



0058518

AIR 02-1208  
NOC ID 24

STATE OF WASHINGTON

DEPARTMENT OF HEALTH

DIVISION OF RADIATION PROTECTION

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December 5, 2002

Mr. Joel B. Hebdon, Director  
U. S. Department of Energy  
Regulatory Compliance  
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Richland, Washington 99352

Mr. James E. Rasmussen, Director  
U. S. Department of Energy  
Office of River Protection  
Environmental Management Division  
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Richland, Washington 99352

Addressees:

My staff has completed the review of NOC Application/ Permit Revision Form approved November 13, 2002, for the 105 KE Basin Fuel Removal, DOE/RL-96-101, Revision 2B.

The conditions, controls, monitoring requirements and limitations for this project (NOC ID 24) are enclosed and **replace all previous conditions of approval and will be included in the next issuance of the Hanford Site Air Operating Permit as an Administrative Amendment/Off Permit Change.** These conditions must be observed in order to be in compliance with our regulations. Failure to meet these conditions and limitations may result in the revocation of approval, and the issuance of Notices of Violation, and other potential enforcement actions under WAC 246-247-100.

These conditions and limitations apply to this NOC only. This approval does not apply to future projects without further review and approval by the Department of Health.

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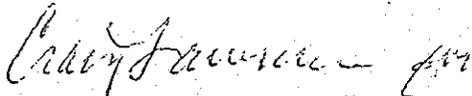
EDMC



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If you have any questions regarding the approval, please call me at (360) 326-3261 or Randy Acselrod at (509) 727-0643.

Sincerely,



Allen W. Conklin, Supervising Health Physicist  
Air Emissions and Defense Waste Section  
Division of Radiation Protection

AWC/RSA/jr

Enclosure: Conditions and Limitations

cc: Dennis Bowser, DOE-ORP  
Mary Jarvis, DOE-RL  
Jerry Leitch, EPA  
Nick Ceto, EPA  
Stephen Lijek, Ecology  
Oliver Wang, Ecology  
Bill Green, FH  
Carol Rodriguez, DOE  
Dave Watson, FH

Fax: WDOH-RL December 5, 2002

DEPARTMENT OF HEALTH  
RADIOACTIVE AIR EMISSIONS  
NOTICE OF CONSTRUCTION  
APPROVAL FOR

**PROJECT TITLE: 105-KE BASIN FUEL REMOVAL**

Date Approved: 05-Dec-02

Emission Unit Name: 105-KE VENTS

Emission Unit ID 190

This is a MINOR, ACTIVELY ventilated emission unit.

**This emission unit requires the following Abatement Technology:**

Applicable Requirements: ALARCT

ALARACT [WAC 246-247-040(4)]  
BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
	Sandfilter	1	
	Cartridge filter	2	2 in parallel (if required)
	Ion exchange	2	2 in parallel
	Recirc pump	2	2 in parallel
	Skimmer pump	1	1 in parallel (if required)
	Chiller	1	
	Water Basin	1	Configuration of equipment may change based on water action levels and basin activities.

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

**This emission unit has the following Monitoring and Sampling Requirements:**

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Federal and State Regulatory	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
40 CFR 61.93[b][4][i] & WAC 246-247-075[3]	Appendix B, Method I14(3)	Gamma Scan	Monthly Sample
<b>Sampling Requirements:</b> Record Sample			

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

**Change History**

09/09/1993 Original approval given on September 9, 1993 via AIR 93-908.

10/14/1993 NOC revision approved on October 14, 1993 via AIR 93-923.

03/05/1997 NOC revision approved on March 5, 1997 via AIR 97-206.

- 03/19/1997 Telecom March 19, 1997 provided an amendment to AIR 97-206 to allow above water work.
- 09/15/1998 NOC Revision approved in RTAM meeting minutes.
- 03/07/2000 NOC revision form approved March 7, 2000 provided a process description change.
- 03/07/2001 NOC Application/Permit Revision form approved March 7, 2001 via approval number AIR 01-504, changed/clarified conditions.
- 07/16/2001 NOC Revision (DOE/RL-96-101, Revision 1) received July 16, 2001.
- 10/04/2001 NOC Revision (DOE/RL-96-101, Revision 2) received October 4, 2001. This review incorporates all comments from Revision 1.
- 05/07/2002 NOC change to reflect changes in Fuel Annex design. NOC Revision 2, DOE/RL-96-101 approved in RTAM on May 7, 2002. This is a CERCLA Facility. No approval letter needs to be generated. No additional conditions and limitations need to be added. This concurs with EPA on changes to the Fuel transfer Annex Design.
- 11/15/2002 NOC Revision Form, DOE/RL-96-101, Rev 2B, approved on November 13, 2002 to address alternative methods for underwater sludge movement. This change in description is provided in the conditions and limitations, AIR 02-1208, mailed on December 5, 2002.

### CONDITIONS AND LIMITATIONS

- 1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).
- 2) The total abated emission limit for this Notice of Construction is limited to  $5.11E-04$  mrem/year to the Maximally Exposed Individual (WAC 246-247-040(5)). The total limit on the Potential-To-Emit for this Notice of Construction is limited to  $4.18E-03$  mrem/year to the Maximally Exposed Individual (WAC 246-247-030(21)).
- 3) **No activities, other than those explicitly described within this approval, shall be conducted without prior written approval. The approved activities are limited to:**  
 activities necessary to remove spent nuclear fuel from the 105 K East (KE) Basin and transport the fuel to the 105 K West (KW) Basin to be prepared to be transported to the Cold Vacuum Drying Facility (CVDF). Removal and transport of the fuel is limited to the four following program elements: supporting construction activities necessary to provide the specialized equipment to do the work, processing underwater fuel and treating associated water by the existing water treatment system, removing the fuel from the water and transporting the fuel to the KW Basin, and handling of fuel retrieval byproducts including debris and sludge.

The fuel retrieval process is limited to being conducted underwater. The process will encompass placing up to 10 canisters into a Shielded Transfer Cask (STC) underwater. Underwater operations involve the use of hoists and lifting tools similar to those used in the past. Following this, the STC lid will be closed underwater. The STC will be removed out of the basin pool by way of an underwater lift system in the dummy elevator pit area. The STC will then be rolled into the cask transfer annex and be placed into a cask transfer overpack (CTO). This is done to minimize and isolating any surface contamination from the environment. The STC/CTO will then be transferred to the KW Basin where it will be unloaded. Once unloaded the STC/CTO will return to the KE Basin for the next loading. This will be repeated until all the canisters loaded with SNF are removed. Any residual sludge in the STC may be transferred by moving it to an under water sludge accumulation area. Underwater operations shall involve the use of manipulators to handle the fuel, although some (above water) hoists will be used to handle MCO baskets and canisters. The use of long-handled tongs or similar tools will supplement

the manipulators as necessary. The radionuclides dispersed within the water during this process shall be collected and treated by the existing water treatment system.

Construction activities are limited to the installation of uncontaminated equipment in the basin, portions of equipment placed underwater on the floor of the basin and portions of equipment installed above water.

During the installation of fuel transfer system (FTS), the project is allowed to remove, reconfigure, reinstall, and test such equipment. Follow as low as reasonably achievable (ALARA) methods to control contamination.

The FTS operation shall retrieve the fuel from storage locations in the basin, load the fuel into STC and load the STC into a CTO. All FTS operations occur in the basin and the cask transfer annex.

The existing water treatment system shall maintain basin water quality during fuel retrieval and removal activities.

The existing water treatment system shall treat the basin water by filtration and ion exchange.

Water in the basin shall be managed as a closed-loop system, with the water continually being removed from the basin, the majority of which will be circulated through the treatment system and returned to the basin.

In the transfer bay area, excess treated basin water shall be removed. Water shall be removed via a connection located in the transfer bay. This water shall be pumped to a tanker truck and transported to the 200 Area Effluent Treatment Facility (200 Area ETF). The tanker truck shall be equivalent to the truck currently being used to transport water from the 100 N Emergency Dump Basin to the 200 Area ETF. The tanker truck shall be located either in a transfer bay or in an adjacent enclosure.

The current water treatment system shall remain operational during all underwater operations disturbing the sludge or SNF source term.

Additional equipment shall be placed on line as necessary to maintain water quality.

4) The Annual Possession Quantity is limited to the following radionuclides (Curies/year):

Am - 241	2.03E+05	Am - 242 m	1.14E+02	Am - 242	1.14E+02
Am - 243	7.12E+01	Ba - 137 m	6.26E+06	C - 14	3.62E+02
Cd - 113 m	1.84E+03	Ce - 144	1.09E+03	Cm - 242	9.42E+01
Cm - 244	8.84E+02	Co - 60	1.96E+03	Cs - 134	7.99E+03
Cs - 135	3.96E+01	Cs - 137	6.61E+06	Eu - 152	4.77E+02
Eu - 154	5.48E+04	Eu - 155	1.19E+04	Fe - 55	1.08E+03
H - 3	1.84E+04	I - 129	3.26E+00	Kr - 85	2.92E+05
Nb - 93 m	1.24E+02	Ni - 59	2.11E+01	Ni - 63	2.31E+03
Np - 237	3.02E+01	Pd - 107	8.59E+00	Pm - 147	2.73E+05
Pr - 144	1.08E+03	Pr - 144 m	1.31E+01	Pu - 238	6.07E+04
Pu - 239	1.15E+05	Pu - 240	6.38E+04	Pu - 241	2.60E+06
Pu - 242	3.07E+01	Rh - 106	1.84E+03	Ru - 106	1.84E+03
Sb - 125	1.88E+04	Sb - 126	1.13E+01	Sb - 126 m	8.07E+01

Se - 79	4.35E+01	Sm - 151	8.95E+04	Sn - 119 m	3.82E-01
Sn - 121 m	4.03E+01	Sn - 126	8.07E+01	Sr - 90	5.01E+06
Tc - 99	1.45E+03	Te - 125 m	4.57E+03	U - 234	4.66E+02
U - 235	1.77E+01	U - 236	6.61E+01	U - 238	3.80E+02
Y - 90	5.01E+06	Zr - 93	2.01E+02		

- 5) **This condition was obsoleted on 3/7/2001.** Water sampling must be done once per shift during fuel retrieval, debris removal, or sludge disturbance underwater.

*Added by NOC revision approved via AIR 97-206. Obsoleted by NOC Application/Permit Revision form approved March 7, 2001 via AIR 01-504.*

- 6) **This condition was obsoleted on 4/26/2001.** This activity involves the retrieval and transport of fuel to the KW Basin. It includes the installation of new equipment, fuel removal and sludge relocation activities expected to be routine in the future.

*Added by NOC revision approved via AIR 97-206. Obsoleted by process description.*

- 7) The required controls for all underwater work includes the basin water and existing water treatment system. All operations shall cease and the department notified if Cs-137 water concentrations reach 30 microcuries per liter. If concentrations reach 15 microcuries per liter, incremental filtration equipment not yet in service shall be added to maintain water quality below the action level.

- 8) All work above water with a potential for airborne contamination must be performed in containment, (e.g., glovebags, green houses, other containment devices).

- 9) **This condition was obsoleted on 4/26/2001.** An additional three continuous air monitors are required during all above water work. These monitors shall be set to a low level of detection as an early alert of potential airborne contamination problems.

*Added by NOC revision approved via AIR 97-206. Obsoleted by new condition added to reflect agreement reached during meeting held March 26, 2001 via 01-504.*

- 10) During SNF and debris retrieval and removal activities, a minimum of one of the ion exchange systems and the particulate filtration system must be in operation, as described in the NOC. In addition, any activity that re-suspends the sediment will also require one of these systems to operate

- 11) **This condition was obsoleted on 10/4/2001.** Prior to beginning actual encapsulation of fuel or sediment or cleaning and crushing canisters, DOH will establish two water radionuclides concentration action levels, with input from Westinghouse health physicists.

a. When the lower level is reached or exceeded, the ion exchange column and ion exchange module will both be placed in operation, OR all underwater encapsulation activities will cease until the radionuclide concentration level falls below the action level.

b. When the higher action level is reached or exceeded, it will be mandatory for all underwater activities to cease until both ion exchange systems lower the radionuclide concentration to below the lower level.

*Original condition per AIR 93-908. Obsoleted by KE Basin Fuel Removal NOC approved October 4, 2001.*

- 12) **This condition was obsoleted on 3/6/2001.** A minimum of one water sample per shift (during underwater encapsulation activities) is required to determine radionuclide concentration levels. The details of this sampling requirement (location of samples, grab verses composite, multiple verses single, turn around time, radionuclides analyzed, etc.) will be determined by DOH prior to the start of any underwater encapsulation activities. Preparatory work (pre-encapsulation activities) may,

however, commence immediately.

*Original condition per AIR 93-908. Obsolete by RTAM revision form submitted March 7, 2001 via AIR 01-504.*

- 13) **This condition was obsolete on 10/4/2001.** Only those activities described in the NOC are approved, with two additions; leak detection activities may proceed, plus installation of the suction header and associated equipment described in the draft Engineering Change Notice No. 160489. Leak detection work causing significant sludge resuspension will be subject to water concentration action levels set by DOH.

*Original condition per AIR 93-908. Field work complete.*

- 14) **This condition was obsolete on 10/4/2001.** Empty canisters will not be removed from the basin concurrent with encapsulation activities involving fuel or sediment.

*Original condition per AIR 93-908. Obsolete by KE Basin Fuel Removal NOC Approved October 4, 2001.*

- 15) Canisters (or other equipment) can be removed from the water only when the radionuclide concentration in the water is below the lower action level.

- 16) Above water work involving any radionuclide source term must be collocated adjacent to alpha and beta Continuous Air Monitors (CAM). DOH will establish alarm set points, with input from Westinghouse health physicists.

- 17) **This condition was obsolete on 10/4/2001.** A "greenhouse" must be erected adjacent to any above water work involving radionuclides. Contaminated material must be immediately bagged in plastic, moved into the greenhouse or returned to the water. This greenhouse must be actively ventilated through HEPA filtration when any loose or smearable contamination is present inside. If CAMs alarm at the established set points, any contaminated material must be immediately placed in the greenhouse or returned to the water.

*Original condition per AIR 93-908. Obsolete by NOC revision approved March 7, 2000.*

- 18) **This condition was obsolete on 10/4/2001.** DOH will establish airborne radionuclide emission limits for all encapsulation activities, with input from Westinghouse health physicists, prior to commencement of encapsulation of fuel or sludge. The point of compliance will be fixed head samplers at the building exhaust points.

*Original condition per AIR 93-908. Obsolete by KE Basin Fuel Removal NOC approved October 4, 2001.*

- 19) **This condition was obsolete on 10/4/2001.** The sludge encapsulation procedure must be provided to DOH before encapsulation commences. Pre-encapsulation activities may proceed.

*Original condition per AIR 93-908. Obsolete by Fuel Removal NOC approved October 4, 2001.*

- 20) Power must be provided for an ambient air sampler for DOH at a location designated by the department's Environmental Radiation Section.

- 21) The DOH reserves the right to inspect the facility at any time.

- 22) The DOH approval is contingent on the U.S. DOE receiving approval from the Environmental Protection Agency for the radionuclides NESHAPs.

- 23) **This condition was obsolete on 10/4/2001.** DOH must be notified of encapsulation start-up. We also request periodic updates of preparatory work.

*Original condition per AIR 93-908. Obsolete by KE Basin fuel Removal NOC Approved October 4, 2001.*

- 24) **This condition was obsolete on 4/26/2001.** The Higher Action Level shall be 3.0 E-2

microcuries/ml.

*Original condition per AIR 93-908. Obsoleted by NOC Application/Permit Revision form approved March 7, 2001, AIR 01-504*

- 25) **This condition was obsoleted on 4/6/2001.** The Lower Action Level shall be 1.5E-02 microCurie/ml.  
*Original condition per AIR 93-908. Obsoleted by NOC Application/Permit Revision form approved March 7, 2001, AIR 01-504.*
- 26) Transmit the procedures used to collect water samples, and to analyze the water samples taken once per shift.
- 27) **This condition was obsoleted on 10/11/2001.** Describe the possibility of piping around the ion exchange columns to operate the associated cartridge filters separated from the ion exchange columns.  
*Condition added by AIR 93-923. Item closed.*
- 28) Provide a central location for the following information updated at least monthly:
- The constant air monitor sample analyses.
  - The in-house water sample analyses.
  - The routine contamination surveys.
  - The results of Kr-85 and Tritium monitoring.
- 29) **This condition was obsoleted on 4/26/2001.** Transmit semi-annually, the weekly (raw data) water and air sample laboratory results.  
*Condition added by AIR 93-923. Obsoleted by prior agreement with the department.*
- 30) **This condition was obsoleted on 4/26/2001.** Provide quarterly confirmation measurements for Pu-241.  
*Condition added by AIR 93-923. Obsoleted by prior agreement with the department.*
- 31) **This condition was obsoleted on 10/4/2001.** The department will have access to inspect the encapsulation activities 24 hours/day.  
*Condition added by AIR 93-923. Obsoleted by Fuel removal NOC approved October 4, 2001.*
- 32) **This condition was obsoleted on 10/11/2001.** Provide documentation that describes criticality concerns in KE-Basin water filtration equipment.  
*Condition added by AIR 93-923. Documentation provided. Closed after inspection of July 17, 1997.*
- 33) **This condition was obsoleted on 10/4/2001.** The ALARA concept proposed in the NOC is not definitive enough for the department to approve. Therefore, all work above water with a potential for airborne contamination must be performed in containment. Authorized work above water involving contaminated equipment or materials is limited to:
- Maintenance activities performed on fuel removal equipment.
  - Routine activity contamination control practices.
  - All items removed and let out of the water.
  - Maintenance on components that directly contact the fuel such as end effectors on manipulators.

Clarification:

(1a) The above applies to any above water activity addressed in the NOC, with the potential for airborne contamination, and if not performed in containment shall require that activities be co-located with alarming continuous air monitors (CAMs), which shall be operated according to procedures agreed upon between WDOH and DOE/RL. WDOH confirmed that bagging immediately, putting in a greenhouse, or returning to water are still acceptable practices for debris removal from the basin.

(1b) Contaminated material (including removed debris) shall be immediately bagged in plastic, moved into a greenhouse or returned to the water. The required greenhouses shall be actively ventilated through HEPA filtration when any loose or smearable contamination is present inside.

(1c) See the approved 9/12/1995 "Routine Activities" controls which are acceptable for this work.

*Added by Telecom March 19, 1997 as an amendment to AIR 97-206. Obsoleted by NOC Revision and Phone conversation with DOE October 4, 2001.*

34) Authorized work above water involving contaminated equipment or materials are limited to: Maintenance activities performed on fuel removal equipment; routine activity contamination control practices; all items removed and left out of water; and maintenance components that directly contact the fuel such as end effectors on manipulators.

35) **This condition was obsoleted on 10/4/2001.** All items shall be promptly bagged after cutting for transport and disposal.

*Added by Telecom March 19, 1997 as an amendment to AIR 97-206. Obsoleted by KE Basin Fuel removal NOC and telephone conversation with DOE on October 4, 2001.*

36) NOTE: Some of the A.R.s were satisfied by letter DOE/RL 97-EAP-349, dated 4/2/97.

37) Water action levels of 15 uCi/liter shall require incremental water filtration equipment not yet in service (e.g., hydrocyclones, back flushable mechanical filters, sandfilter, cartridge filter).

38) **This condition was obsoleted on 4/26/2001.** Some items removed from the south loadout pit may extend a few feet into the water and shall be rinsed and promptly bagged into plastic.

*Added by Telecom March 19, 1997 as an amendment to AIR 97-206. Obsoleted by new condition added to reflect agreement reached during meeting held March 26, 2001 via AIR 01-504.*

39) If basin water quality is equal to or less than 10 uCi/liter Cs-137, water sampling shall be done once per day with the results available the next working day.

40) If basin water quality is greater than 10 uCi/liter Cs-137, water sampling shall be done once per shift with the result available by the end of the next following shift.

41) **This condition was obsoleted on 10/11/2001.** Additional continuous air monitors are required during all above water work. These monitors shall be set to a low level of detection as an early alert of an potential airborne contamination problems. These shall be operational prior to removing fuel from the basin. Number of monitors and placement shall be approved by the department.

*Condition added to reflect agreement reached during meeting held March 26, 2001 via AIR 01-504.*

42) **This condition was obsoleted on 10/4/2001.** Items removed from the basin water shall be rinsed