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STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

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August 19, 1999

Mr. Alan J. Dobson, Operations and Safety Head
River Protection Project – Waste Treatment Plant
British Nuclear Fuels, Inc.
3000 George Washington Way
Richland, Washington 99352

Dear Mr. Dobson:

Thank you for your letter of July 29, 1999, (received August 4, 1999) outlining British Nuclear Fuels, Inc.'s (BNFL's) proposed approaches for storage of immobilized glass waste. Thank you also for the briefing your staff provided Washington State Department of Ecology (Ecology) staff on the same issue July 7, 1999.

This letter is to communicate in three (3) areas. First, a brief outline of Ecology's overall understanding of the immobilized glass container storage issues specific to the River Protection Project - Waste Treatment Plant (RPP – WTP). This is immediately below. Second, a summary of the requirements from the Dangerous Waste Regulations (Chapter 173-303 Washington Administrative Code [WAC]) that Ecology believes apply to immobilized glass waste accumulation, storage, and handling. Third, a summary of Ecology's understanding of your proposals to comply with the regulations, and response. The regulation summaries, understandings of your proposals, etc., are divided into the five (5) issues identified in your letter: container labeling, container storage, material compatibility, containment system design, and container and container storage inspections. Please note, the regulation summaries are to support this discussion only. In all cases, you should refer to the actual regulations.

In addition, for each issue area, we have included specific information on the types of permit conditions for immobilized glass waste container storage that we anticipate based on the documents we have reviewed to date. For ease of discussion, these paragraphs are numbered consecutively from beginning to end of this letter. Please note, this is for discussion purposes only. As you know, final permit conditions are developed through a public process in which both your proposals and the concerns of other stakeholders will be considered. As part of promoting an open and inclusive permitting process for the RPP – WTP, Ecology will post this letter on its Internet page about RPP – WTP permitting. Ecology would also like to post your letter of July 29, 1999; to facilitate, please send an electronic copy.

As discussed, the current schedule calls for a final decision to be made on the RPP – WTP permit modification to the Hanford Facility Permit significantly in advance of when you plan to begin to accept dangerous or mixed waste at the RPP – WTP facility. Schedules of compliance can be used in the final permit to address some issues after the final permitting decision is made - but before waste is accepted at the RPP – WTP facility. To the extent you are interested in taking that approach for any given issue, please let us know.

Finally, Ecology has prepared this letter in consideration of our discussions to date. As work on your permit application continues, new issues may be identified and our thinking on these issues may evolve. The information in this letter is specific to the RPP – WTP and should not be taken as an indication of Ecology policy at any other dangerous waste treatment, storage, or disposal unit or facility.

Understanding of BNFL's Immobilized Glass Waste Container Management Strategy

Ecology understands that, due to radiological hazards, containers of immobilized glass waste cannot be contact handled (i.e., they will be handled only with remote systems). Similarly, humans cannot directly inspect the containers. Visual inspections will be conducted by remote operated camera. Immobilized glass waste containers will be tracked using a tracking system that will record, among other things, when containers are placed into storage, removed from storage, and moved within storage areas. Ecology understands that the molten glass will be placed in new (un-used) containers, then the glass and containers will be allowed to cool, and finally, the containers will be permanently sealed. Containers will meet certain design specifications. Container accumulation and storage areas will be totally enclosed, indoors, and meet certain design specifications. Access to immobilized glass waste container accumulation, storage, and handling areas will be controlled/prevented.

After containers are permanently sealed, Ecology understands that there is no plan to (and no design elements to support) opening containers to add, remove, or transfer waste. Any given volume of immobilized glass waste will stay in its container for the foreseeable future. There will be no free liquids in the containers of immobilized glass waste. The major risk(s) associated with immobilized glass waste will be consistent, that is, all the containers of low activity immobilized glass waste will present the same major risk(s) and all the containers of high activity immobilized glass waste will present the same major risk(s). Fire response in immobilized glass waste container accumulation and storage areas will be dry chemical suppression; water will not be used. When immobilized glass waste containers are removed from the RPP – WTP they will first be packed for shipment.

It is in the context of these understandings that Ecology responds to your specific proposals for container management, below. If we are in error in any of these understandings, or if you would like to clarify any of these areas, please let us know as soon as possible.

Container Labeling

Under WAC 173-303-630(3), owners/operators of facilities at which dangerous waste is stored in containers must: (1) label dangerous waste containers in a manner which adequately identifies the major risk(s) associated with the contents of the container for employees, emergency response personnel, and the public; (2) affix labels upon transfer of dangerous waste from one container to another; (3) destroy or otherwise remove labels from emptied containers; and, (4) ensure that labels are not obscured, removed, or otherwise unreadable in the course of inspection. There are also labeling requirements for generators of hazardous waste that accumulate waste in containers. See WAC 173-303-200.

For containers of immobilized glass waste, you have proposed to meet the labeling requirements by: (1) labeling each container with a unique identifier that is welded to the shoulder of each container visible to camera surveillance systems and maintaining a computer tracking system that records, by unique identifier, details about a container's contents and other information; and, (2) providing appropriate warning signs indicating hazardous materials and radiation around the storage and process areas. Based

on your proposal, Ecology's understanding of anticipated facility design and operation, and the dangerous waste regulations, we anticipate that permit conditions for immobilized glass waste container labeling will, at a minimum, require you do the following:

1. Label each container with a unique identifier at two (2) locations on the shoulder of the container, 180 degrees apart, with lettering at least two (2) inches high by 1½ inches wide by ¼ inch. Ecology anticipate's that this condition will specify the details of the unique identifier (alpha, numeric, combination) and procedures to ensure that each container identifier is, indeed, unique among RPP – WTP immobilized glass waste containers. So Ecology may consider your plans when developing the details of this condition, in your permit application, please provide the details of the unique identifier you propose and procedures you plan to use to ensure that each identifier is unique.

2. Maintain a tracking system that, by unique container identifier: tracks the location of containers in the process and storage areas; tracks which containers have been shipped off-facility and to where they have been shipped; records the date glass waste was first placed in its container; and, records the nature of the glass waste in any given container including dangerous waste designation codes, any associated land disposal restriction treatment requirements, and the major risk(s) associated with the glass waste. Ecology anticipates this condition will specify the details of the container tracking system and system maintenance, including the elements of the system, format of the system (electronic, paper, other), provisions to ensure access to the system for plant personnel, Ecology inspectors and emergency responders, a quality assurance/quality control system to control the quality of inputs to the system and to evaluate system performance, and record retention. So we may consider your plans when developing this permit condition; in your permit application, please provide your proposals as to the details of the tracking system including those specific details identified above.

3. Post all entrances and access points to storage and accumulation areas and any other areas at which you will handle containers of immobilized glass waste with signs that, in addition to meeting the requirements of WAC 173-303-310(2)(a), clearly identify the major risk(s) associated with the glass waste. Ecology anticipates this condition will require signs for each specific area of the facility where immobilized glass waste will be accumulated, stored, or otherwise handled rather than, for example, the perimeter of the entire RPP – WTP facility. So Ecology may accurately develop this requirement, in your permit application, please specifically identify the locations at which immobilized glass waste containers will be accumulated, stored, or otherwise handled and all entrances and other access points to these locations.

4. Control or prevent access to immobilized glass waste container storage, accumulation, and other handling areas. So Ecology may consider your plans when developing this permit condition, in your permit application, please describe the procedures you plan to use to control or prevent access to immobilized glass waste container areas.

5. When containers of immobilized glass waste are prepared for shipment, label each shipping container with a label that identifies the major risk(s) associated with the contents of the container and reiterates the unique identifying number for the container. So Ecology may consider your plans when developing this permit condition, in your permit application, please indicate specifically how you intend to prepare and label containers for shipment. Note that, Hanford Facility Permit general condition II.Q also governs transportation of wastes on the Hanford Facility.

6. Ensure the unique container identifier is, at all times, visible through inspection by remote camera. Ecology expects the facility description and design you submit with your permit application to document the provisions for inspection by remote camera and that the unique container identifiers can always be viewed by, for example, showing the proposed arrangement of containers in the storage, accumulation, and other handling areas, the placement and ranges of cameras for any permanent cameras, and access points and ranges for any other cameras.

Container Storage and Management

Under WAC 173-303-630(5), owners/operators of facilities at which dangerous waste is stored in containers must manage dangerous waste containers in a manner that ensures: containers are always closed except when it is necessary to add or remove waste; containers are not opened, handled, or stored in a way that may rupture the container or cause it to leak; and, a minimum thirty-inch (30 in.) separation is maintained between aisles of containers, and rows of containers are not more than two (2) containers wide.

For immobilized glass waste containers, you have proposed that, after containers are filled with glass they will be permanently sealed. For container spacing, you have proposed alternative spacing of six (6) inches between containers of low-activity waste and sixteen (16) inches between containers of high-activity waste. Your letter outlines why you believe this alternative container spacing is protective of human health and the environment and more appropriate given the waste- and site-specific conditions expected at your facility (e.g., no person-access; material is solid; containers moved and inspected remotely; limited combustible material and fire initiation sources within the container storage areas).

Based on your proposal, Ecology's understanding of anticipated facility design and operation, and the dangerous waste regulations, at this time, we are convinced that the alternative spacing requirements for immobilized glass containers you propose will protect human health and the environment. Assuming appropriate design of the container storage areas (see containment section) and container inspection and tracking procedures (see labeling and inspection sections), Ecology anticipates that permit conditions for immobilized glass container management will, at a minimum, require you do the following:

7. Completely and permanently seal containers of immobilized glass waste prior to placing in storage. Ecology anticipates this condition will specify both a time period after the container is filled with molten glass within which the sealing must take place, the performance criteria and/or operating parameters for the sealing process and completed seal, and a quality assurance/quality control program for the sealing process and container seals. So Ecology can consider your plans in this area, in your permit application, please include your proposals for the details of the immobilized glass waste container sealing process.

8. Handle and store sealed containers (and containers awaiting sealing) in ways that will not rupture the containers or cause them to leak. Ecology anticipates this condition will specify handling procedures associated with crane operation and other remote handling methods. So we can consider your plans in this area, in your permit application, please include the operating procedures you plan to use for crane operation and other remote handling methods to ensure that containers will not rupture or be caused to leak.

9. Accumulate, store, and otherwise handle immobilized glass waste containers only in designated locations (the exact locations will be specified, based on your permit application) and maintain container spacing of no less than six (6) inches between containers of low-activity waste and sixteen (16) inches between containers of high-activity waste. Ecology understands, from conversations, that in addition to the design elements discussed in your proposal (reinforced concrete, etc.), immobilized glass container storage areas will comply with robust seismic design criteria to ensure, for example, that containers do not fall over or into each other. So we can consider your plans in this area, in your permit application, please include information on the seismic standards that will be applied to design of immobilized glass container storage and accumulation areas.

Please note, while Ecology will not evaluate or respond to each element of your justification for alternative spacing and, as discussed above, we anticipate the alternative container spacing you propose will protect human health and the environment considering the specifics circumstances of your facility, your assertion that fire protection, spill control equipment, and decontamination equipment is not necessary within immobilized glass container storage areas addresses only the possibility of a fire initiating within the immobilized glass container storage areas. It does not seem to address the possibility of a fire initiating somewhere else at the facility and then involving the immobilized glass container storage areas. This is also an issue for containment (see below). In the context of your emergency response/contingency plan, we would like to discuss the likelihood of a fire spreading from another part of the facility into the immobilized glass container storage areas and the need to provide for dry fire suppression within the container storage areas and removal of used fire suppression materials from the container storage areas.

Compatibility of Waste with Containers

Under WAC 173-303-630(4), owners/operators of facilities at which dangerous waste is stored in containers must use a container made of or lined with materials that will not react with, and are otherwise compatible with, the dangerous waste to be stored so that the ability of the container to contain the waste is not impaired.

Ecology understands that based on experience with the U.S. Department of Energy (DOE)-complex wastes at Oak Ridge National Laboratory and Savannah River Technology Center, you are planning to use austenitic stainless steel (304L stainless) for the immobilized glass waste containers and believe that 304L stainless is physically and chemically compatible with Hanford immobilized glass waste. We also understand that studies are on-going to document and confirm your beliefs. Like you, Ecology knows of nothing that leads us to believe 304L stainless steel would be incompatible with Hanford immobilized glass waste and anticipate that 304L stainless steel will be an appropriate material for containers of immobilized glass waste; however, of course, a final determination of compatibility cannot be made until the studies are complete. We look forward to the results of your studies.

Containment

Requirements for dangerous waste container storage containment systems are at WAC 173-303-630(7). WAC 173-303-630(7)(a) and (b) specify the requirements for containment systems. WAC 173-303-630(7)(c) provides that if dangerous waste stored in containers does not contain free liquids, does not exhibit the characteristic of ignitability or reactivity, and is not designated as F020, F021, F022, F023, F026, or F027, a containment system is not required, as long as the container storage area is sloped or

otherwise designed and operated to drain and remove liquid resulting from precipitation or containers are elevated or otherwise protected from contact with accumulated liquids. Under WAC 173-303-630(7)(d), Ecology may require that dangerous waste storage areas be protected from the elements by a building or other protective cover if certain conditions are met.

For low-activity immobilized glass waste containers, you have proposed storage in a completely enclosed room with steel reinforced concrete walls approximately two (2) feet thick, a four (4) foot thick steel reinforced sealed concrete floor, and a four (4) foot thick concrete slab roof covered with a waterproof membrane. For high-activity immobilized glass waste containers, you have proposed storage in a completely enclosed room with approximately five (5) foot thick steel reinforced concrete walls, floor, and roof. Fire suppression, if necessary, will be with dry suppression materials. You propose that this design and operating approach adequately protects containers from contact with accumulated liquids since the immobilized glass waste does not contain free liquids and no liquids will enter into the container storage areas through precipitation or fire response.

Based on your proposal, Ecology's understanding of anticipated facility design and operation, and the dangerous waste regulations, at this time, we believe that the container storage area design you propose will adequately protect containers from contact with accumulated liquids and will protect human health and the environment. We anticipate that permit conditions for design and operation of immobilized glass container storage areas will, at a minimum, require you do the following:

10. Store immobilized glass containers only in specific locations (which will be specified in the permit). These locations must be completely enclosed, indoors, and must be designed and operated in a way that prevents infiltration of liquids from precipitation and other likely sources (e.g., any overhead piping; any anticipated "sweating" of containers). So Ecology can accurately develop this permit condition, please identify the specific immobilized glass waste container storage locations in your permit application and provide design detail to document that the infiltration of liquids from precipitation and other likely sources is prevented. Ecology will assess the ability of the container storage area to adequately protect containers from contact with accumulated liquids through our review of your specific proposed design and operation procedures for the areas. Assuming the design is adequate, the permit will specify the areas in which immobilized glass waste may be stored, require that the areas be constructed as designed, and specify any operating requirements. As part of this condition, Ecology may require periodic inspection to verify continued integrity of the waterproof membranes preventing infiltration of precipitation into the concrete slab roofs. So Ecology can consider your plans in this area, in your permit application, please provide your plans to verify continued integrity of the waterproof roof membranes.

11. In the immobilized glass waste storage areas, store only dangerous wastes and mixed wastes that do not contain free liquids, do not exhibit either the characteristic of ignitability or reactivity as described in WAC 173-303-090(5) or (7), and are not designated as F020, F021, F022, F023, F026, or F027.

12. Conduct fire response only with dry fire suppression materials; do not use water. Ecology currently anticipates that the need for dry fire suppression capability within the immobilized glass container storage areas, and removal of any used fire suppression materials from the areas, will be addressed through development of your emergency response plan. We would like to discuss how the

design of the container storage areas address the possible need to apply and remove dry fire suppression materials.

Container and Container Storage Inspection

Under WAC 173-303-630(6), owners/operators of facilities at which dangerous waste is stored in containers must inspect the container storage area and look for leaking containers and for deterioration of containers and the containment system caused by corrosion, deterioration, or other factors. These inspections must occur at least once per week. Facility owners/operators must keep a log of these inspections including, at least, the date and time of the inspection, the printed name and the handwritten signature of the inspector, a notation of the observations made, and the date and nature of any repairs or remedial actions taken. The inspection log must be kept at the facility for at least five (5) years from the date of inspection. Under WAC 173-303-320, other inspections are also required. Note, inspections, record keeping, and reporting are also governed by Hanford Facility Permit general conditions I.E, I.H, II.H, II.I, and II.O.

For the inspection requirements specific to container storage, you propose to conduct visual inspections using remote cameras during normal container handling activities and to use administrative procedures to record abnormal conditions. As Ecology understand's them, normal container handling activities are adding containers to the storage area, removing containers from the storage area, and moving containers within the storage area. We do not know the details of the administrative procedures you would use to record inspections.

As justification for this approach, you ask Ecology to consider the robust nature of your proposed container design and container storage area design. While Ecology agrees that the designs of your containers and container storage areas are much more robust than those for typical dangerous waste containers and storage areas (e.g., 55-gallon drums in conventionally designed structures) and we understand the need to accommodate remote inspection techniques because of the radioactive hazards associated with immobilized glass waste, Ecology will not waive the inspection requirement based on container and container storage area design and, unfortunately, we cannot assess the adequacy of your proposed approach to inspections unless you indicate when inspections will occur, how you will carry them out, and what you will look for.

At a minimum, you will be required to inspect the containers and container storage areas visually, using remote operated cameras or other means. Ecology understands and agrees that, given the facility- and waste-specific circumstances anticipated at the RPP – WTP, it may not be necessary to visually inspect every container each week; however, it is necessary to specify a frequency for inspection. To the extent normal container handling activities are used to satisfy the requirement for inspections, it is necessary to describe these activities and their frequency. For example, when moving a container into storage, will the operator inspect the entire storage area and each container for cracks or other deformities, or will only certain containers be evaluated? Perhaps you will inspect only the container being placed into storage or that container and those adjacent to it. How often will individual containers be inspected, that is, assuming that each container is, at a minimum, inspected when being placed into storage and when being removed from storage, how long will containers remain in the storage area? What will your operators evaluate during these inspections? What are the administrative procedures that will be used to record the inspections?

Based on your proposal, Ecology's understanding of anticipated facility design and operation, and the dangerous waste regulations, at this time, we anticipate that permit conditions for container and container storage area inspection will, at a minimum, require the following:

13. Visually inspect, by remote camera or other specified means, each container when it is placed into storage, removed from storage, and moved during storage. During visual inspection, at a minimum: look for any leaks or other cracks or deformities in the container and for any cracks or deformities and the presence of any liquid or other foreign material in the area around the container (i.e., the floor and walls if container located next to a wall); verify unique container identifier; and, for containers removed from storage or moved during storage, verify that the container was found in the specific storage position where the tracking system indicated it would be located. So Ecology can consider your plans in this area, in your permit application, please specify the inspection activities you expect operators to perform during normal container handling and the frequency of container handling (i.e., inspection).

14. Visually inspect, by remote camera or other specified means, the entire container storage area and each container being stored. During visual inspection, at a minimum: look for any leaks or other cracks or deformities in containers and for any cracks or deformities and the presence of any liquid or other foreign material in the container storage area; and, verify that containers are located in the specific storage position where the tracking system indicated they should be located. Of course, depending on your plans for inspection during normal container handling and the frequency of normal container handling, this type of inspection may be required very infrequently or may not be required at all. See paragraph number 13, above.

15. Maintain the visual inspection system (e.g., if remote cameras are to be used, maintain the remote cameras). Ecology anticipates this condition will include requirements to have all equipment necessary to carry out visual inspections available at the facility at all times and to maintain all elements of the visual inspection system including, for example, camera equipment, lighting to ensure that cameras can accurately record the conditions of containers, container storage areas, and unique container identifiers, camera deployment equipment, and any associated video or other monitoring equipment. So Ecology can consider your plans in this area, in your permit application, please specify the equipment you plan to use for visual inspections and the procedures you plan to use to maintain the equipment.

16. Keep a log of all inspections including, at least, the date and time of the inspection, the printed name and the handwritten signature of the inspector, a notation of the observations made, and the date and nature of any repairs or remedial actions taken. Retain the inspection log at the facility for at least five (5) years from the date of inspection. Ecology anticipates that this condition will specify the location of the inspection log at the facility so that the log is readily available to facility personnel, Ecology inspectors, and emergency responders. So Ecology may consider your plans when developing the details of this condition, please indicate how you intend to log inspections and where you intend to keep the inspection log.

Thank you again for your continued attention to these important issues. Ecology looks forward to continuing to work with you and the rest of the Hanford community as you develop your permit application. I understand that our ability to make timely dangerous/hazardous waste permitting decisions is critical to achievement of a tank waste treatment facility, if you have any questions or if I can be of

further assistance, please feel free to contact me at (509) 736-5705. You may also direct questions to Elizabeth McManus, who is coordinating Ecology's review of your permit application. She can be reached at (360) 407-6524.

Sincerely,

Suzanne Dahl, Tank Waste Disposal Project Manager
Nuclear Waste Program

SD:EM:sb
Enclosure

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