UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
801 WARRENVILLE ROAD
LISLE, ILLINOIS 60532-4351

October 3, 2000

Mr. Craig Jensen
Radiation Safety Officer
Battelle Memorial Institute
Columbus Operations
505 King Avenue
Columbus, OH 43201-2693

SUBJECT: NRC INSPECTION REPORT 070-00008/2000002(DNMS)

Dear Mr. Jensen:

This refers to the NRC inspection of decommissioning activities at the Battelle Columbus Laboratories Decommissioning Project (BCLDP) at your West Jefferson Site, located at West Jefferson, Ohio, which was conducted on August 29 through September 1, with continuing review to address unresolved inspection issues which concluded on September 25, 2000. Areas examined during this inspection included, Low Level Radioactive Waste Storage, Environmental Protection, Fire Protection, Emergency Preparedness, and radiological safety.

In addition to the onsite inspection, our inspectors met with the Madison County Sheriff, Jefferson Township Fire Chief, and Doctor's Hospital's Special Projects Officer, to discuss mutual agreements, emergency and security arrangements between Battelle and these organizations. Based on our interviews, the inspectors determined that Battelle and these Agencies have established and implemented programs which increase emergency preparedness and foster communication between Battelle and other stakeholders in the area.

In general, the BCLDP decommissioning activities and environmental monitoring programs in the areas inspected were performed satisfactorily. Management appeared to be properly monitoring and assessing work activities related to radiological waste management, environmental monitoring program and other activities related to radiological decommissioning.

No violations of NRC requirements were identified during the course of this inspection.

During the inspection, and a telephone conference call on September 25, 2000, we discussed concerns regarding the implementation of certain portions of the environmental monitoring program and the radioactive waste compactor maintenance program. These issues will be revisited during future inspections.

The NRC also discussed with you the August 25, 2000, License Amendment Number 23, which incorporated decommissioning and radiological protection and monitoring procedures, generated internally by the BCLDP, as NRC license requirements. This amendment also empowered Battelle staff, consisting of the Management Oversight Committee (MOC) and other applicable personnel, the authority to appropriately modify procedures as conditions change at the facility to ensure radiological safety is maintained at all times.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure**(s)** will be available **electronically** for public inspection in the NRC Public Document Room **or** from the *Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from* the NRC Web site at http://www.nrc.gov/NRC/ADAMS/index.html (the Public Electronic Reading Room).

We will gladly discuss any questions you have concerning this inspection.

Sincerely,

Bruce L. Jorgensen, Chief
Decommissioning Branch

Docket No. 070-00008
License No. SNM-7

cc R. Vandegrift, Ohio Department of Health
K.G. Green, Fire Chief, Jefferson Township Fire Department
S.V. Saltman, Sheriff, Madison County Sheriff's Department
T.A. Sindledecker, Sergeant and Specialist and Project Officer
Doctor's Hospital

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MATERIALS DECOMMISSIONING INSPECTION FIELD NOTES FOR FACILITIES NEEDING SIGNIFICANT DECOMMISSIONING EFFORT

Region:	III
Inspection Report No.:	070-00008/2000002(DNMS)
License No.:	SNM-00007
Docket No.:	070-00008
Licensee (Name & Address):	Battelle Memorial Institute Battelle Columbus Laboratories Decommissioning Project (BCLDP) West Jefferson, Ohio
Licensee Contact:	Craig L. Jensen, Radiation Safety Officer
Telephone No.:	(614) 424-5170
Last Amendment No.:	23
Date of Amendment:	August 25, 2000
Date of Last Inspection:	April 27, 2000
Date of This Inspection:	August 28-31, 2000 (On-site,), September 25, 2000 (In office review)
Date of Next Inspection:	October 2000

Type of Inspection: (X) Announced ( ) Unannounced
(X) Routine ( ) Special
( ) Initial Decomm (X) Reinspection of Decomm.

Level of Inspection: (X) Normal ( ) Reduced ( ) Extended

ML003757160

Brief Description of Inspection Activities: This was a routine decommissioning inspection performed in accordance with Battelle's Master Inspection Plan (MIP), issued on January 26, 2000. The MIP specified that the following inspection procedures were to be used for this inspection:

1. **IP84900 "Low Level Radioactive Waste Storage"(LaFranzo, Lead);**
2. **IP88045 "Environmental Monitoring" (LaFranzo, Lead);**
3. **IP88055 "Fire Protection" (McCann, Lead);**
4. **IP88050 "Emergency Preparedness" (McCann, Lead); and**
5. **IP83822 "Radiation Protection" (McCann and LaFranzo; Crombie and Denison of Ohio Department of Health in support).**

In addition to the above IP reviews, the licensee's computer modeling program, which is used for determining the activity in waste shipments, the licensee's air sampling program, and bioassay programs, was reviewed during the inspection.

During this inspection the following non-licensee emergency (fire and medical) and police organizations were visited to determine the arrangements, response times, notification procedures, and cooperative agreements between the licensee and this organization. The agencies contacted were:

1. **Madison County Sherif**
   Stephen V. Saltsman, Sheriff
   London, Ohio 43140
   (740) 852-1332

2. **Jefferson Township Fire Department**
   Kenneth A. Green, Fire Chief
   745 West Main Street
   West Jefferson, OH 43162
   (614) 879-8251

3. **Doctor's Hospital**
   Ty A. Sindledecker, Sergeant and Special Projects Officer, Safety and Security
   1087 Dennison Avenue Columbus, OH 43201-3201
   (614) 297-4186

In general the decommissioning and health physics safety practices reviewed during this inspection were being performed in a professional manner. Additionally, issues regarding the management oversight of the BCDLP Program identified during the NRC'S previous inspection appeared to have been resolved.

A minor violation was identified regarding the licensee's failure to follow compactor maintenance procedures. Specifically, some daily and monthly checks of the compactor were not performed as required. The licenseE was informed of this issue and THAT THE nrc will follow-up REGARDING THIS ISSUE during the next inspection. No immediate health and safety issues were identified regarding the failure to perform the required maintenance, and the compactor appeared to be working normally during the inspection.

Issues regarding the licensee's environmental monitoring program were also identified as follows:

(1) **Environmental Air Monitoring. Inspectors observed:**
(a) an air monitor was surrounded with vegetation which included trees and shrubs to the extend that it does not appear that a representative sample could be obtained by the sampler; and
(b) all air monitors are not at a breathing height of six feet.

(2) **Environmental Water and Sediment Monitoring. Inspectors observed:**
(a) the licensee does not appear to be sampling in the appropriate locations, in Darby creek in two locations to obtain a representative sample of either water or sediment; and
(b) the licensee does not appear to be collecting a sufficient number of samples in two locations at Darby Creek to obtain representative samples of either water or sediment.

(3) **Chain of Custody of Environmental Samples. Inspectors observed that fish samples collected do not appear to have proper documentation to ensure samples were taken as required and not tampered with prior to analysis.**

(4) **Soil samples taken outside of the site boundaries were decreased from 24 samples to 8 samples after the BCLDP Site Environmental Report for Calendar Year 1998 was issued. During the inspection, the licensee did not fully explain the reason for the decrease in the number of soil samples.**

Summary of Findings and Action:

- (X) No violations cited, clear NRC Form 591 or regional letter issued
- ( ) Violation(s), clear NRC Form 591 issued
- ( ) Violation(s), regional letter issued
- ( ) Follow up on previous violations

Inspectors

Mike McCann, M.S., Senior Decommissioning Inspector
NRC Region III, Decommissioning Branch

10/3/00
Michael LaFranzo, M.S., Decommissioning Inspector
NRC Region III, Decommissioning Branch

Accompanied By:

Joe Crombie, M.S., CHP, Ohio Department of Public Health

Eric Denison, Ohio Department of Public Health

Approved by Branch Chief:

Bruce L. Jorgensen, Chief,
Decommissioning Branch

Date: 10 - 3 - 00

1. **SUMMARY OF DECOMMISSIONING STATUS**

A.	Licensee ceased operational program.	(X) Y ( ) N
B.	Required decommissioning financial assurance mechanisms in place.	(X) Y ( ) N
C.	Decommissioning Plan (DP) required.	(X) Y ( ) N
D.	Licensee final survey required.	(X) Y ( ) N
E.	NRC confirmatory survey required.	(X) Y ( ) N
F.	NRC closeout inspection required.	(X) Y ( ) N
G.	Licensee doing decommissioning planning and preparation before dismantlement.	(X) Y ( ) N
H.	Licensee actively remediating site.	(X) Y ( ) N
I.	Licensee completed site remediation.	( ) Y (X) N

Description of Facility Status: Since the last NRC Inspection (NRC REPORT 070-00008/2000001(DNMS)), the licensee has removed a significant amount of trash and debris from the High Level Cell (HLC) and the Low Level Cell (LLC). They are continuing to reduce waste volume and package Transuranic (TRU) waste. During this inspection the licencee was preparing to transfer from the HLC (or "Berry Cans") containing TRU waste into a shipping container. The cans had exposure rates in the hundreds of roentgens per hour (R/H). Of the 10 alpha-gamma cells located in the basement area of the Hot Cell Facility (JN-1), Cells 1-6, and 8-10 have been remediated. Walk ways, and the contractor's pool which were attached to the bio-shield of the former reactor had been removed. The metal walks and steps are awaiting shipment to Aleron for processing. Active coring into the reactor bio-shield was being conducted during the inspection. The core holes are in preparation for the use of a diamond saw which will cut the reactor shield into blocks (see attached diagrams of the reactor bio-shield and cutting patterns). The reactor shield will be shipped to Envirocare, Utah. The licensee projects that the bio-shield will be removed and shipped by the end of December 2000. The licensee also indicated that the majority of the high activity waste will be removed from the hot cells by the end of calender year 2001.

The sign up sheets for the individuals present for the Entrance and Exit Meetings are attached.

2. INSPECTION OF KEY DECOMMISSIONING ACTIVITIES

A. LICENSEE ACTIVITIES INSPECTED BEFORE DISMANTLEMENT

1. Licensed material used during operations has been removed from site. ( ) Y (X) N

2. Facility license conditions are in place and met by licensee. (X) Y ( ) N

3. Site security and control of contaminated material being maintained in compliance with 10 CFR 20.1801 and 20.1802. (X) Y ( ) N

4. Support systems and services (e.g., lighting, water supply) are in place. (X) Y ( ) N

5. Decommissioning schedules are consistent with timeliness requirements in 10 CFR 30.36, 40.42, and 70.38. () Y ( ) N
This area not reviewed during this inspection.

6. Licensee's record keeping is consistent with 10 CFR 30.35, 40.36, and 70.25. () Y ( ) N
This area not reviewed during this inspection.

7. Financial assurance requirements are being maintained in accordance with 10 CFR 30.35, 40.36, and 70.25. () Y ( ) N
This area not reviewed during this inspection.

8. Licensee is conducting site characterization in accordance with applicable radiation protection procedures. () Y ( ) N
This area not reviewed during this inspection.

9. Construction of new site features (e.g., roads, rail spurs, staging areas, sediment control ponds) conforms to DP and does not compromise health and safety of workers and public. (X) Y ( ) N

10. Licensee activities conform to specific license conditions and licensee programs and procedures. (X) Y ( ) N

11. Other licensee activities: ( ) Y ( ) N

Basis for Findings: **The NRC inspectors, accompanied by the State of Ohio Inspectors, observed the Licensee's daily 7:20 a.m. Health Physics Technicians and Deconners Morning Meetings, during which the daily decommissioning, safety and radiation protection topics and issues were discussed. The inspectors, during daily walk-arounds inside the licensee's facilities, observed decommissioning work activities, such as, radiological area, equipment, and personnel surveys being performed, compaction of waste, storage of low level waste, personnel dress out PPE practices, posting, and labeling of areas and materials, and completion of logs. Decommissioning activities were being performed in JN-1, "Hot Cell Facility andJN-3 "Decommissioned Research Reactor." An outdoor soil coring in adjoining areas to JN-1 and JN-3 were also being performed as part of the licensee's decommissioning activities.**

B. LICENSEE ACTIVITIES INSPECTED DURING DECONTAMINATION, DISMANTLEMENT, AND SITE REMEDIATION

1. Site security and control of contaminated material being maintained in compliance with 10 CFR Part 20. (X) Y ( ) N

2. Decontamination and dismantlement of structures are being performed consistent with DP and sound industry practice (structures include buildings, utilities, treatment lagoons, etc.). (X) Y ( ) N

3. Decontamination and remediation of the following are being performed consistent with DP and sound industry practice:
   a. Soil (X) Y ( ) N
   b. Sediment. (X) Y ( ) N
   c. Surface waters. (X) Y ( ) N
   d. Groundwater (X) Y ( ) N
   e. Other mediums: (X) Y ( ) N

Details: **An inspector observed the licensee's compactor in use. The compactor is used to compact selective types of material which are contaminated with low levels of radioactive material. Numerous procedures were reviewed regarding the use of the compactor as well as the radiation control procedures.**

During review of maintenance procedures for the compactor, it was noted that certain daily and weekly recommended maintenance checks were not being performed. Specifically, checks of the oil level and breather caps for cleanliness on the power unit were not being performed. In addition, the inspector could not determine whether the lift gate was properly lubricated or the suction strainer was in proper working condition on the hydraulic system.

The licensee stated that they will review this area concerning procedures and recommendations and make appropriate changes to the procedures.

4. Licensee release and disposal of decommissioning wastes are consistent with DP and approved by NRC for:

   a. Liquid wastes (e.g., groundwater, surface water, liquid from treatment ponds, process liquids). (X) Y ( ) N

   b. Solid wastes (e.g., building materials, process and other facility equipment, concrete rubble, soil). (X) Y ( ) N

   c. Other wastes:

Details: The licensee's TRU waste from the Hot Cells is in the process of being packaged for shipment to the Waste Isolation Pilot Project located in Carlsbad, New Mexico. The licensee may use the Hanford Site, Washington for temporary storage until the WIPP Site is available.

5. Temporary, on-site storage of low-level radioactive wastes from decommissioning meets license conditions and guidance in IP 84890. (X) Y ( ) N

6 Packaging and shipment of radioactive waste materials meet requirements in 40 CFR Parts 173-178 and 10 CFR Part 71.() Y ( ) N
This area not reviewed during this inspection.

7. Restoration of site - Licensee has restored site to meet license conditions and NRC-approved plans. ( ) Y ( ) N

   This area not reviewed during this inspection.

8. Licensee survey of material and equipment for free release sufficient to demonstrate compliance with release criteria. ( ) Y ( ) N
This area not reviewed during this inspection.

9. Other licensee activities:

Basis for Findings: The NRC inspectors observed the licensee's low level waste storage practices and areas where materials were stored while waiting for shipment to an approved disposal site.

The inspectors walked the site perimeter fence and challenged the site surveillance systems,

i.e., closed circuit cameras, door alarms, and computer security systems. They also interviewed site security personnel, and determined that all systems and personnel were adequate for site security. The security force personnel were professional, sufficiently staffed, and well trained.

The licensee had personnel dedicated for insuring adequate emergency preparedness and fire emergencies. The licensee performs annual drills which were well documented, and professionally conducted. The licensee has written agreements with local fire, police and medical organizations for dealing with related emergencies. The licensee had established a core group of emergency responders, who were well trained. The licensee maintains an emergency call list which is updated weekly. Emergency equipment is maintained and checked at appropriate frequencies. Checklist for IP 88050 and IP88055 are attached.

C. **LICENSEE ACTIVITIES INSPECTED AFTER COMPLETION OF SITE REMEDIATION**

1. Licensee has submitted NRC Form 314 for disposition of licensed material in accordance with 10 CFR 30.36, 40.42, and 70.38. ( ) Y ( ) N
This area not reviewed during this inspection.

2. Licensee's final survey program is acceptable (see Appendix B for inspection items for final surveys). ( ) Y ( ) N
This area not reviewed during this inspection.

3. NRC confirmatory survey performed. ( ) Y ( ) N
This area not reviewed during this inspection.

4. Site maintenance activities (if any, for restricted use) conform to license conditions and NRC-approved plans and are in place and functional. ( ) Y ( ) N
This area not reviewed during this inspection.

5. Other licensee activities: ( ) Y ( ) N

Basis for Findings: Inspectors observations:

3. **INSPECTION OF STANDARD HEALTH AND SAFETY AREAS FROM THE OPERATIONAL INSPECTION PROGRAM**

A. GENERAL OVERVIEW

1. Describe the licensee's decommissioning organizational structure:

The licensee's organization was as described in the licensee's Decommissioning Plan which was tied down in Licensee Amendment 23. The RSO performs general oversight of the radiation protection program, and insures compliance with license conditions. The licensee's Radiological Technical Support Manager (RTSM), and Field Radiological Operations Manager (FROM) are responsible for the day-to-day radiation protection program.

2. Licensee is performing decommissioning activities in compliance with its approved DP. (X) Y ( ) N

3. Licensee has implemented procedures for the decommissioning activities identified in the DP. (X) Y ( ) N

4. The RSC and RSO fulfill license requirements to deal with all decommissioning activities. (X) Y ( ) N

Basis for Findings: NRC inspectors reviewed related records, procedures (RWPs, logs, and safety procedures) and interviewed health physics staff, RSO, RTSM, and FROM regarding duties and responsibilities.

B. FACILITIES

1. Describe, from field observation, the licensee-identified facilities and outdoor areas to be decommissioned:

The Inspectors were informed that the Department of Energy (DOE) and Battelle are working together to finalize the licensee's decommissioning baseline (decommissioning schedule). They projected that the revised baseline should be completed by the end of calendar year 2000.

2. The licensee's remediation plan includes all the contaminated facilities and areas on-site and off-site. (X) Y ( ) N

3. All essential systems and services (e.g., electrical power, water supply, communications systems) are in place and functional for the planned decommissioning activities. (X) Y ( ) N

4. Licensee's emergency plan is in place and operative for the duration of decommissioning. (X) Y ( ) N

5. For complex sites needing site characterization, describe the key site characterization activities to be performed by the licensee to determine the

nature and extent of contamination:
This area not reviewed during this inspection. ( ) Y ( ) N

6. Licensee's characterization activities performed in conformance with good industry practice. ( ) Y ( ) N
This area not reviewed during this inspection.

Basis for Findings: Inspectors reviewed licensee Fire Pre-Plans both on-site and at the Jefferson Township Fire Department. The Licensee Emergency Plan was reviewed and discussed with Battelle's Emergency Preparedness Staff. See the attached Emergency and Fire IP Checklists.

C. EQUIPMENT AND INSTRUMENTATION

1. Survey instruments are applicable to contaminants of interest. (X) Y ( ) N

2. Use of survey instruments appropriate for site. (X) Y ( ) N

Basis for Findings: Instrumentation observed during walk arounds. Calibration practices not reviewed during this inspection.

D. MATERIALS

1. Radioactive materials licensed during operations have been removed offsite; residual quantities conform to license conditions. (X) Y ( ) N

2. Security and control of licensed materials, including contaminated areas, is being maintained. (X) Y ( ) N

Basis for Findings: Inspectors observations.

E. TRAINING

1. Licensee has developed training program for new decommissioning activities (e.g., demolition of structures, excavation of soil); program is adequate. (X) Y ( ) N

2. Training program being effectively implemented. (X) Y ( ) N

Basis for Findings: The licensee's formal training program was not reviewed during this inspection. However, based on inspector interviews and walk around observations and

interviews, it appeared that the licensee's training program was being adequately implemented.

F. **AREA RADIATION SURVEYS AND CONTAMINATION CONTROL**

1. Area surveys are being perform (X) Y ( ) N

2. Where active remediation (e.g., demolition of structures, excavation of soil) is being performed, radiation levels in unrestricted areas do not exceed 2 mrem in any one hour. (X) Y ( ) N

Basis for Findings: Inspector observations.

G. **RADIATION PROTECTION**

1. The licensee's approved health physics program is being implemented in the field for new decommissioning activities. (X) Y ( ) N

2. Site security and control of contaminated material are in compliance with 10 CFR 20.1801 and 20.1802. (X) Y ( ) N

Basis for Findings: The inspection focused on the storage of low-level radioactive waste (LLW). The inspector noted that all LLW was secured from unauthorized access and radiation levels around the containers or rooms were less than 2 mr/hr. All individuals who had access to these areas possessed a dosimeter as required.

Inspector observations. Also, see other areas of this report.

H. **RADIOACTIVE WASTE MANAGEMENT / EFFLUENTS / ENVIRONMENTAL MONITORING**

1. Offsite disposal of decommissioning wastes conforms to free release criteria and disposal site requirements. () Y ( ) N
This area not reviewed during this inspection.

2. All new effluent releases conform to DP and applicable regulations. ( ) Y ( ) N

3. The licensee's environmental monitoring program is being implemented in conformance with the DP and all applicable limits are being met. ( ) Y ( ) N

4. Temporary storage/staging areas for radioactive wastes from building demolition, equipment dismantlement, soil excavation, etc., are adequately posted and protected. (X) Y ( ) N

Basis for Findings: The inspectors observed the licensee's staff collect air effluent samples from several stations. These stations are attached to stacks which connect to areas of the licensee's facilities which contain low to highly contaminated areas. The inspector reviewed the procedures for sample collection and noted that the licensee staff collected the samples in accordance with the procedures.

The licensee's environmental monitoring program was reviewed during the inspection. Specifically, the licensee's implementation of the procedures concerned with identifying radioactive effluent releases off-site were reviewed in selective detail. The procedures were also reviewed to determine if general guidelines regarding environmental monitoring were being implemented. During the review, six issues were identified which are related to the environmental monitoring program and are as follows:

(1) The environmental air monitoring station EA-1 was surrounded by trees and brush with a single mowed path approximately 10 feet wide leading to the monitoring station. The trees appeared to be between one and 12 inches in diameter and appeared to have been there for a significant amount of time. The inspector noted that the licensee's procedures to not address this issue.

40 CFR Part 58. Appendix E.2.4 provides guidance on spacing of trees for non-radioactive environmental monitoring programs and DOE/EH-0173T, "Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance" section 5.7.4 titled "Sampling Locations" both indicate that trees and other tall obstacles can cause absorption of particulates and disrupt the flow surrounding the monitor thereby causing the air monitoring system to collect a sample which may not be representative of radiological discharges from the site.

NRC believes that the licensee should review this aspect of the environmental air monitoring program to ensure that the licensee's air sampling techniques obtain representative air effluent samples.

(2) The placement of the air filtering collection point on four of the environmental air sampling stations was identified as a concern. Specifically, the air filtering collection point is located within a metal box with air slots on each of the four sides and an angled roof. The box is positioned on four metal legs that keep the station at about three feet off the ground. The licensee did not provide any site specific evidence that such a location was advantageous to effluent sampling.

DOE/EH-0173T, "Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance" section 5.7.4 titled "Sampling Locations" states that "Unless documented site-specific evidence exists to justify otherwise, the (air) sample(s) at each air monitoring station should be collected at a height of 2 meters above ground level (approximately the height of inhalation for adults)."

NRC believes that the licensee should review this aspect of the environmental air monitoring program to ensure that the licensee's air sampling techniques obtain representative air effluent samples.

(3) The number of water and sediment samples taken in Darby Creek may not be sufficient to obtain a representative water and sediment sample. Specifically, single water samples are taken at location designations EW-3 and EW-4 and single sediments sample locations ED-2 and ED-3. The licensee's procedure does not address specific cross stream collection points for water or sediment samples. At the time of the inspection, Darby Creek was about 40-50 feet across in most areas and, according to the licensee, depths can range from a few inches to 5-6 feet. The creek rises and falls depending on the amount of rain fall in the area.

The Environmental Protection Agency's "Environmental Investigations Standard Operating Procedures and Quality Assurance Manual" dated May 1996 states that, generally, for streams greater than 20 feet wide, at least quarter point (1/4, ½, and 3/4 width) composite samples should be collected. In addition, DOE/EH-0173T, "Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance" section 5.10.1.1 titled "Surface Water"indicates that "Samples should be taken on a traverse, at more than one depth, and at a minimum of four to six points equidistant across the stream flow."

NRC believes that the licensee should review this aspect of the environmental water and sediment monitoring program to ensure that the licensee's sampling techniques representative water and sediment samples.

(4) Independent of (3) finding, the locations of two other water and sediment samples in Darby Creek are also of concern. Darby Creek water samples EW-3 and EW-4 and Darby Creek sediment samples ED-2 and ED-3 are taken within 2-3 feet of the shoreline. The licensee's procedure does not address specific cross stream collection points of water or sediment samples.

The Environmental Protection Agency's "Environmental Investigations Standard Operating Procedures and Quality Assurance Manual" dated May 1996 indicates that if a single sample is taken, the sample should be taken at mid-depth at the center of the channel which will represent the entire cross section.

NRC believes that the licensee should review this aspect of the environmental water and sediment monitoring program to ensure that the licensee's sampling techniques representative water and sediment samples.

(5) **The chain of custody of environmental samples was identified as an area of concern. Seven environmental monitoring documents regarding the collection and analysis of fish samples were reviewed. Of the seven, four documents showed different dates when the environmental personnel sent the samples to the lab and the lab received the samples. Environmental personnel indicated that the fish samples are gathered, placed in a refrigerator, an unsecured container, for future analysis.**

The Environmental Protection Agency's "Environmental Investigations Standard Operating Procedures and Quality Assurance Manual" dated May 1996 section 5.13.4 indicates that the chain-of-custody exists to ensure that samples taken in the field will withstand scrutiny during litigation. Section 3.3.2 titled "Sample Custody" provides examples of what custody would consist of to ensure an unbroken chain of custody. The above EPA document indicates that samples taken in the field which do not possess an unbroken chain-of-custody are subject to legal questioning because of the possibility of, deliberate or accidental, tampering with the samples or contamination of the samples.

NRC believes that the licensee should review this program to ensure that the licensee's chain-of-custody procedures are within industry standards.

(6) **The inspector noted that the number of environmental soil samples taken in 1998 as documented in the "BCLDP Site Environmental Report for Calendar Year 1998 on Radiological and Non-radiological Parameters" report were changed in 1999 from 24 to 8 samples.**

On September 25, 2000, the licensee provided the NRC documentation concerning the decrease in the number of environmental samples taken by the licensee. The NRC will continue to review this issue during a future inspection.

I. RECORD KEEPING FOR DECOMMISSIONING

1. Copies of the licensee's decommissioning cost estimates and funding methods are on file. () Y ( ) N
   This area not reviewed during this inspection.

2. Licensee has adequate records for decommissioning activities performed (e.g., for decontamination and dismantlement of structures; decontamination and remediation of soil, sediment, surface waters,

groundwater; surveys of remediated facilities). (X) Y ( ) N

3. Licensee's financial assurance conforms with the financial assurance requirements of NRC-approved possession limits and NRC regulations. ( ) Y ( ) N
This area not reviewed during this inspection.

Basis for Findings: The inspectors identified several concerns regarding the licensee's environmental monitoring program. See section H for details.

J. TRANSPORTATION

1. Describe the licensee's program to package and ship decommissioning waste materials:
This area not reviewed during this inspection.

2. Licensee's program meets all applicable 10 CFR and 49 CFR requirements for marking labeling, placarding, and shipping paper requirements for radioactive waste shipments. ( ) Y ( ) N
This area not reviewed during this inspection.

Basis for Findings: The licensee's computer modeling program for converting external radiation measurement into activity measurement, such that the radiological activity can be determined for shipping records was reviewed. The modeling program methodology was determined to be adequate. Records of a waste site had also reviewed and the modeling program concerning this site was discussed with the licensee.

K. POSTING AND LABELING

1. All contaminated areas, waste processing areas, and waste handling areas are posted in conformance with regulations. (X) Y ( ) N

2. Packaged radioactive waste materials are labeled in accordance with regulations. (X) Y ( ) N

Basis for Findings: Inspector observations

L. OCCUPATIONAL HEALTH AND SAFETY

1. Describe the occupational health and safety observations made at the licensee's facilities: Safety shoes, glasses and helmets required.

2. Licensee and Occupational Safety and Health Administration were informed of occupational health and safety issues observed during the inspection. () Y (X) N

Basis for Findings: Inspector observations. All personnel working in these areas were provided with appropriate equipment.

4. VIOLATIONS, NON-CITED VIOLATIONS, FOLLOW UP ITEMS, AND OTHER ISSUES

Briefly state (1) the requirements and (2) how and when the licensee violated the requirement. For non-cited violations, indicate why the violation was not cited. Briefly describe follow up items and other issues.

A. A violation of minor significance was identified regarding failure to perform all required maintenance on the radioactive waste compactor. See section B for details.

B. During the inspection the inspectors determined that the rear door to the HLC was lowered vertically into the floor on a floating hydraulic system. It was determined that if the hydraulic system were to fail, the door would"fail open." The licensee's FROM indicated that they were aware of this issue and made contingencies for this potential failure. However, there did not appear to be any written document addressing the issue or the contingencies to be taken in the event of such a failure. This issue will be reviewed during the next inspection. The FORM was aware of the maximum gamma field expected if the door were to fail open and what actions would be necessary to insure compliance with the regulations.

C. A follow-up item was identified regarding the locations of environmental air monitoring stations. See section H for details.

D. A follow-up item was identified regarding the placement of environmental air monitoring filter collection points. See section H for details.

E. A follow-up item was identified regarding the number of water and sediment samples taken at Darby Creek. See section H for details.

F. A follow-up item was identified regarding the locations of water and sediment samples taken at Darby Creek. See section H for details.

G. A follow-up item was identified regarding the implementation of the licensee's chain-of-custody for certain environmental samples. See section H for details.

H. A follow-up item was identified regarding the number of off-site soil samples taken by the licensee. See section H for details.

NRC
REGION III
EMERGENCY PREPAREDNESS CHECKLIST

LICENSEE:	Battelle Columbus Laboratories Decommissioning Project
LICENSE NO.	SNM-00007
DOCKET NO:	070-00008
DATE OF INSPECTION:	August 28-September 1, 2000
INSPECTOR:	George M. McCann
APPROVED BY:	Bruce L. Jorgensen, Chief NRC Region III Decommissioning Branch

LICENSEE PERSONNEL INTERVIEWED: 1. Gene R. Roe, Emergency Management Coordinator, Battelle Memorial Institute 614 424-4344

2. Regina F. Kight, Emergency Management Specialist, Battelle Memorial Institute 614 424-5061

1. 03.01 **Program Changes**

A. Changes that should be considered include

OK (1) organizational structure,
Ok (2) responsibilities, authorities,
Ok (3) staffing levels, and
Ok (4) key emergency personnel.

B. Other items that could impact the emergency plan include

Ok (1) significant plant changes or modifications (such as the addition of a new process or technology,
Ok (2) the addition of new hazardous materials, or changes in inventories of existing hazardous materials)
Ok (3) changes to the agreements with the offsite support agencies.

NOTE: Inspectors also reviewed "*BCLDP EMERGENCY MANAGEMENT PLAN*, DD-93-07, Revision 4. The current Revision 3, was issued December 18, 1997. The draft Version 4 reviewed by the inspectors appeared well written and workable The licensee committed to providing an uncontrolled copy of the revised Plan to NRC Region RIII.

The two emergency preparedness professionals interviewed during this inspection appeared very knowledgeable and committed to insure the licensee's Fire Protection and Emergency Preparedness Program were of high quality, and ready to address whatever issues should be faced during emergency situations.

Confirm

management controls to ensure that the emergency plan is maintained up to date and offsite support agencies are kept current with program revisions. Those controls should also establish guidance for identifying when prior NRC approval is required for proposed changes to the program.

2. 03.02 **Implementing Procedures**

Ok A. implementing procedures should be reviewed in detail After that, only procedure revisions need be reviewed,

OK B. Interview emergency staff, to determine whether they are familiar with the procedures and the procedures are user-friendly. Interview:
Ok (1) shift supervisor,
Ok (2) shift fire fighter,
Ok (3) another emergency responder

Ok C. The inspector should also verify that the licensee has established provisions for ensuring that the emergency procedures are kept up to date at all remote locations.

NOTE: See referenced Emergency Plan reviewed during this inspection. Also, copies of Fire Pre-Plan, and associated documents were identified at the Jefferson Township Fire Department, and the Licensee's Emergency Operation Center located in JN-6.

3. 03.03 **Training and Staffing**

Ok A. walk through with a shift supervisor and other appropriate individuals to discuss:
Ok (1) emergency training received.
Ok (2) notification, call out and evacuation procedures
Ok (3) training
Ok (4) where to find the appropriate procedures and equipment.

B. review the training provided to offsite responders. Discuss:
Ok (1) method to ensure that the training frequency is maintained
Ok (2) training content is revised to reflect changes to the plant and onsite hazards. , e.g.:
OK • new processes,
Ok • buildings, and hazardous chemicals, including their location and inventory.
NA • problems, such as water exclusion areas for criticality control, should be clearly identified in the prefire plan

4. 03.04 **offsite Support Agencies**

OK A. Contact with selected agencies

OK B. required to comply with the EPA SARA (Superfund Amendment and Special Preauthorization Act) Title III regulation ("Emergency Planning and Community Right-To-Know Act")? If so:

Ok (1) emergency response planning,
Ok (2) emergency response reporting,
Ok (3) hazardous chemical inventory reporting, and
Ok (4) toxic chemical release reporting.

Review the "Hazardous Chemicals" section of the emergency response plan to determine what requirements apply to the licensee and determine how the licensee certifies compliance with the Act. Verify that the licensee reviews major facility and process changes (i.e., addition of new processes or significant changes in process technology and chemistry) to ensure that it remains in compliance with the Act.

5. 03.05 **Drills and Exercises**

NOTE: The licensee holds annual drills. The 1998 and 1999 drill reports were reviewed. Excellent and professional written reports. The licensee has another exercise schedule for September 2000. There has been excellent participation by local organizations. Such as the Madison County Sheriff Department, West Jefferson Police Department, Ohio Highway Patrol, Jefferson Township fire Department, Prairie Township Fire Department, Doctor's West Hospital, University of Ohio Hospitals, and local Emergency Services Agencies.

Although resource limitations may prohibit the observation of each biennial drill, not more than one should be skipped. If there were significant problems with the previous drill, then the next scheduled drill should be observed.

6. 03.06 **Emergency Equipment and Facilities**

OK A. Random selection of equipment or evacuation points . Findings:

Emergency equipment maintained, and periodic checked for equipment maintenance. Records reviewed during this inspection. SCUBA gear located at ingress and egress points to JN-1.

NR B. Only one offsite sampling area and one criticality badge station need be observed. Findings:

Inspectors visited the following off site agencies:
Madison County Sheriff Department, London, Ohio
Jefferson Township Fire Department, West Jefferson, Ohio
Doctor's West Hospital, Columbus, Ohio

Discussion with the Madison County Sheriff indicated that a good working agreement and cooperation had been established between the licensee and the Sheriff Department.

Discussions with the Jefferson Township Fire Department indicated a close cooperation and working agreement between the Fire Department and the licensee. Additionally, the licensee's Pre-Plan and other documents were available at the Fire Department, and are available for emergency responses. The Fire Chief commented on the licensee's cooperation, and the quality of the annual drills which his Department participates.

Discussion with the Doctor's West Hospital coordinator found a well equipped and prepared organization. The Hospital maintains a dedicated area for dealing with patients contaminated with hazardous materials, e.g., chemical, biological or radiological materials. Dedicated equipment is maintained. Review of the Hospital emergency drills were discussed and reviewed during this visit. Some details of the cooperation between the Special Project Officer were limited since he had just taken over the responsibility. The licensee's representative invited the Project Officer to tour the facility as soon as arrangements could be made.

The Inspectors also reviewed Mutual Agreement documents between Battelle and the various emergency and police agencies.

NRC REGION III
FIRE PROTECTION CHECKLIST

LICENSEE: Battelle Columbus Decommissioning Project
LICENSE NO. SNM-00007
DOCKET NO: 070-00008
DATE OF INSPECTION: August 28-September 1, 2000
INSPECTOR: George M. McCann
APPROVED BY: Bruce L. Jorgensen, Chief
NRC, Region III, Decommissioning Branch

LICENSEE PERSONNEL INTERVIEWED: 1. Doug Winemiller, Safety Officer
Battelle Memorial Institute
614 424-4967

2. Gene R. Roe, Emergency Management Coordinator, Battelle Memorial Institute
614 424-4344

3. Regina F. Kight, Emergency Management Specialist, Battelle Memorial Institute
614 424-5061

NR= not reviewed, NA=not applicable

a. Inspection Requirement 02.01.
The Fire **Protection Program should be described in a document** available for inspection and should, as a minimum, consist of the following elements:

OK 1. Identification of the management person who is given the authority and staff assistance to implement the program. This person does not need to be a fire protection specialist.

OK 2. Identification of a supervisory person responsible for day-to-day implementation of the program. This person should meet appropriate qualification standards and have practical experience in fire protection.

NA 3. Composition, functions, and responsibilities of a Fire Safety Review Committee.

Not a requirement for this licensee

MA 4. Performance of an annual fire hazard analysis.

NA 5. A system of planning and follow up for correction of deficiencies identified by the fire hazard analysis, periodic audit, or inspection report.

OK 6. Fire protection equipment maintenance and testing program.

OK 7. System of controlling welding and other hot working. Typically, permits are issued and a fire watch is maintained during such work.

NOTE: Licensee's Hot's Permit discussed and reviewed.

OK 8. Fire brigade training. Details, such as training subjects, frequency of instructional meetings and drills, tests administered, and files on individual brigade members indicating course completion should be maintained.

NOTE: This licensee is not required by license commitment to maintain a Fire Brigade. However, it was noted that the licensee maintains a "First Responder" group of staff and managers who have been given basic training in the use of fire extinguishers, and what to do in the event of a fire. The licensee provides annual fire training HS-140, and HS-141. The licensee also uses a private contractor to service its fire extinguishers, and provide training on their use to the First Responders.

Licensee's training record reviewed. Approximately 125 persons participated in the above training. Majority of the training was provided to staff during the month of October 1999.

b. Inspection Requirement 02.02. As a minimum, the following documents should be reviewed, and it should be determined, on the basis of the review, whether the program is being properly implemented:

OK 1. The two latest fire insurers' audit reports: determine action taken on reported deficiencies.

NOTE: Loss Prevention reports reviewed for November 3, 1999, and February 15, 2000 by the BCLDP insurer were reviewed. The reports covered both the North, Middle and South Sites. Electrical, fire, lightening, and construction related issues were reviewed. No significant issues were noted as deficiencies. The insurer credited the BCLDP Program for its commitment to maintain safety risks as low as possible.

NA 2. Fire Safety Review Committee meeting minutes: determine frequency f meetings, deficiencies reported, and action taken thereon.

OK 3. Fire protection equipment maintenance records: determine whether the frequency of inspection and maintenance conforms with industry codes.

OK 4. Welding and other hot working permits.

NA 5. Fire brigade training schedules and individual training records: note the instructional subjects, instruction providers, frequency of refresher training, and critiques of drills.

NOTE: The "First Responders" (two types of First Responders, one type is composed of health physics qualified personnel, and the other consist of hazardous material trained personnel), receive annual training in use of fire extinguisher, and basic emergency rescue and first aid annually.

A First Responder duty roster is posted in work areas, and at the Security Control Point. The roster is updated weekly.

OK 6. Pre-Fire Plan: this is discussed below, under the specific guidance on Inspection Requirement 02.07, p. 12.

NOTE: The Health Physicist and Hazardous Material "First Responders", although not classified or trained as fire brigade personnel, have been given training in the use of fire extinguishers, and actions to take in the event of a fire.

c. **Inspection Requirement 02.03**

NA 1. **Building Construction**

(a) The process buildings should be designed and constructed to qualify as Type I construction, as classified by NFPA 220, Types of Building Construction. This requires that the structural members of the buildings, including walls, columns, beams, floors, and roofs, are constructed of approved noncombustible or limited combustible materials and have specified minimum fire resistance ratings. If non-process areas are housed in the same or adjoining buildings, the entire building complex should be of Type I construction.

NOTE: These Buildings are of metal and concrete construction. Areas observed by the inspectors were separated by metal doors. The construction of these buildings are not considered an issue at present since the buildings are no longer being used for processing of materials. The buildings are being decommissioned and will ultimately be torn down. Thus the radiological source term is diminishing rather than increasing.

NA (b) To confine fire to its area of origin and prevent its spread, areas containing processes or materials involving fire hazards should be separated by structural barriers into fire areas. In particular, solvent extraction process areas, boiler rooms, incinerators, warehouses, control rooms, switchgear rooms, computer rooms, maintenance shops, fire pump areas, and office areas should be separate fire areas. Structural

barriers, including walls, floors, ceilings, and roofs, that bound fire areas, should have a minimum of 1-hour fire resistance rating.

NOTE: Licensee staff indicated that the above is not an issue since the buildings are in a demolition phase, and that a significant attempt to save the buildings would not be considered if a major fire was to occur. However, the building work areas are distinct from each other, separate by metal doors. Also, the building is primarily concrete, brick, and metal construction. It was noted during the review of the licensee's insurer reports, that electrical, fire protection and other building safety related issues are evaluated annually, and that no significant issues were identified by the insurer.

OK (c) Openings in the barriers comprising boundaries of fire areas should have NAdoors or fire stops installed. Such devices should have at least the same fire resistance rating as the barriers they are installed in.

NOTE Inspectors observed during their walk around tour of the facilities that metal. doors separated various work areas inside the JN-1 Facility.

NR (d) When a process building is near installations, such as flammable liquid or gas storage, the risk of exposure fires (originating in such installations) to the process building should be evaluated and appropriate protective measures taken. NFPA 80A, Protection of Buildings from Exterior Fire Exposures, provides guidance on such exposure protection. NFPA 30, Flammable and Combustible Liquids Code, provides minimum separation distances from tank storage.

NOTE Inspectors tour of the building and outdoor areas did not identify any external fire hazards.

OK (e) The building design should provide for safe means of egress for personnel in the event of a fire emergency. Egress routes should be clearly marked. NFPA 101, Life Safety Code, provides guidance on egress design and the requirements for protection of egress routes.

NOTE: Licensee's emergency Plan addresses evacuation, emergency access to site by emergency personnel, and assembly areas, and designation of persons responsible for verifying personnel during an emergency.

OK (f) Provision should be made for protection of the facility from lightning damage. The installation of such protection should comply with NFPA 78, Lightning Protection Code.

OK (g) All electrical wiring and installations should be made, used, and maintained in accordance with NFPA 70, National Electrical Code, and other standards that apply to special situations, such as NFPA 70B, Electrical Equipment Maintenance, NFPA 70E, Electrical Safety

Requirements for Employee Workplaces, NFPA 79, Industrial Machinery, and NFPA 75, Electronic Computer/Data Processing Equipment.

NOTE: Inspector was informed that JN-1 has mechanisms in place to deal with lightening strikes. It was noted that lightening protection and evaluation was an area evaluated by the licensee's insurer..

2. **Ventilation System**

OK (a) The ventilation system should be designed to isolate affected areas during fire accidents and to provide channels for exhausting fire products, through filters if necessary, to outside the plant. NFPA 90A, Air Conditioning and Ventilating Systems, may be consulted on ventilation design for fire protection.

OK (b) Where a ventilation system is required to prevent the release of radioactive material to the atmosphere, all materials of construction and all filters for the system should be fire resistant. High efficiency particulate air (HEPA) filters should conform with Underwriters' Laboratories Standard UL-586, also designated ANSI B 132.1, High Efficiency Air Filtration Units.

NOTE: The HEPA filters used in the JN-1 facility are nuclear grade filters. A heat sensor system in the High Energy Cell, which if activated automatically closes dampers on the roof of the JN-1 building. The JN-1 Facility is designed, such that should the smoke detectors detect smoke from a fire, that the hot cell ventilation systems are shut down.. The JN-1 building is not equipped with smoke removal devices. Licensee would use 4 foot fans or rely on fire department to handle smoke removal. The RSO informed the inspectors that the HEPA filters are made by American Air Filter, (or equivalent vendors) their Astrocell One, which is 99.99% efficient, the media is water fire retardant, radiation resistant fiberglass and the cells side walls are stainless steel, There are two BCLDP operators who have been trained by the manipulator manufacturer Central Research, out of Wisconsin.

NA (c) If a heat removal system such as a water spray system is required for the final filter plenum, it should operate automatically (with manual override) upon abnormal rise of the effluent temperature.

NA (d) Heating furnaces should be installed in accordance with NFPA 54 (ANSI Z223), National Fuel Gas Code, if gas-fired, or NFPA 31, Oil Burning Equipment, if oil-fired. The installation of electrical duct heaters should comply with NFPA 70 National Electrical Code.

NOTE: Inspectors reviewed the annual boiler and machinery inspection report for the boilers located at West Jefferson.

d. **Inspection Requirement 02.04**

NA 1. **Processes Involving Flammable and Combustible Liquids and Gases**

NA (a) Processes involving solvents or other chemical substances that may be classified as flammable liquids or as combustible liquids, Class II, according to NFPA 321, Basic Classification of Flammable and Combustible Liquids, should be isolated from each other and from the remainder of the facility by locating them either in separate buildings or in spaces enclosed by barriers having a minimum fire resistance rating of 1 hour.

NOTE Licensee's Pre-Fire Plan describes West Jefferson Buildings construction, and materials inside these buildings which could be expected to be encountered by Firemen responding to a fire.

NA (b) All electric motors, switchgear, lighting, and other electrical installations in these areas should be of the explosion-proof type and installed in accordance with NFPA 70, National Electrical Code.

NA (c) No open flame should be permitted in these areas, except for construction or maintenance work with the process shut down.

NA (d) The areas should be provided with automatic fire detection and automatic explosion prevention/suppression systems. NFPA 69, Explosion Prevention Systems, provides guidance on design, selection, and installation of such systems.

NA (e) Where a process involving a flammable or combustible liquid or gas is in the same fire area as an ignition source, such as an open flame, one or more analyzers should be installed strategically to monitor the flammable or combustible vapor or gas concentration in the air. The analyzers should activate both visible and audible alarms whenever the vapor concentration exceeds a set limit -- for example, 10 percent of the lower flammable limit. Simultaneously, ignition sources and flammable gas supplies in the area should be turned off automatically.

2. **Machining Operations of Combustible Metals**

NA (a) Metals such as uranium and zirconium, and their alloys, are known to be combustible, especially when in a finely divided form. Machining operations in the facility should, therefore, be evaluated for the potential for combustible dust cloud formation and combustible scrap and swarf accumulation from operations, such as sawing, grinding, machining, and abrasive cutting. Fire protection measures for these metals are similar. NFPA 482, Production, Processing, Handling and Storage of Zirconium, provides guidance.

NOTE: The licensee does not machine the above material.

NA (b) No open flames should be permitted in the areas where machining operations of combustible metals are performed. If maintenance operations, such as welding, are to be performed in the vicinity, machining operations should be halted, and metal scraps should be removed.

NA (c) Machining operations on combustible metals should be performed in enclosures with a dust-collection system in operation. The collected dust should be ducked to a dust collector and also a HEPA filter, if required, for removal of radioactive particles. The collection hood and duct leading to the filter should be designed to minimize deposition of the fines and to facilitate cleaning.

NA (d) Scrap and swarf generated by machining operations and accumulated in the immediate area should be swept as frequently as necessary and collected under water in covered metal containers. Such collections should be removed daily from the process areas. Dust and sludge collected in the dust separators and ducts should be removed as often as necessary.

NA (e) Extinguishing agents suitable for the particular metal fire, as well as suitable scoops or applicators, should be readily available to the operator performing the machining.

3. **Incinerators**

NA (a) Incinerators should be separated from the remainder of the facility by fire barriers having a minimum 1-hour fire resistance rating.

NOTE: There are no incinerators located at the West Jefferson Site.

NA (b) Where the incinerator is required to burn radioactive contaminated waste, its exhaust should be ducked to a filtration system before release to the environment. The exhaust may also be ducked to the facility off-gas system. Such ducts should be designed to minimize deposition of particulate effluent and to facilitate cleaning.

NA (c) Depending on the temperature of the exhaust, a cooling water spray or passage through a liquid precipitation separator may be required for both cooling and dust separation.

4. **Boilers and Boiler Furnaces**

OK (a) Boilers for the supply of steam for process operation and boiler furnaces should be separated from the remainder of the facility by fire barriers

having a minimum 1-hour fire resistance rating.

OK (b) The construction and operation of the boiler furnaces should comply with the relevant standards in the NFPA 85 series, depending on the type of furnace and the fuel used.

NR (c) The fuel storage tanks should be separated from the furnace area by fire barriers having a minimum 1-hour fire resistance rating. The fuel lines should be laid out to minimize possibility of damage.

5. **Stationary Combustion Engines**

OK (a) Stationary combustion engines, if located in part of a structure housing fuel processes, should be in enclosures having a fire resistance rating of at least 1 hour.

Note: Licensee's backup emergency generator is not located inside the building.

NA (b) Fuel storage tanks, except for day tanks, should be located outside the room and be constructed in accordance with NFPA 30, Flammable and Combustible Liquids Code. Unenclosed day tanks should be constructed and have capacities limited according to NFPA 37, Stationary Combustion Engines and Gas Turbines.

NOTE: The diesel fuel tanks are at a remote location away from the JN-1 building, near the rear gate to the North Site.

OK (c) The engine exhaust system should be designed to prevent ignition of any combustible material by contact with hot metal surfaces or by leaking exhaust gases or sparks.

NA (d) The stationary combustion engine room should be ventilated effectively to minimize accumulation of combustible vapor and possibility of explosion. NFPA 37 provides guidance.

6. **Storage and Handling of Flammable and Combustible Liquids and Gases**

NA (a) The construction, installation, operation, and maintenance of combustible liquid storage and the related loading and dispensing systems should comply with NFPA 30, Flammable and Combustible Liquids Code.

OK (b) Indoor storage of flammable and combustible liquids may be permitted in limited quantities in approved closed containers for the purpose of day-use (such as for diesel engine operation) and maintenance work. Appropriate portable fire extinguishers should be available.

NOTE: Licensee's insurer's report indicated that such storage was limited and acceptable.

NA (c) Steel supports of above-ground storage tanks should be protected from exposure fires, whenever dictated by proximity of other flammable or combustible storage tanks, located in a common diked area, or by proximity of a tank-truck loading/unloading area.

NA (d) The construction, installation, operation, and maintenance of bulk gas (including liquified gas) storage and the related loading and dispensing systems should comply with good industry practice and the relevant NFPA Standards, as applicable, e.g., NFPA 50, Bulk Oxygen Systems at Consumer Sites, NFPA 50B, Liquified Hydrogen Systems at Consumer sites, and NFPA 54, National Fuel Gas Code.

7. **Hot Cells**

OK (a) The construction materials for hot cells should be noncombustible. The internal surface coatings should be noncombustible or limited combustible.

NOTE: Reviewed the Material Safety Data Sheet dated July 23, 1999, by Hot Cell Services Corporation, 22626 85th Place South, Kent Washington. The record discussed the material used to fill the Hot Cell Windows. The RFOM indicated that he did not believe the windows required grounding due to the low source term. The window was filled with white mineral oil, which was selected for its clarity, low flammable and stable nature as far as chemical reactivity.

OK (b) The liquid-filled windows should contain a noncombustible medium. Hydraulic fluids in the master-slave manipulators should be of the nonflammable type.

NOTE: Inspector review of the MSDS for the windows and hydraulic fluids used in the manipulator and cell door were reviewed.

OK (c) Where process materials and equipment present fire hazard, the quantities of combustible materials and the sources of ignition should be maintained at the absolute minimum. If flammable gases or vapors may be present in explosive proportions, an inert atmosphere should be provided when operating the hot cell.

OK (d) Where combustible materials are used in a hot cell, extinguishing agents, compatible with the materials handled, and their delivery systems should

be provided within the hot cell. Nuclear criticality concerns should be considered in selecting extinguishing media.

OK (e) Filters for the exhaust air from a hot cell should be of noncombustible construction

NOTE: Nuclear Grade HEPA filters used. System is designed such that if a high temperature is detected in the cell that dampers on the roof are automatically shut. Additionally, if smoke detectors are set off by smoke, the ventilation systems are also shut down.

NR (f) Further guidance for hot cell fire protection is provided in NFPA 801, Facilities Handling Radioactive Materials.

8. **Glove Boxes**

NR (a) The construction materials for glove boxes may be of the limited combustible type if only noncombustible process materials are used within them. Otherwise, the glove box, except for the gloves, should be of noncombustible construction.

NOTE: There are no glove boxes in use at this facility.

NR (b) If combustible materials are used, or if there is the possibility of an explosive mixture forming within the glove box, the relevant guidance provided for hot cells should also apply.

NR (c) If a number of glove boxes are operated in series, fire dampers should be provided at intervals to impede propagation of fire.

NA 9. **Laboratories.**

The fire protection methods of laboratories handling radioactive materials are similar to those of chemical laboratories. Guidance is provided in NFPA 45, Laboratories Using Chemicals.

NOTE: There is only one laboratory at the West Jefferson North Site which would fit the above description. This laboratory is the BCLDP Radio analytical laboratory. The laboratory was not inspected as part of this inspection.

e **Inspection Requirement 02.05**

1. **Fire Detection and Alarm Systems**

OK (a) Automatic fire detectors of appropriate types should be installed in all areas having substantial combustibles, that are infrequently visited or are occupied only part of the 24-hour day.

NA (b) Automatic combustible vapor and gas detectors should be installed in areas where there is a potential for leakage of flammable or combustible liquids or gases.

OK (c) Automatic fire detectors and combustible vapor/gas detectors should actuate audible and visible alarms in the area of origin of the alarm, as well as at a central constantly supervised monitoring station. Such monitoring stations should constantly have available information on the status and functioning of the fire and combustible vapor/gas detection systems and of the installed fire suppression systems, including a zone indication of the origin of an alarm. These systems should comply with the requirements of NFPA 72D, Proprietary Protective Signaling Systems, and NFPA 72E, Automatic Fire Detectors.

NOTE: Alarm panels are located at the entry way to JN-1, and at the Security Check Point located at the West Jefferson South Site. In addition to automatic and pull alarms the buildings are checked periodically throughout the day and night by Security Police. Additionally, JN-1 has video cameras which are strategically located throughout the building which allows personnel to see the condition of the facility on monitors located at the entrance to the building. This facility is not required by license provision to comply with the above cited standards.

OK (d) Manual fire alarm actuators (pull-boxes) or telephones should be available at strategic locations, e.g., near area exits.

OK (e) Actuation of any fire suppression system, such as flow through a sprinkler system, should actuate visible and audible alarms.

NOTE: The ventilation system to the hot cells are shut down if the CAMs detect material which indicate a break down of the HEPA filters thus indicating a potential release to the atmosphere. If the a preset value is exceeded then there are audible and visual alarms set off both inside and outside the building. Additionally if the smoke detectors detect smoke the ventilation systems are also shut down. There is also a high temperature detector in the High Energy Cell (HEC) which will automatically close dampers on the roof if tripped.

2. **Fire Suppression Equipment**

NR (a) Automatic water sprinkler coverage is the preferred method of fire suppression for most areas having significant fire hazard. The notable exceptions are areas where moderation control to prevent accidental nuclear criticality is necessary and areas with concentrations of energized electrical equipment, including computer installations and control rooms. NFPA 13, Sprinkler Systems, provides guidance for selection and design of sprinkler systems.

NOTE: JN-1 does not have a in-house fire suppression system other than extinguishers.

OK (b) Plant areas having significant fire hazards, an d where water is unsuitable as a suppression agent, should be protected by other systems employing fire suppression agents such as inert gases, carbon dioxide, halon (where already installed), and high- or low-expansion foam, as appropriate. Guidance on carbon dioxide and halon systems is provided in NFPA 12 and NFPA 12A, respectively. Guidance on the selection and design of foam systems is provided in NFPA 11 and NFPA 11A. Selection of gaseous suppression systems should take into account protection of personnel and possible pressurization of the enclosure protected.

OK (c) Coverage by standpipe and hose systems should be provided for the protection of all process and non-process areas. The hose outlet locations should be readily accessible. Guidance on standpipe and hose systems is provided in NFPA 14.

NOTE: The building does not have the above systems, however, the West Jefferson Site has a tower and water system supplied to the area for use in the event of a fire. Responding units would be able to use this water supply.

OK (d) Portable fire extinguishers, suitable in capacity and in the type of suppression agent used, should be available throughout the facility, irrespective of availability of any other fire suppression system. The number and capacity of such extinguishers and their deployment should be guided by NFPA 10, Portable Fire Extinguishers.

NOTE Inspectors reviewed the monthly checklist for fire extinguishers, and other fire suppression systems.

3. **Fire Protection Water System**

OK (a) Adequate supply of water for the installed fire protection systems should be ensured. Additional supply of fire fighting water that may be needed by an outside fire department should be planned for in consultation with them. Compatible connections should be provided for outside fire department use. The fire water-distribution system should be designed and constructed for high reliability. NFPA 24, Private Fire Service Mains and Their Appurtenances, should be used for guidance.

NOTE: Annual drills and visits by the local fire departments are routinely conducted. During a visit to the Jefferson Township Fire Department (primary responder), inspectors determined that a copy of the licensee's Pre-Fire Plan was possessed by the Fire Department, and that the Fire Chief and his Assistant Chief were well aware of the issues which would have to be addressed in responding to

a fire at the BCLDP Site.

OK (b) The fire pump installation should be adequate to deliver water at full pressure at the farthest hydrant, standpipe, and hose station or sprinkler system. The installation should comply with the requirements of NFPA 20, Centrifugal Fire Pumps.

NA (c) Provisions should be made for alternate sources of power for fire pumps, so that failure of one source will not disable the installation. A diesel engine-driven pump is typically used as an alternative to an electrically driven one.

NA (d) The fire protection water-distribution system should be designed so that the failure of a single component, e.g., a pump, valve, etc., does not prevent the ability to deliver fire fighting water to any part of the facility.

f. **Inspection Requirement 02.06**

NA 1 .A systematic fire hazard analysis should divide the facility into "fire areas" and evaluate te the fire safety of each area and of the facility as a whole. The analysis for each fire area should:

(a) account for all radioactive and combustible materials, including estimates of their heat content;

(b) describe the processes performed and their potential for fire or explosion;

(c) account for the sources of heat and flame;

(d) list all fire detection and suppression equipment; and

(e) consider credible fire scenarios and evaluate the adequacy of the fire protection measures.

NA 2. Any significant modification of buildings, processes, or inventories should necessitate a new fire hazard analysis.

NA 3. Biennial fire hazard analyses may or may not have been required by license condition. In that case, the inspector should review audit reports of the facility's Safety Review Committee; these reports should include fire safety audits. Fire insurance companies also perform annual audits. The inspector should determine, by inspection of documents and by physical inspection of the facility, whether deficiencies reported in the audits and in the fire hazard analyses have been corrected.

NOTE: Neither fire analysis or Committee are required by license. Annual reviews by the license's insurer are done . Additionally, both the licensee's Pre-Fire Plan address fire issues and emergency planning for such an eventually.

g. **Inspection Requirement 02.07.**

OK A **Pre-Fire Plan** should assign individual and alternate responsibilities for suppressing incipient fires; calling for the site fire brigade and, if necessary, offsite fire department assistance; personnel evacuation; orderly shutdown of processes; and safeguarding and control of radioactive material. The plan should clearly indicate, preferably with the help of site plans and drawings, the location of fire fighting equipment such as portable extinguishers, automatic fire suppression systems, block valves, stand-pipes, hydrants, and hoses. It should indicate the areas of concentration of combustibles, storage of flammable or combustible liquids, and areas where use of water for fire suppression is restricted.

OK Fire emergency planning is sometimes encompassed in the general radiological emergency planning required by license condition. However, a Pre-Fire Plan is different from a Radiological Contingency Plan in that it requires information needed by fire-fighting personnel responding to an emergency. Often, the same team of employees is trained to respond to both fire and radiological emergencies. This is acceptable, since a fire emergency may turn out to be a radiological emergency, as well.

h. **Inspection Requirement 02.08**

NR 1. The **organization, training, and equipment of the fire brigade** should be adequate to respond to any credible fire emergency, with assistance from offsite fire departments, where such assistance is available. NFPA 600, Private Fire Brigades, should be used for guidance.

NOTE: Addressed above. Fire brigade not required.

NR 2. All members of the brigade should receive adequate training. NFPA 600 provides guidance on the subjects of training and the frequency of refresher sessions and drills. The inspector should look for documentation of the meetings held, subjects taught, examinations given, and names of the attendees and the instructors. Documentation should also include training files for each fire brigade members.

Ok 3. The inspector should obtain documentation showing that fire drills have been held at least annually, that the drills have been duly critiqued, and repeated if serious deficiencies were found. Joint drills with offsite fire departments should be held at least biennially.

OK 4. The offsite fire department most likely to respond to calls for assistance should be reasonably familiar with the facility. Members of the department should be given annual familiarization tours of the facility.

Attendance Record

Subject: NRC Inspection Close-out Meeting
Date: August 31, 2000
Time: 11:30 a.m. – 12:30 p.m.

Name (print)	Signature	Company	Telephone Number
J. HALLGREN		BMI	424-7961
J. Schwiecker		BCLDP	424-3314
Regina Kight		BCLDP	424-5061
Tracy D. Chance		BCLDP	424-7876
GENE ROE		BCLDP	424-4344
Gretchen Fanning		BCLDP	421-7045
Frank Hood		BMI	424-4181
Joseph CROMBIE		ODH	728-5734
J. ERIC DENISON		ODH-BRP	995-0761
Michael M. LaFranzo		USNRC	630-829-9865
Joe Gaunter		BCLDP	614 424-4961
Jan Gauthier		BCLDP	614-424-5353
April Chance		BCLDP	614.424-3883
Craig Jensen		BMI/BCLDP	614-424-5170
Larry Sanders		BMI/BCLDP	614 424-4857
George M McCown		NRC RIII	630 829 9856

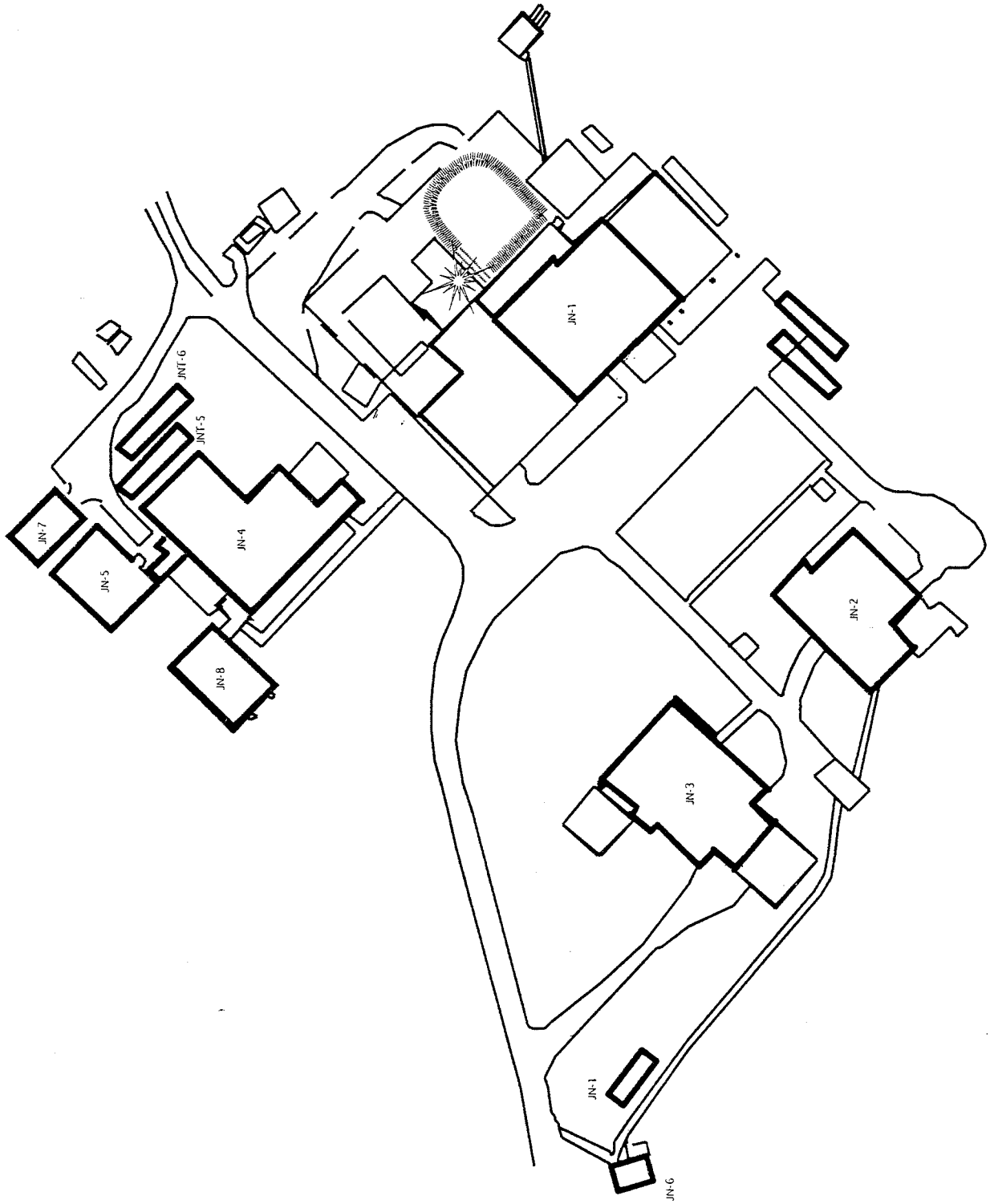
Attendance Record

Subject: NRC Inspection Kick-off Meeting
Date: August 28, 2000
Time: 1:00 p.m. – 2:00 p.m.

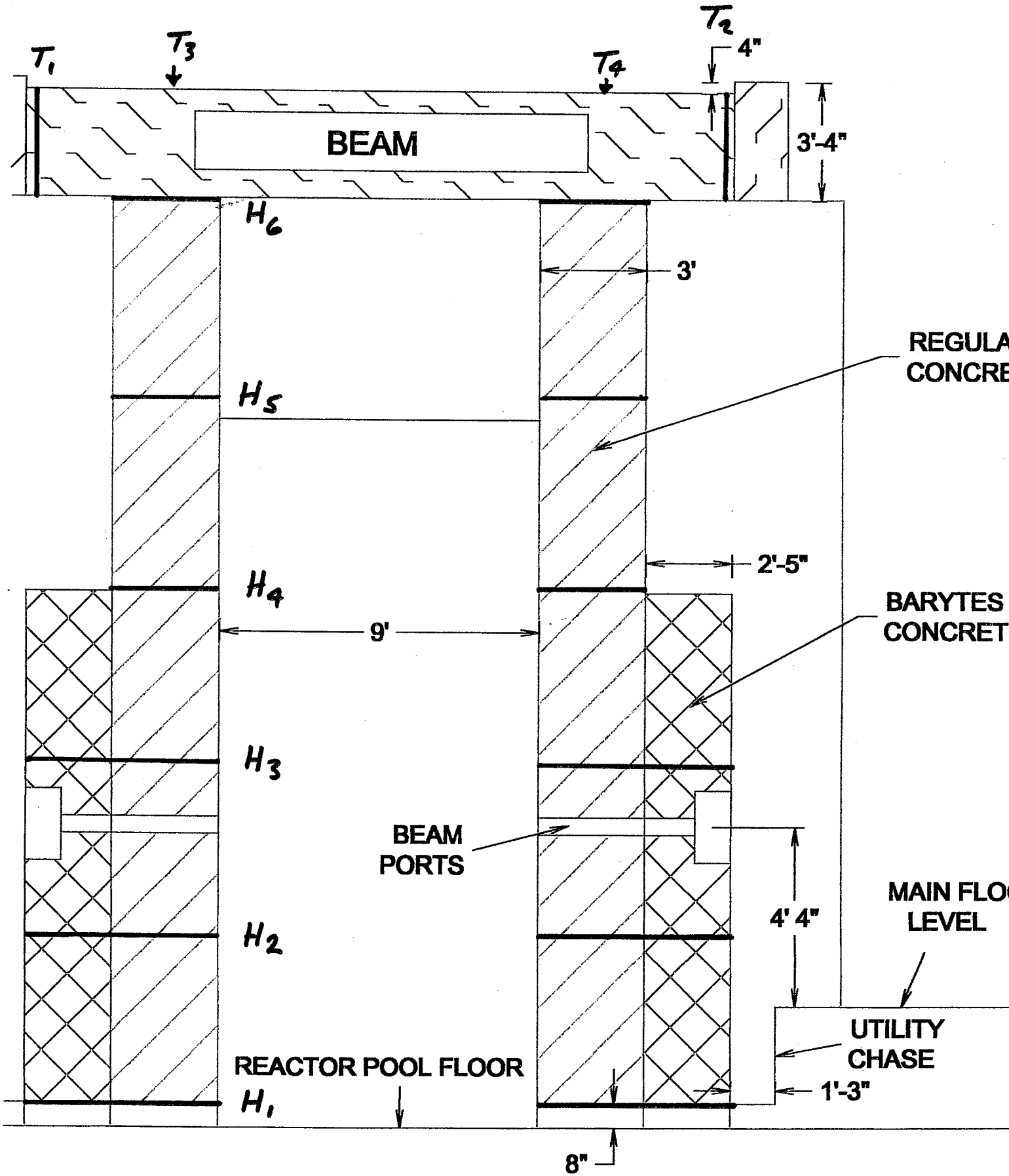
Name (print)	Signature	Company	Telephone Number
Craig Jensen	Craig Jensen	BMI	614-424-5170
Jim Hallgren		BMI	614-424-7961
Regina Kight	Regina Kight	BCLDP	614-424-5061
Steve Schmidt		BCLDP	614-424-3314
Gretchen Fearnung	Gretchen Fearnung	BCLDP	614 424-7045
Tracy Chance		BCLDP	614-424-7876
Jan Gauthier	Jan Gauthier	BCLDP	614-424-5353
Eric Denison	Eric Denison	ODH-BRP	614-995-0761
Larry Sanders		BCLDP	614 424-4852
Gene McCoy	Gene McCoy	NRC	630 829 9836
Michael M. LaFrance	Michael M. LaFrance	USNRC	630-829-9865
Doug Winkiller	Doug Winkiller	BCLDP Safety Director	(614) 424-4967
Patrick Weaver		BCLDP	614-424-6376
Gene Roe	Gene B. Roe	BCLDP	614-424-4344
April C. Chance	April C. Chance	BCLDP	614-424-3883
Joe Santos	Joseph Santos	"	614 424-4961
Joseph Crondie	Joseph Crondie	ODH	614 728-5734

EXERCISE ONLY

West Jefferson Site: North Area



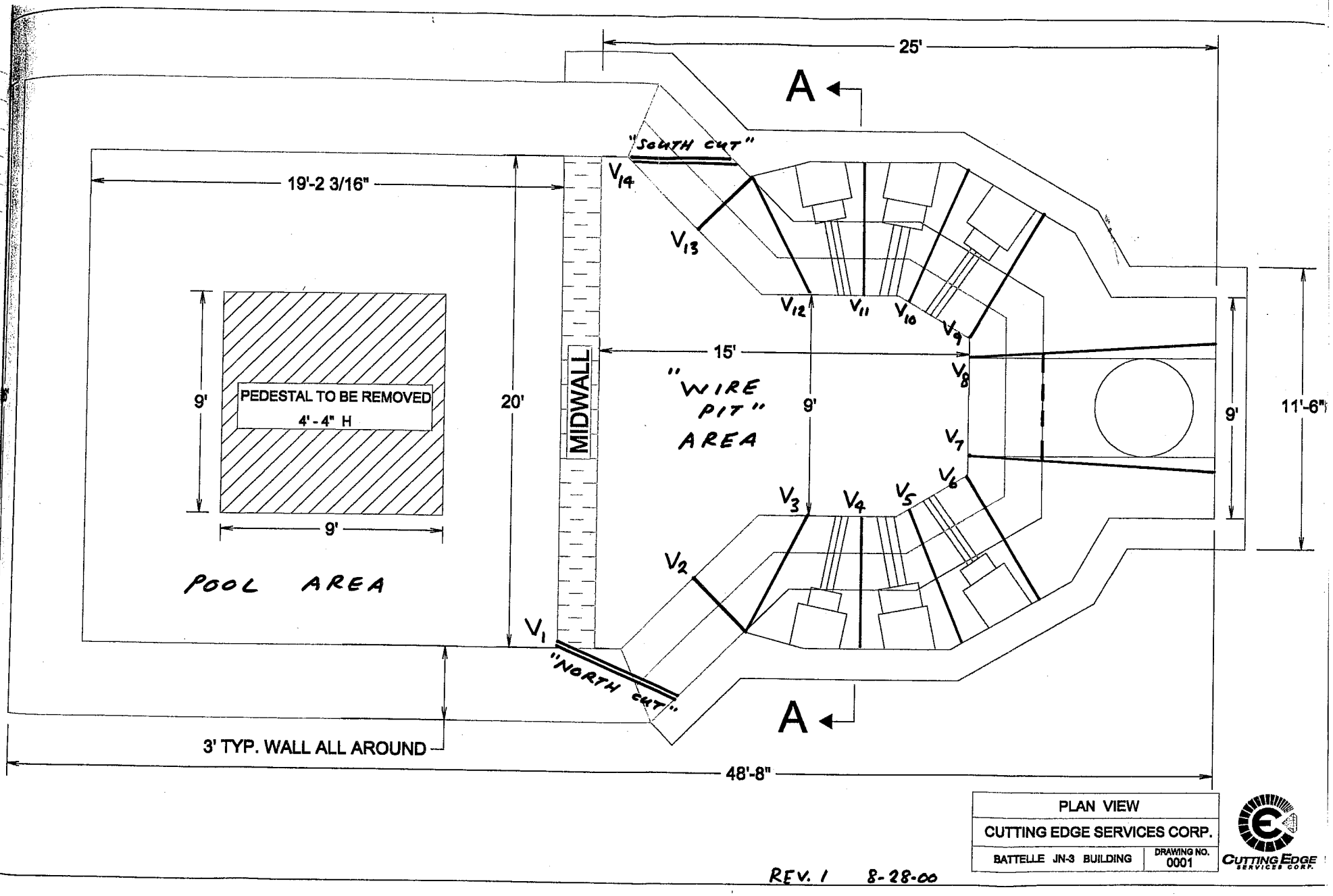
Contaminated Area
Facility Damage



SECTION A-A

CUTTING EDGE SERVICES CORP.

DRAWING NO



PLAN VIEW	
CUTTING EDGE SERVICES CORP.	
BATTELLE JN-3 BUILDING	DRAWING NO. 0001

REV. 1 8-28-00

CUTTING EDGE SERVICES CORP.