environmental monitoring program shall be conducted as specified in Table 7.1.

Basis: This section provides measurements of radiation and radioactive materials in those exposure pathways and for those radionuclides, which lead to the highest potential radiation exposures of individuals resulting from the facility decommissioning.

7.4.4 Building Exhaust HEPA

While operational, the pressure drop across the building 1 and 2 exhaust system HEPA filters will be checked weekly.

7.4.5 Reactor Pool Water Quality

While spent fuel is in storage in the pool weekly water quality tests will be performed to measure resistivity and pH.

7.5 Administrative Controls

Administrative Controls during decommissioning are the provisions relating to organization and management, procedures, recordkeeping, review and audit, and reporting necessary to assure completion of decommissioning the facility in a safe manner.

a. Responsibility

The Plant Manager shall be responsible for the completion of the decommissioning of the facility.

b. Organization

The organizational structure for management and performance of the decommissioning activities is shown in Section 1.5. The functions, responsibilities, and minimum required qualifications/experience of each position in Level I and Level II management are also detailed in Section 1.5 of the Decommissioning Plan.

c. Records and Reports

Accurate and complete records shall be maintained by Cintichem of the exposure of workers or the public to radiation in accordance with Section 2 of the Decommissioning Plan. The records will be maintained by Hoffmann-La Roche after decommissioning.

Reports pertaining to decommissioning activities shall be written and submitted to the proper authorities pursuant to Regulatory Guide 1.86.

d. Review

Responsibility for review of procedures, practices, and performance shall rest with the appropriate individuals and/or Level I or Level II management.

ATTACHMENT B

TABLE 7.1

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Exposure Pathway and/or Sample	Number of Samples and Sample Locations	Sampling and Collection Frequency	Type and Frequency of Analysis
1. AIRBORNE	1 Sample from Laurel Ridge Area (Station D)	Continuous Sampling*	Particulate sampler
	1 Sample from perimeter at gas house (Station A)	Continuous Sampling*	Particulate sampler
	1 Sample from Tuxedo Park residential area (Station C)	Continuous Sampling*	Particulate sampler
	1 Sample from Sterling Forest/ Long Meadow Rd area at Sterling Forest Maintenance Shed (Station B)	Continuous Sampling*	Particulate sampler
	1 Sample from NE site perimeter adjacent to Indian Kill Reservoir (Station E)	Continuous Sampling*	Particulate sampler

*Weekly filter change

Perform gamma isotopic analysis on each weekly particulate sample.

At the beginning of decommissioning operations, two additional monitoring stations will be located in a southerly and westerly direction from buildings 1 and 2 within the site perimeter.

2. DIRECT RADIATION	Same as No. 1 above plus the Clinton Woods residential area	Continuous**	Gamma dose. At least once per 92 days.

**With TLD change/readout at least once per 92 days.

ATTACHMENT B

TABLE 7.1 (continued)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Exposure Pathway and/or Sample	Number of Samples and Sample Locations	Sampling and Collection Frequency	Type and Frequency of Analysis
3. INGESTION			
Water	Indian Kill Inlet	Quarterly	Mixed Gamma Fission Products
	Indian Kill Outlet	Quarterly	Mixed Gamma Fission Products
	Indian Kill Outlet below sewer plant outlet	Quarterly	Mixed Gamma Fission Products
	Warwick Brook	Quarterly	Mixed Gamma Fission Products
	Sterling Lake Outlet	Quarterly	Mixed Gamma Fission Products
	Jones Spring	Quarterly	Mixed Gamma Fission Products
	Ramapo River	Quarterly	Mixed Gamma Fission Products
	Holding Pond Outlet	Quarterly	Mixed Gamma Fission Products
	Indian Kill Reservoir Water Intake	Quarterly	Mixed Gamma Fission Products
Fish	Indian Kill Reservoir Number determined at time of sampling	Spring of year after spring overturn	Mixed fission products
Benthos	Indian Kill Reservoir Number determined at time of sampling	Annually	Mixed fission products

ATTACHMENT B

TABLE 7.1 (continued)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Exposure Pathway and/or Sample	Number of Samples and Sample Locations	Sampling and Collection Frequency	Type and Frequency of Analysis
4. OTHER			
Sediment	Indian Kill Reservoir Number determined at time of sampling	Annually	Mixed fission products
Sewage Sludge	Treatment Plant	Annually	Mixed fission products
Soil	Selected sites surrounding plant	Annually	Mixed fission products

ATTACHMENT C

TABLE 4.1

CINTICHEM DECOMMISSIONING PROJECT COLLECTIVE-DOSE ESTIMATE
(person-rem)

TASK #	PERSON-REM DOSE	MAN HOURS
1	3.2×10^{1}	6400
2	8.82×10^{-1}	802
3	1.11×10^{2}	2220
4	8.4×10^{0}	2800
20	4.99×10^{1}	998
11	8.63×10^{0}	863
12	8.5×10^{0}	2833
13	6.28×10^{0}	126
19	3.23×10^{0}	650
16	9.6×10^{-2}	87
17A	1.97×10^{0}	77
17	3.58×10^{0}	1790
18	4.7×10^{0}	392
22	2.28×10^{-1}	440
24	6.61×10^{-1}	661
5	1.57×10^{1}	3140
7	2.25×10^{0}	450
21	3.41×10^{1}	3410
23	2.08×10^{1}	2080
25	4.34×10^{0}	2170
26	1.28×10^{0}	1280
27	6.38×10^{0}	3190
28	1.49×10^{0}	745
6 (canal)	2.23×10^{1}	11150
8	8.49×10^{-1}	500
9	3.2×10^{0}	3200
10	4.0×10^{-2}	40
14	4.47×10^{0}	2235
15	1.26×10^{0}	1260
30	8.02×10^{-2}	802
31	1.34×10^{0}	6700
32	3.27×10^{-3}	327
33	2.20×10^{0}	5500
36	6.2×10^{0}	6208
37	3.2×10^{-4}	32
38	6.4×10^{-4}	64
TOTAL	3.68×10^{2}	75622

ATTACHMENT D

SAFETY ANALYSIS

Accidental criticality is a major concern when handling or storing fuel. Such an accident must be considered and guarded against during the entire time that fuel is present on site.

Fuel storage conditions have been governed by operating license technical specifications that have been included in this Plan to govern fuel storage while it is on site. Such storage arrangements can accommodate an infinite quantity of fuel without achieving criticality. The reactor core has been dismantled and all fuel is now and will continue to be stored as required in the technical specification 7.3.4.

Fuel handling shall be limited to loading fuel into the shipping casks. In general, this operation involves transferring a single rack of fuel (16 assemblies) to the area where the fuel shipping cask is located. All fuel transfer operations are done according to procedures in the Reactor Regulations manual. Fuel assemblies are loaded individually into the shipping cask whereby the loading rate is governed as though it were a core loading to approach criticality. Subcritical multiplication is monitored to predict critical mass, thus loading is controlled to avoid criticality. Keno calculations that were done as part of the shipping cask safety analysis show that, if a full fuel load consisted of new assemblies containing 200 gm U-235 each, the cask load would remain subcritical.

The measured "cold-clean" critical mass of fuel with the Cintichem design is 3.234 Kg U-235. Even if a fuel storage rack were upset and all the fuel were to fall into an optimum geometry, it is not credible to achieve criticality because there would be insufficient mass in a rack. This is so even if the fuel were all new and unirradiated. We don't have that condition.

Item 1

Safety analysis of core systems removal with fuel stored in the reactor pool.

During the removal and disassembly of the core support structure described under Task #1, it is planned to have the spent reactor fuel stored in the bottom of the reactor pool. It is important to assure that this can be accomplished safely without creating a hazardous situation to workers and people offsite.

The fuel will be stored in 4 x 4 storage arrays in racks that have been authorized and used under operating license conditions. They will be stored under approximately 28 feet of water. The water level will be maintained by inserting the dam in the berm between the pool and stall and inflating the seal for water tightness. Leakage around the seal will be compensated for by pumping water from the stall to the pool as necessary. Inadvertent drainage of either the pool or the stall will be prevented by blanking off the pool and stall discharge line in the hold up tank and by closing and locking valve #121 (Reference Drawing #330A2418 enclosed). Thus the drainage paths to the Hold Up Tank, the only part of the system with substantial volume that is at a lower elevation, will be cut off.

The dam has been used over the past 30 years of service specifically for this purpose of maintaining different water levels in the pool and stall to facilitate maintenance work in and around the reactor core. Such operations have been conducted periodically over the past 30 years without incident. The amount of time that the facility will be in this condition will be limited to achieve only those operations that must be performed from the stall shelf. All other operations in Task #1 will be done from the stall parapet with the pool and stall water levels equalized. The inflatable seal on the dam is supplied with regulated high pressure air from the main site high pressure air compressor which has an auxiliary standby and back-up cylinders for emergency supply are located in the reactor building. Any leakage past the gate from the pool into the stall can be pumped back into the pool over the gate berm.

There are no other pathways for inadvertent drainage of the pool. Figures 4 and 5 are a plan view and elevation respectively of the reactor pool and stall at the upper level. The pool is built into bedrock except for the east side. This side is comprised of the berm and the dam. Except for the core coolant outlet and return pipes there are no penetrations.

During the decommissioning project there will be control of personnel access to the reactor and hot lab buildings. Only those people who need to be in the building for decommissioning operations will be allowed in. During periods when no work is in progress and the buildings are vacated, intrusion alarms shall be activated per the approved security plan.

ATTACHMENT D

The Decommissioning Technical Specifications set limits on exposure to workers and the public from direct radiation, ingestion and inhalation. Safety limits are those limits specified in 10CFR Part 20 and NYCRR 38 whichever is most limiting. To assure that safety limits are not exceeded limiting safety levels are imposed to provide a sufficient margin between action levels and the safety limits. Engineered safety features are provided to prevent anticipated causes of exposure from happening.

Storage of the fuel in the pool will not cause increased exposures from direct radiation, ingestion or inhalation. It will not interfere with the stipulated engineered safeguards. The radioactive inventory in the fuel is protected by the cladding. Cladding can be breached by either mechanical damage (scratching, etc.) or by corrosion. The fuel is stored in racks that are 30" deep. Stored fuel assemblies are protected by the storage rack except for a 2" protrusion above the top of each rack. The fueled section of each plate starts about 0.3" from the end of the plate. Damage to fuel is unlikely because the outer plates are unfueled, the storage rack handle or lifting bale extends over the top of the rack thus protecting the fuel from damage by large objects. In the unlikely event of minor mechanical damage that would crack or scratch the cladding, no significant radioactivity would be released because it has been over a year since the "newest" fuel has been operated in the core. It has been our experience that even recently irradiated fuel with scratched cladding that is in storage does not release sufficient fission products to cause either air or water contamination problems or unusual direct radiation hazards. Corrosion is unlikely to cause a fuel cladding failure because primary coolant deionization will continue while fuel is in the pool and the water quality specifications will be maintained so that conductivity will be less than 5 umho and the pH will be kept between 5.0 and 7.5, the normal operating water quality specifications.

Radiation problems associated with breached cladding generally are associated with fuel that is being operated in a core. Low levels of airborne radioactivity become evident when there are minor faults in the cladding which allow gases and iodine to escape. The predominant gaseous and iodine radioisotopes are relatively short lived and will have decayed since this fuel was operational over one year ago. Major releases of fission products are associated with catastrophic cladding failures caused by overheating and cladding meltdowns. Such failures are not credible with the fuel in the current storage condition.

In conclusion the safety analysis can be summarized as follows:

1. Changes to the Plan:

   The original task has been changed only with respect to isolating the stall from the pool while the task is being accomplished. This is necessary to assure the integrity of the fuel storage conditions in the pool. The actual work involved in removal of the core structures will be conducted as originally described in the Decommissioning Plan.

2. Changes to Worker Radiation Exposure:

   There will be no changes to worker radiation exposure as originally estimated in the Plan. Potential increase in exposure to workers due to spent fuel being on site are eliminated by providing the assurances that (1) the integrity of the pool storage is maintained (2) the area radiation monitoring is maintained and the pool water quality is maintained.

3. Changes to Environmental Releases/Public Radiation Exposure:

   There will be no changes to the exposure in off site areas as originally estimated in the Plan. The additional measures described for assuring worker exposure limitation also apply to public exposure.

4. Tech Spec Compliance/Fuel Safety Risks:

   The original Plan Technical Specifications have been augmented as follows:

   (a) Pool water quality limiting conditions have been added as Section 7.2.3.

   (b) Fuel storage specifications have been added to Engineered Safety Features as Section 7.3.4.

   (c) Pool make up water capability has been added to Engineered Safety Features as Section 7.3.5.

   (d) Pool storage integrity has been added to Engineered Safety Features as Section 7.3.6.

   (e) Area radiation monitoring has been added to Engineered Safety Features as Section 7.3.7.

   (f) Criticality alarm system has been added to Engineered Safety Features as Section 7.3.8.

   (g) Reactor pool water quality testing has been added to Engineered Safety Features as Section 7.4.5.

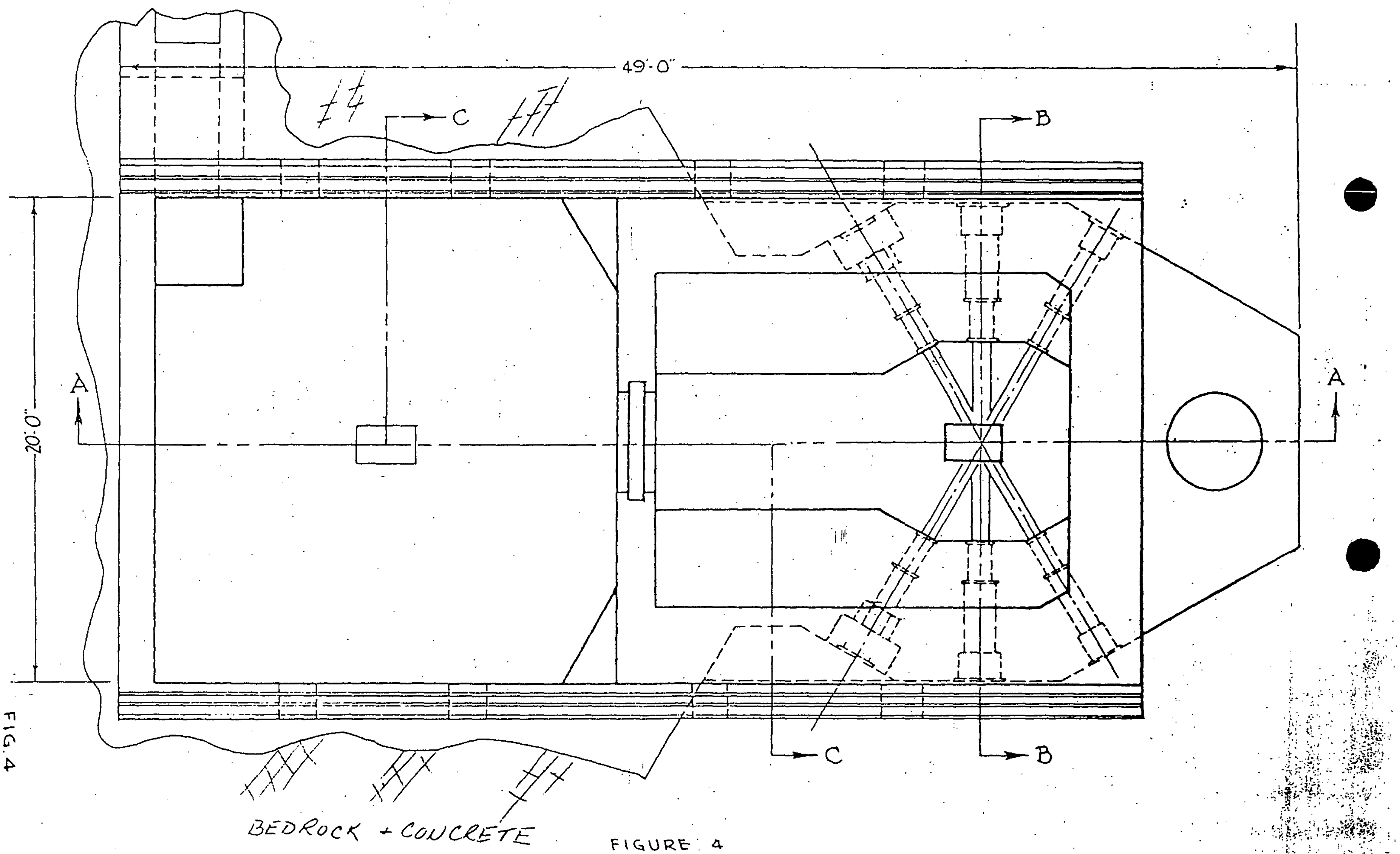
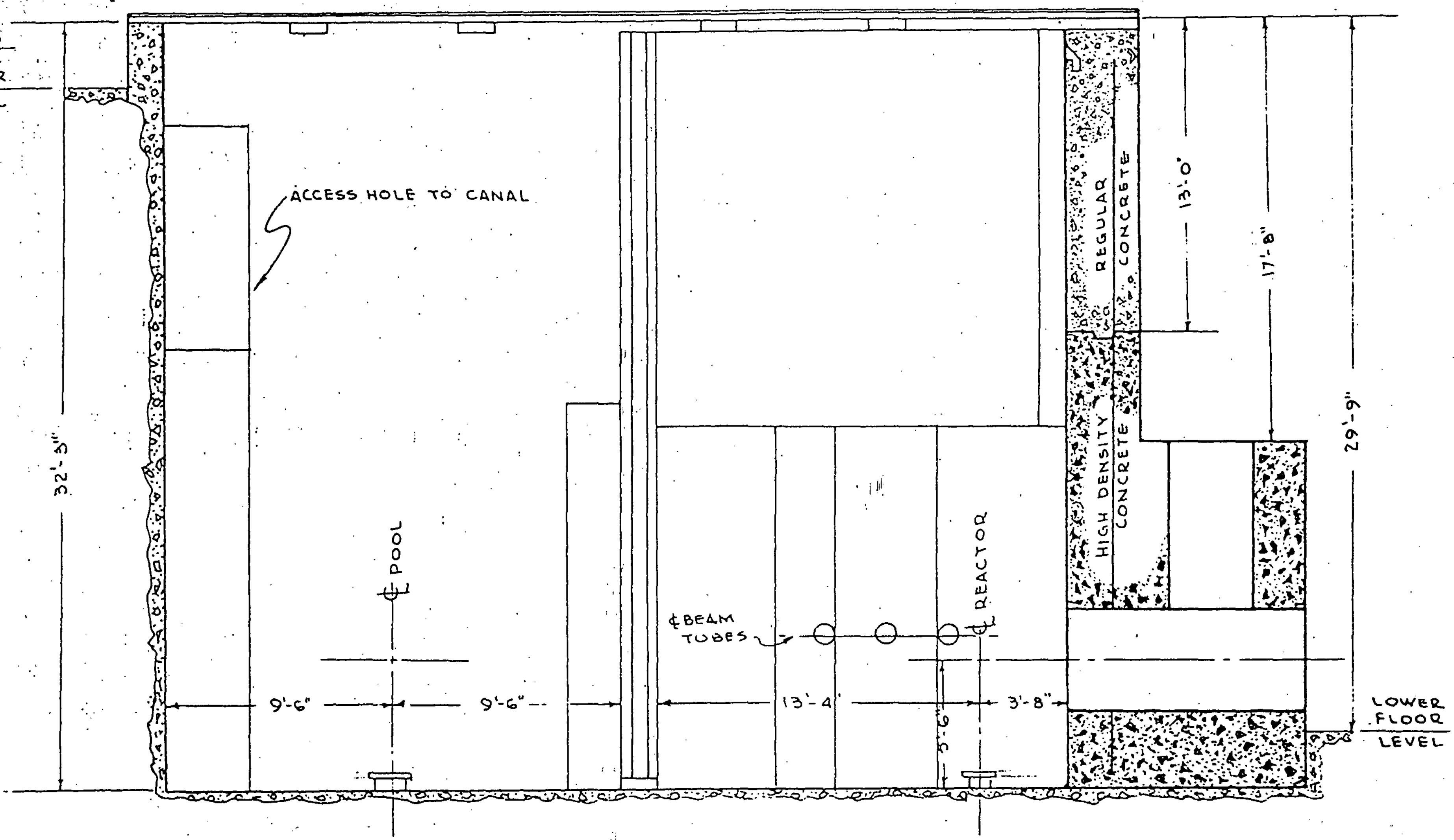


FIGURE 4

REACTOR POOL PLAN

FIG. 4

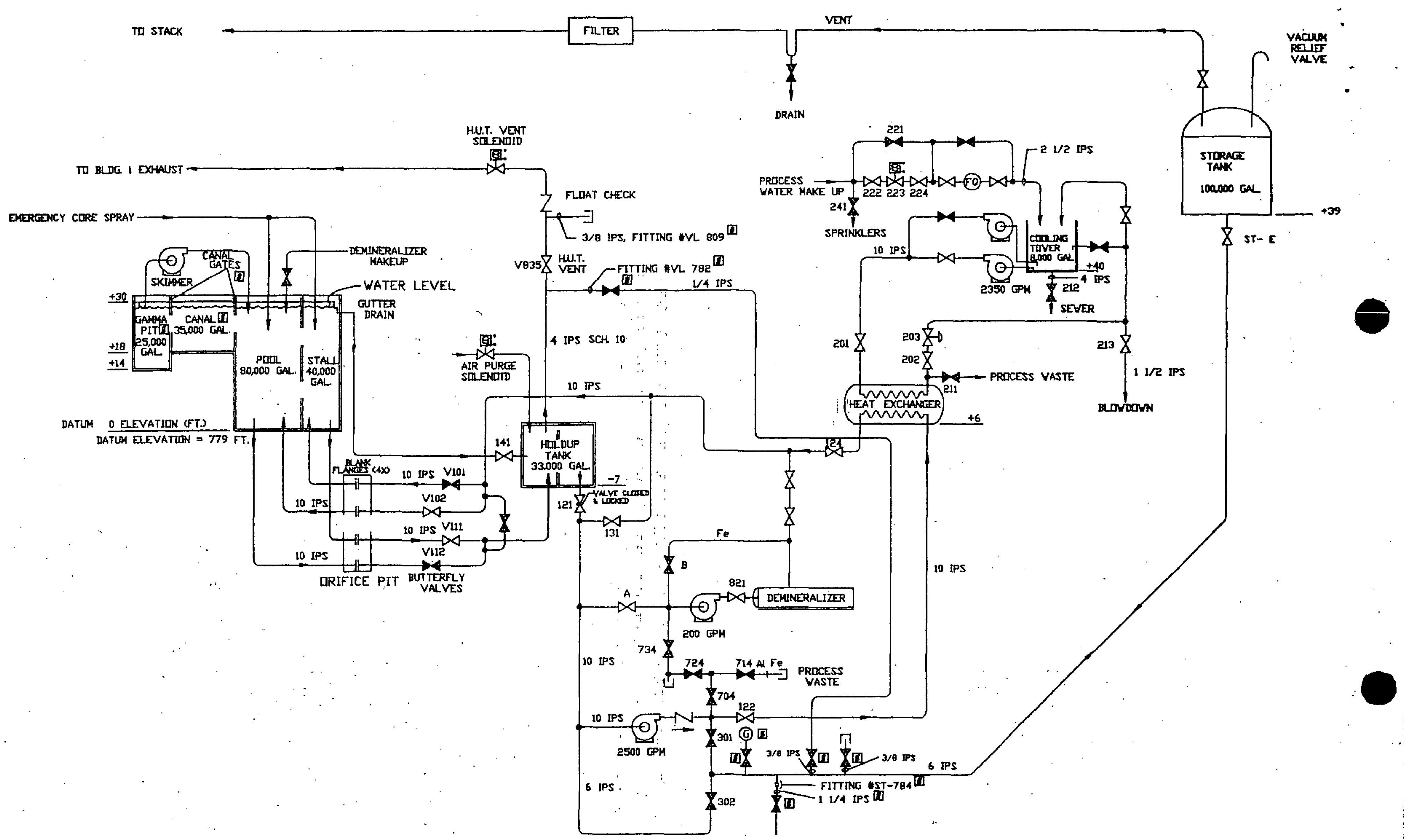


-107-

FIG. 5

FIGURE 5

REACTOR POOL- SECTION A-A



APPR.	DATE	DESCRIPTION	REV
CAD FILE # DWGS\ 2418		REVISIONS	

DRAWN CJG	2/19/91	CINTICHEM, INC. P.O. BOX 816, TUXEDO, NEW YORK 10987
DESIGN		
CHK./APPR.		
EQUIP. AT	UNLESS OTHERWISE NOTED: TOLERANCE +/− FRAC DEC ANGLE	REACTOR COOLING FLOW DIAGRAM — SIZE A — DRAWING NO. 330A2418
		SCALE — DIMENSIONS IN — SHEET

Item 2

Safety Analysis of the Removal of the 5000 Gallon Tanks
(Task #29)

1. Changes to Plan:

   The revision of this task is that it is to be accomplished ahead of the original schedule, that is, during the time spent fuel is still on site. Other than the schedule change, this task would be performed as originally described in the Decommissioning Plan.

2. Changes to Worker Radiation Exposure:

   This task will be completed with the same radiation safety considerations whether it is completed with spent fuel on site or not. The presence of spent fuel will not contribute to the exposure of workers during this task. In addition, the storage of water in mobile tanks will not contribute to worker exposure because the water is only released to tanks outside of building #2 when it is much less than MPC. These mobile tanks will be regularly surveyed for exposure levels.

3. Changes to Environmental Releases/Public Radiation Exposure:

   The change in schedule will require mobile holding tanks for evaporator condensate to replace the disconnected and removed 5000 gallon tanks. To preclude accidental release to the environment during this replacement the discharge of the T-1 sump and evaporator tank will be halted as the connection is made to the portable tank and the pipe to the 5000 gallon tanks is appropriately plugged.

4. Tech Spec Compliance/Fuel Safety Risks:

   This operation will not affect the primary water system or the movement of spent fuel off site. It will also not cause the reactor building to be breached.

Item 3

Safety Analysis of the Decontamination of Hot Cells (Task #6)

1. Changes to Plan:

   Removal of cell debris, hydrolasing and pan/platform removal are performed in Phase 1, as described in the Plan. Hydrolasing wash water will be collected with a sump pump instead of using the cell floor drains. These changes were made to facilitate performance of this task. The presence of spent fuel on site does not require that any changes be made to this task.

2. Changes to Worker Radiation Exposure:

   The D & D workers' estimated radiation exposures will not change as a result of performing this task with spent fuel on site.

3. Changes to Environmental Releases/Public Radiation Exposure:

   There will be no changes in environmental release or public radiation exposure as a result of performing this task with spent fuel on site.

4. Tech Spec Compliance/Fuel Safety Risks:

   Compliance with tech specs will not be violated or compromised. This task will be conducted solely in the hot lab building and will not cause any portion of the reactor building physical containment features to be compromised. This task will also not affect the reactor storage pool structure or systems required for maintenance of the fuel and therefore can not pose any risk to the spent fuel stored within it.

   Hot cell number one does connect with the gamma pit structure via the transfer elevator opening. The gamma pit would be used for loading of spent fuel into shipping casks. It could be postulated that a piece of equipment from hot cell one or concrete scabble debris could be dropped into the elevator opening and contaminate the canal water. Therefore, the elevator opening will be kept covered during decontamination work in hot cell one.

Item 3 (continued)

Safety Analysis of Removal of Underground Duct
(Hot Cells to Primary Filter Room)
(Task #21)

1. Changes to Plan:

   The presence of spent fuel on site does not affect the manner in which this task is performed. Therefore, this task would be performed as previously described in the Decommissioning Plan. A hold point will be added that would prevent removal of the floor or soil above the evaporator room that could affect movement of the spent fuel out of the facility.

2. Changes to Worker Radiation Exposure:

   The D & D workers' estimated radiation exposures will not change as a result of performing this task with spent fuel on site.

3. Changes to Environmental Releases/Public Radiation Exposure:

   There will be no changes in environmental releases or public radiation exposure as a result of performing this task with spent fuel on site.

4. Tech Spec Compliance/Fuel Safety Risks:

   Compliance with tech specs will not be violated or compromised. This task will be conducted solely in the hot lab building and will not cause any portion of the reactor building physical containment features to be compromised. This task will also not affect the reactor storage pool structure or system required for the maintenance of the fuel and therefore can not pose any risk to the spent fuel stored within it.

   This task will occur in the operating area and radiochem lab of the hot laboratory building. This work area is well isolated from the reactor building and any transfer path by which the spent fuel would be loaded into the shipping cask.

Item 3 (continued)

Safety Analysis of Removal of Primary Filter Room
(Task #23)

1. Changes to Plan:

   The presence of spent fuel on site does not affect the manner in which this task is performed. Therefore, there are no changes to the Decommissioning Plan.

2. Changes to Worker Radiation Exposure:

   The D & D workers' estimated radiation exposure will not change as a result of performing this task with spent fuel on site.

3. Changes to Environmental Releases/Public Radiation Exposure:

   There will be no changes in environmental releases or public radiation exposure as a result of performing this task with spent fuel on site.

4. Tech Spec Compliance/Fuel Safety Risk:

   Compliance with tech specs will not be violated or compromised.

   This task will be conducted solely in the hot lab building and will not cause any portion of the reactor building physical containment to be compromised. This task will also not affect the reactor storage pool structure and therefore can not pose any physical risk to the spent fuel stored within it. This task will be performed in the shipping area of the hot laboratory building.

Item 3 (continued)

Safety Analysis of Removal of Underground Exhaust Duct
(Primary Filter Room to Polishing Filter Room)
(Task #25)

1. Changes to Plan:

   This task would be performed in essentially the same manner as described in the Decommissioning Plan. To allow for movement of the spent fuel cask out of the building through the shipping area, moveable contamination control envelopes will be used.

2. Changes to Workers' Radiation Exposure:

   The D & D workers' estimated radiation exposure will not change as a result of performing this task with spent fuel on site. This task will be performed as described in the original October 1990 Decommissioning Plan.

3. Changes to Environmental Releases/Public Radiation Exposure:

   There will be no changes in environmental releases or public radiation exposure as a result of performing this task with spent fuel on site. The task will be performed as described in the original October 1990 Decommissioning Plan.

4. Tech Spec Compliance/Fuel Safety Risks:

   Compliance with tech specs will not be violated or compromised by performing this task.

   This task will be conducted solely in the hot lab building and will not cause any portion of the reactor building physical containment features to be compromised. This task will also not affect the reactor storage pool structure and therefore can not pose any risk to the spent fuel stored within it.

   This task will occur in the hot laboratory building's shipping area where the primary filter room is located. The primary filter room is well isolated from the reactor building and spent fuel storage area and will not pose any physical risk to the fuel. Removal of this filter room will not affect the storage pool or any systems required to support safe storage of the spent fuel.

Item 4

Safety Analysis of Decontaminate/Dismantle Emergency Storage (T-1) Waste Treatment Facility (Task #27)

1. Changes to Plan:

   The only change to the original D & D Plan is to interrupt the task after the interior surfaces are decontaminated/scabbled and complete the last two activities after spent fuel is off site. No new activities are required and the manhours to complete the task will not change appreciably.

2. Changes to Workers' Radiation Exposure:

   The D & D workers' estimated radiation exposure will not change as a result of performing this task with spent fuel on site.

3. Changes to Environmental Releases/Public Radiation Exposure:

   There will be no changes in environmental releases or public radiation exposure as a result of performing this task with spent fuel on site.

4. Tech Spec Compliance/Fuel Safety Risks:

   Compliance with tech specs will not be violated or compromised by performing this task.

   This task will be conducted solely in the hot lab building and will not cause any portion of the reactor building physical containment features to be compromised. This task will also not affect the reactor storage pool structure and therefore can not pose any risk to the spent fuel stored within it.

Item 5

Safety Analysis of Isolation of the Reactor Pool from the Pump Room (Task 17A)

In order to assure integrity of the fuel storage pool during the initial decommissioning work it is necessary to isolate the pool and stall from the rest of the primary water system to prevent inadvertent loss of water from the pool. Loss of water must be prevented during the operation of Task 17A as well as after Task 17A is completed. It is also necessary to avoid increased hazards to workers and the public and to assure that technical specifications will not be violated.

To accomplish Task 17A, an expandable plug will be inserted into each line before the line is opened. The line will then be drained through a limited opening that can be secured easily in the event of an unsuccessful plug seal is achieved initially. Only after the integrity of the expandable plug is confirmed will the orifice plate flange be opened to insert the blank gasketed flange. Prior to and during this operation all lines into the hold up tank will be either blanked off or valved and locked (i.e. pool water discharge into the hold up tank will be plugged inside the tank and valve #121 will be locked in the closed position). The hold up tank is the only point in the system that is lower than the pool that has a substantial storage volume. After the orifice plate flanges are sealed with blank flanges, the plug in the pool discharge pipe into the hold up tank can be removed. The only credible leakage in the system from the pool during this operation will be from a limited opening in the orifice plate pit which can easily be sealed and which cannot possibly drain a significant amount of water until it can be sealed. Any leakage by this pathway can easily be compensated for with the deionized water makeup and/or the core spray system thus assuring that sufficient water remains in the pool for shielding. There should be little contamination as a result of such leakage due to the fact that the radioactive concentration in the pool water is currently well below MPC. Any water leakage will drain from the orifice plate pit to the reactor building sumps via the pit floor drain. All sump water is treated by evaporation and surveyed prior to release.

The safety analysis pertaining to the performance of Task 1 while spent fuel is stored in the pool also applies to this task. The analysis of the prospects for avoiding fuel damage, cladding corrosion and criticality incidents apply to the performance of this task as well. It will be less likely to inadvertently lower the water level after the pool and stall are isolated from the rest of the coolant system as proposed in this task due to the fact that all valves and piping by which the water can drain by gravity will have been disconnected.

There may be some additional worker exposure during this task due mainly to the tasks of inserting the 10" plugs in the lines at the bottom of the pool and stall. It will be necessary to spend some time in these areas with the water level lowered. This added dose is estimated to be 1.97 person-Rem. There will be no added exposure to the public and no release to the environment as a result of this task.

In conclusion, the safety analysis can be summarized as follows:

1. Changes to the Plan:

   This task is added to the Plan to assure the integrity of the pool and stall water systems. The completion of this task will make it impossible to inadvertently drain water from the fuel storage pool through any of the plumbing in the system.

2. Changes to Worker Radiation Exposure:

   The addition of this task results in an estimated increase in worker exposure by 1.97 person Rem over 77 person hours of effort. This estimated incremental dose is not a significant increase in the overall anticipated worker dose of 368 person Rem particularly when the derived benefit is considerable.

3. Changes to Environmental Releases/Public Radiation Exposure:

   There will be no increase to the estimated public radiation exposure as a result of adding this task. Theoretically the estimated exposure off site will be reduced by the added ion exchange treatment of the pool water over the extended storage period.

4. Tech Spec Compliance/Fuel Safety Risks:

   There will be no violations of Technical Specifications resulting from the addition of this task. Some specifications have been added to the Plan as described in the safety analysis for Item 1.

Item 6

Safety Analysis of Decontamination/Dismantling Storage Wells
(Hot Lab Building)
(Task # 7)

1. Changes to Plan:

   Performance of this task with spent fuel on site would require two minor changes to the Decommissioning Plan description. Small portable contamination control tents that cover a few storage wells at a time would be used, rather than making the room one large containment enclosure. This would be required to allow movement of the spent fuel shipping cask through the area. The other change would be required if decontamination of the wells proved unsuccessful and the wells had to be demolished. If that is the case, demolition would be put on hold until the spent fuel has been shipped off site.

2. Changes to Worker Radiation Exposure:

   This task will be performed using the same methodology as described in the original Decommissioning Plan. As a result, workers' radiation exposure will not be changed.

3. Changes to Environmental Releases/Public Radiation Exposure:

   There will be no changes in environmental releases or public radiation exposure as a result of performing this task with spent fuel on site.

4. Tech Spec Compliance/Fuel Safety Risks:

   This task will be conducted solely in the hot lab building waste pit storage area. It is well isolated from the reactor building and will not cause any portion of the reactor building containment features to become compromised.

   As this task will occur in the waste pit storage area of the hot laboratory building, the work area is well isolated from the reactor building and spent fuel storage area. Decontamination of the storage wells will not involve the storage pool or any systems required to support safe storage of the spent fuel.

Item 7

Safety Analysis of Remove Hold Up Tank and Overburden
(Task #14)

1. Changes to Plan:

   This task, to be performed with spent fuel on site, is modified from the original Decommissioning Plan work scope. If spent fuel remains on site, which would be stored in the reactor pool, piping between the reactor pump room, the HUT, and storage tank would have to be isolated from the reactor pool to preclude accidental drainage of water needed for safe storage of the spent fuel.

   To maintain the physical containment features of the reactor building with spent fuel on site, this piping must be capped where it penetrates the building. The isolation and capping task is described in detail as Task 17A (an addition made to the Decommissioning Plan for D & D work with spent fuel on site). Additionally to maintain containment of the reactor building, and to allow removal of the HUT, the HUT hatch will be kept closed. This will prevent an opening to the outside from being created when the HUT and soil overburden are removed.

   Other than isolating reactor pool water systems, capping pipes and keeping the HUT hatch closed, this task will be performed in the same manner as originally described in the Decommissioning Plan.

2. Changes to Worker Radiation Exposure:

   Radiation exposure to workers' performing this task remain unchanged as a result of spent fuel being on site. However, to perform the additional work to isolate the reactor pool, workers will incur an estimated 1.97 person-rem (see Task 17A for details).

3. Changes to Environmental Releases/Public Radiation Exposure:

   There will be no changes in environmental releases or public radiation exposure as a result of performing HUT and soil overburden removal with spent fuel on site. The additional task (17A - Isolation of Reactor Pool) will not cause any environmental release of radioactive material or cause any public radiation exposure.

4. Tech Spec Compliance/Fuel Safety Risks:

To prevent compromising physical containment of the reactor building the manway opening will be kept sealed, with the existing HUT hatch, when the HUT is opened as long as fuel is on site. Any pipes that penetrate the HUT will be cut and plugged prior to opening the HUT structure. It is therefore concluded that this task can be accomplished without violating or compromising the reactor building tech spec containment features.

Safe storage of the spent fuel requires that a sufficient water level and water quality be maintained in the reactor pool. Performance of this task (see also list item five) presents a potential concern for draining the reactor pool into a breached HUT structure which could uncover the spent fuel. By isolating these lines, any possibility of causing the pool to drain by performing this task will be eliminated (see Task 17A).

Item 7 (continued)

Safety Analysis of Remove Hold Up Tank Soil - Fill (Task #15)

1. Changes to Plan:

   Performing this task with spent fuel on site does not require that any changes be made to the Decommissioning Plan.

2. Changes to Worker Radiation Exposure:

   The D & D workers' estimated radiation exposure (in the original Decommissioning Plan) will not change as a result of performing this task with spent fuel on site.

3. Changes to Environmental Releases/Public Radiation Exposure:

   There will be no changes in environmental releases or public radiation exposure as a result of performing this task with spent fuel on site.

4. Tech Spec Compliance/Fuel Safety Risks:

   This task would be performed during and/or after Task 14 (HUT/Soil Overburden Removal) is performed. As such, the same controls regarding maintenance of reactor building containment features and isolation of reactor pool water from the HUT and pump room will be maintained for this task. Therefore, this task can be accomplished without violating or compromising tech spec requirements pertaining to safe storage of spent fuel.