Yankee Atomic Electric Company  
19 Midstate Drive, Suite 200  
Auburn, MA 01501  

Attention: James A. Kay, Principal Licensing Engineer  

RE: Rowe-DSWM-04-253-009  
MADEP Solid Waste Permitting  
Beneficial Use Determination (BUD) Permit  
SCFA Soils as Fill  
Yankee Nuclear Power Station  
49 Yankee Road  
BWPSW013  
Transmittal #W052767  

BUD Permit Approval - Provisional  

Dear Mr. Kay:  

On July 29, 2004 the Solid Waste section of the Massachusetts Department of Environmental Protection (the Department) received a Beneficial Use Determination (BUD) permit application for the beneficial reuse of soils to be excavated from the Southeast Construction Fill Area (the SCFA) of the Yankee Nuclear Power Station (YNPS) in Rowe, MA. At the request of the Department, a revised BUD permit application was submitted on November 9, 2004, containing the results of additional sampling performed on the subject soils. The original and revised BUD permit applications were prepared on behalf of Yankee Atomic Electric Company (Yankee) by Yankee’s consultant, Environmental Resources Management (ERM) of Boston, MA, and the applications were signed by Frank Helin, Decommissioning Director for Yankee. The Department had previously issued to Yankee the permit approvals of the Solid Waste Comprehensive Site Assessment (CSA) and Corrective Action Alternatives Analysis (CAAA) reports for the SCFA. On July 29, 2004, the Department also received the Solid Waste Corrective Action Design (CAD) Plan and permit application for remediation of the SCFA.  

The YNPS plant is in the process of decommissioning, in accordance with Nuclear Regulatory Commission (NRC) regulations 10 CFR Part 50. As a part of decommissioning activities, the SCFA has been assessed and will be closed in accordance with the Department’s Solid Waste regulations at 310 CMR 19.000. The CAD plans for the SCFA have been developed as part of the overall decommissioning strategy of the YNPS. The SCFA is a fill area of approximately 1.2 acres in size, located immediately southeast of the Yankee facility (within Yankee property), where debris from construction activities at the site was
historically placed. All radiological issues associated with decommissioning of the YNPS fall under the authority of the Massachusetts Department of Public Health’s Radiation Control Program (the MA DPH), the NRC, the United States Environmental Protection Agency (the EPA), and the Department, as applicable. It is the Department’s understanding, according to Yankee and the MA DPH, that radiological monitoring of the SCFA, the stream and the surrounding area has shown results that are consistent with natural background levels (i.e., reportedly there has been no significant evidence at the SCFA of any facility-related radionuclides or radioactivity).

**SCFA Soil Sampling - Results**

Twelve soil samples were collected during a test-pitting and debris removal program within a portion of the SCFA (Area H) in 1998, and analyzed for:

- volatile organic compounds (VOCs) by EPA Method 8260;
- RCRA 8 metals; and
- The 33 radionuclides of concern as identified in the License Termination Plan (LTP) for the YNPS, by gamma-ray spectroscopy.

On July 13, 2000, Yankee received written approval from the Department to stockpile approximately 10,000 cubic yards of soil on the top of the SCFA, which was excavated to prepare a properly-engineered sub-base for the Interim Spent Fuel Storage Installation (ISFSI) area at the Facility. This soil was sampled and analyzed in accordance with the Department’s approval letter, for:

- VOCs by EPA Method 8260;
- Semivolatile organic compounds (SVOCs) by EPA Method 8270;
- RCRA 8 metals;
- Extractable and Volatile Petroleum Hydrocarbons (EPH/VPH) by the Department’s Office of Research & Standards (ORS) Method;
- Polychlorinated Biphenyls (PCBs) by EPA Method 8082; and
- radionuclides.

The ISFSI soil is referred to in the BUD report as the “recent fill” of the SCFA, versus the “historic fill” of the SCFA, present beneath the ISFS soil stockpile.

The Department’s CAAA approval for the SCFA required that one soil sample be collected and analyzed for every 1,000 cubic yards of soil in the SCFA. As required, ERM (on behalf of Yankee) completed thirty soil borings in August, 2004 within and adjacent to the SCFA, in the historic fill, to total depths ranging from 5 feet to 38 feet. ERM screened split-spoon soil samples from each boring with a Flame Ionization Detector (FID) for the presence of VOCs, and collected a minimum of one soil sample from each boring (at either the highest FID reading or by visual or olfactory evidence) for analysis of the following parameters:

- VOCs by EPA Method 8260;
- RCRA 8 metals;
- EPH by the Department’s ORS Method;
- PCBs by EPA Method 8082; and
- The 33 radionuclides of concern as identified in the License Termination Plan (LTP) for the YNPS.

The following are the results of **non-radiological** analyses for soil samples from the SCFA:

- VOCs were non-detectable (ND) in all samples, with the following exceptions:
  - 230 micrograms/kilogram (µg/kg, or parts-per-billion) of tetrachloroethylene in Test-Pit SEC-5 in 1998;
  - Acetone in boring SCFA-14 at 90 µg/kg and in boring SCFA-26 at 54 µg/kg;
  - 2-Butanone (MEK) in four borings, up to 17 µg/kg;
Carbon disulfide at 6 ug/kg in boring SCFA-10;
Diethyl ether in six borings, up to 79 ug/kg;
Toluene in seven borings, up to 18 ug/kg.

- All metal levels were beneath the Department’s Bureau of Waste Site Cleanup (BWSC) S-2/GW-1 soil standards, except for two soil samples from the 1998 test-pitting program which exceeded the 100 mg/kg S-2/GW-1 standard for lead (SEC-2 at 280 mg/kg, and SEC-5 at 130 mg/kg). The majority of the soil samples were also within the ranges of natural background soil concentrations established by BWSC;
- EPH was detectable in nine borings, up to 588 milligrams/kilogram (mg/kg, or parts-per-million); and
- PCBs were detectable in eight borings, up to 12 milligrams/kilogram (mg/kg, or parts-per-million);

The following are the results of radiological analyses for soil samples from the SCFA:
- The 1998 analyses showed that the soils displayed either non-detectable or apparent natural background levels of radionuclides, except for very low levels of Cobalt-60 detected in three soil samples, up to 0.3 picocuries/gram (pCi/g). This soil was reportedly associated with some waste asphalt in Area H of the SCFA (15 cubic yards of waste asphalt was removed from the SCFA in 1998);
- The 2004 analyses again showed that the soils displayed either non-detectable or apparent background levels of radionuclides.

The details of the radiological soil sampling activities for the SCFA are outlined in the Historic Site Assessment (HSA) of the License Termination Plan (LTP), Volume II, OOL-09.

The soil borings revealed that the historic fill of the SCFA consists primarily of soil, with some amounts of wood (including burnt wood), with a maximum historic fill thickness of 25 feet. FID screening during installation of the soil borings showed headspace readings up to 1,690 ppm, which ERM attributes to methane generation within the SCFA, apparently from the wood debris. The “recent” ISFSI fill located on a portion of the top of the SCFA has a maximum thickness of 15 feet.

Proposed BUD

On April 13, 2004 the Department issued to Yankee its approval of the CAAA remedial feasibility study for the SCFA, which conceptually approved of Yankee’s proposal to excavate, segregate and remove the SCFA to achieve final closure of the SCFA under the Massachusetts Solid Waste regulations. The material which is proposed to be beneficially utilized according to this subject BUD permit is the soil to be excavated during the proposed remediation of the SCFA, which is proposed to be reused on-site as fill, in the industrial portion of the YNPS. The CAD for the SCFA proposes to: excavate the entire volume of the SCFA; perform additional non-radiological and radiological screening of soil during the excavation; segregate out any solid wastes or unacceptable soil for proper off-site disposal; and to use remaining “clean” soils from the SCFA to fill foundation holes and provide grading and cover material for the closure of the “Facility” portion of the YNPS. The “Facility” portion of the YNPS is defined as the former industrial area where facility structures were located.

Yankee proposes to utilize the excavated SCFA soil to:
- fill in and around foundation holes in the Facility area; and
- install a 3-foot thick layer of soil over the Facility area, where the remaining concrete subsurface structures are located.

As directed by the Department, ERM followed the procedures outlined in the Department’s Draft Interim
Guidance Document for Beneficial Use Determination Regulation ("the Draft BUD Guidance") for assessing whether the soils from the SCFA are suitable for use as fill in the BUD (for non-radiological parameters), including the performance of a BUD Risk Assessment. ERM states that Yankee will establish an Activity and Use Limitation (AUL) for the Facility area where the BUD soils will be used as fill, and that therefore the use of the soils is a Category 3 (Beneficial use in a Restricted Application) BUD, according to the Draft BUD Guidance. In the Facility BUD area, ERM states that the applicable Department Bureau of Waste Site Cleanup (BWSC) soil classifications are S-2 and S-3 (low-frequency, low intensity use by adults and children in the long-term), and the applicable BWSC groundwater classification is either GW-1 or GW-3. Therefore, ERM compared the average concentrations of detected non-radiological Contaminants of Concern (COCs) in the soil samples from the SCFA to the standards contained in the following tables of the Draft BUD Guidance: S-2/GW-1; S-2/GW-3; S-3/GW-1; and S-3/GW-3.

ERM states that all of the average COC concentrations in the SCFA soil samples are below the above-described standards in the Draft BUD Guidance. However, in order to also satisfy USEPA TSCA requirements, Yankee is, in addition, completing the following regarding PCBs in the SCFA soils:

- Additional soil borings and sampling are being completed adjacent to the eight borings where PCBs were detected in 2004, with the number of additional samples designed to meet the 90% upper confidence limit of the mean (ULCM), in excess of the 80% ULCM requirement in the Draft BUD Guidance; and
- Following the additional sampling and analysis; soils excavated from the SCFA will be segregated so that any soils with greater than the TSCA limit will be sent off-site for proper disposal, and only soils with PCB levels less than 1 mg/kg will be reused onsite as part of the BUD.

Note – as outlined in Condition 6 of this permit, Yankee must follow all USEPA TSCA requirements for the sampling and disposition of soils (and other materials) containing PCBs. Should Yankee develop and permit onsite treatment capabilities, soils that are processed may be utilized on site in accordance with this BUD permit, USEPA TSCA requirements, and any permits or approvals required for such on-site treatment.

For radiological parameters, ERM states that all sampling of the SCFA soils have displayed either nondetectable or apparent natural background levels of radionuclides, except for the very low levels of Cobalt-60 detected in the three soil samples associated with waste asphalt in Area H, as described above. ERM states that the soils and associated asphalt in Area H will be screened for radiological constituents and this asphalt/soil material (and presumably any other material in the SCFA above background) will be handled in the following manner:

- If the asphalt/soil is determined to be below the 25 millirem/year DCGLs contained in the LTP, Yankee proposes to utilize this material as fill in accordance with a separate Concrete Rubble/Subsurface Structure BUD submitted to the Department for the Facility area;
- If the asphalt/soil is determined to be above the 25 millirem/year DCGLs contained in the LTP, such asphalt/soil will be removed off-site for proper disposal as radioactive waste.

Note – as outlined in Condition 4 of this permit, Yankee must submit additional radiological analyses and information for the SCFA soil, and as outlined at Condition 7 of this permit, the only SCFA soil which may be used in the BUD is soil which displays background levels of radioactivity. The Department does not approve the proposal by ERM and Yankee to utilize asphalt/soil from Area H (or from anywhere within the SCFA) at levels up to the 25 millirem/year DCGLs contained in the LTP, as fill in this BUD. The use of soil from site areas other than the SCFA will be performed according to other regulatory requirements, as applicable.
DEPARTMENT DETERMINATIONS

The Department has reviewed the proposed BUD permit application to utilize the subject soil excavated during the proposed remediation of the SCFA, which is proposed to be reused on-site as fill, in the industrial Facility area of the YNPS, in accordance with the Massachusetts Solid Waste Regulations 310 CMR 16.00 & 19.000. At the Department’s request, the MADPH reviewed the radiological data associated with the permit application, in accordance with MADPH regulations, policies and guidance. The Department approves the referenced BUD permit in accordance with the regulations for Beneficial Use of Solid Wastes at 310 CR 19.060, subject to the following conditions and requirements.

1. The Department is issuing this permit as a provisional permit in order to satisfy the requirement at 310 CMR 19.060(3) that the Department shall accept comments from the Rowe Board of Health regarding the BUD permit application. As outlined at 310 CMR 19.037(4)(a), the Department is deferring the effective date of this BUD permit for a period of 21 days, for the purpose of obtaining comments from the Rowe Board of Health prior to a final decision.

2. This permit is only for the use of the subject soil excavated during the proposed remediation of the SCFA (“the SCFA soil”), to be reused on-site as fill, in the designated portion of the industrial Facility area of the YNPS. This permit does not allow the reuse of the SCFA soil in any other location within the Commonwealth of Massachusetts (the Department has no authority outside the Commonwealth). This permit also does not address the separate Concrete Rubble/Subsurface Structure BUD submitted to the Department for the Facility area.

3. The reuse of the SCFA soil shall be confined to the proposed BUD area outlined on Figure 3 of the application. The historic SCFA soil shall only be utilized as fill and grading material in the lower 2 feet of the 3-foot soil cap layer, or in the fill beneath this layer, but shall not be utilized in the top 1 foot of the 3-foot soil cap layer. The top 1 foot of the 3-foot soil cap layer shall consist of 6 inches of clean fill (which may include the ISFSI soil), overlain by 6 inches of clean topsoil, seeded with grass.

4. The remaining soil sampling of the SCFA (to reach the 90% ULCM as proposed) shall be completed, and the results (soil boring logs and all analytical data) shall be submitted to the Department (all data), the MADPH (radiological data only), and the USEPA (PCB data only) for review prior to the start of excavation of the SCFA. In addition, the following additional radiological information shall be submitted to the Department and the MADPH for review prior to the finalization of the SCFA soil BUD:
   A. A description of the methodology used to quantify Radionuclides of Concern (ROCs), such as C-14 and H-3, that could not be measured directly by gamma ray spectroscopy;
   B. A description of the methodology and equipment to be used (including minimum, detectable activities, or MDAs) for radiological screening of soil, asphalt and other materials which may be encountered during excavation of the SCFA; and
   C. A sufficient number of additional soil samples, including samples in Area H, shall be analyzed for ROCs to ensure that the 90% ULCM is attained for ROCs as well as PCBs.

The Department reserves the right to restrict, modify or rescind this BUD permit approval, based on its review of the results of the additional data required above, including soil sampling and analysis.
5. **Non-radiological soil analyses:** The Department has determined that the applicable BWSC soil and groundwater classifications for the proposed BUD use area are S-2/GW-1. The Department agrees with ERM's conclusion that the SCFA soil analyses submitted to date meet the standards for non-radiological parameters (oil or hazardous material) as outlined in the S-2/GW-1 table of the Draft BUD, except for samples SEC-2 and SEC-5 (this lead-impacted soil was removed as a Limited Removal Action, or LRA, in 1998). As proposed, excavated soils shall be visually inspected and screened (as appropriate) with a photoionization detector (PID) for the presence of VOCs, and contaminated soil shall be segregated for further evaluation and off-site disposal, as needed. The Department requires that all SCFA soil to be used as part of this BUD shall meet the standards for non-radiological parameters (oil or hazardous material) as outlined in the S-2/GW-1 table of the Draft BUD Guidance. All soil exceeding these standards shall be segregated and properly disposed of off-site at permitted disposal facilities or, alternatively, utilized on-site in accordance with this BUD permit, USEPA TSCA requirements, and any permits or approvals required for such on-site treatment, should Yankee develop and receive appropriate permits for such on-site treatment technology.

6. **Non-radiological soil analyses:** In addition to the requirements outlined at Conditions 4 & 5, Yankee shall comply with all applicable USEPA Toxic Substances Control Act (TSCA) regulations and requirements concerning the presence of PCBs in the SCFA soil.

7. **Radiological soil analyses:** The MADPH reviewed the radiological analyses of the SCFA soil samples and concurs with ERM and Yankee's conclusion that the bulk of the SCFA soil may be used as fill in the BUD, as it displays only background levels of radioactivity. As required by both the MADPH and the Department, the only SCFA soil which may be used in the BUD is soil which displays background levels of radioactivity. The Department denies the proposal by ERM and Yankee to utilize asphalt/soil from Area H (or from anywhere within the SCFA) at levels up to the 25 milliCi/year DCGLs contained in the LTP, as fill in this (or any other) BUD. During excavation of the SCFA, Yankee shall perform radiological screening of the excavation and the excavated soil (in accordance with all appropriate NRC and MADPH requirements, policies or guidelines), to determine whether the SCFA soil contains levels of radioactivity above background. Yankee shall comply with the MADPH letter to Yankee dated December 17, 2004, regarding the use of material as fill on-site (including soil), which is above background for radioactivity.

8. As proposed, solid wastes shall not be used as fill in this BUD. All solid wastes encountered in the excavation of the SCFA shall be segregated and disposed of properly off-site at permitted solid waste and/or radioactive waste disposal facilities (as appropriate). Asphalt, brick and concrete (ABC) debris from the SCFA may be utilized in the BUD fill area, as long as it meets the requirements of Conditions 1 through 7 above, and as long as the ABC debris does not exceed 2 feet in diameter.

9. **Deed Notification/Activity and Use Limitation:** A notification shall be placed on the deed for the YNPS property, consistent with the Department's Solid Waste regulations at 310 CMR 19.141, relative to the SCFA soil BUD permit area. The deed notification shall specifically contain the following:

A. Identification of record owners of the property;
B. A description of the BUD site, by metes and bounds and by reference to an appropriate map or plan to be recorded therewith, signed by a qualified professional engineer or a land surveyor, depicting the boundaries of the SCFA soil BUD fill area and the location of any and all groundwater monitoring wells within and adjacent to this BUD area;

C. A detailed description of the type and extent of the soil cover on the BUD area;

D. A description of the nature and duration of post-closure maintenance and monitoring requirements for the BUD area;

E. Reference to the Department file number (Solid Waste File #253-009) for identifying the SCFA soil BUD file; and

F. The deed notification shall contain the following statement “The premises described herein are subject to the provision of MGL c. 111, sec. 150A and 310 CMR 19.000. Said premises shall not be used for any purpose other than as a closed BUD fill area without prior written approval of the Massachusetts Department of Environmental Protection. Continued operation of the site as a BUD fill area requires the transfer of the permit in accordance with 310 CMR 19.044. The procedure for Department approval for any use other than as a closed BUD fill area is set forth at 310 CMR 19.143. Such Department approval of other use is transferable or assignable only upon written approval of the Department.”.

Within 90 days of completion of the BUD permit fill activity, Yankee shall submit to the Department: documentation that the deed notification was completed as required above and recorded at the Franklin County Registry of Deeds; and documentation that all solid waste and/or radioactive material above background, segregated from the SCFA, has been properly disposed of off-site at permitted facilities. The post-closure requirements at 310 CMR 19.143 apply to the BUD area, including the requirement that there be no disturbance of the 3-foot soil layer, excavation of the BUD area, or any other invasive procedures in the BUD area (i.e soil borings, well installation, etc.) without prior written approval from the Department. Post-closure maintenance shall be performed for the BUD fill area, as outlined at 310 CMR 19.142, including maintenance of the soil layer and grass cover. Any erosion of the soil cover layer shall be immediately repaired. The BUD fill area shall be maintained in accordance with the “Post-Decommissioning Grading Plan and Stormwater Management Analysis” and the “Post-Decommissioning Planting Plan and Specifications” dated August 2004 or as subsequently updated (and approved by the Department).

10. Yankee shall also comply with the requirements of the separate Department permit approval of the Corrective Action Design (CAD) Plan for the excavation of the SCFA.

11. The material in the BUD fill area, including the SCFA soil, must be included in the site-wide Risk Assessment (for both non-radiological and radiological parameters) to be completed as part of the site-wide BWSC Phase II Equivalent Report.

12. Yankee is responsible for obtaining (and complying with) any other local, state or federal permits which may be necessary for utilization of the SCFA soil in the BUD permit, including any permits required by the USEPA, NRC, MADPH, or the Rowe Conservation Commission, as appropriate.

13. The Department reserves the right to modify or rescind this approval at any time, should the conditions of this approval not be met, should nuisance conditions be created, or should the Department otherwise determine that the usage of the SCFA soil poses a threat to public
health, safety or the environment.

14. The Department and its agents and employees shall have the right to enter upon the site at reasonable times and with reasonable notice, to inspect the BUD fill area and to otherwise monitor compliance with this Permit and other Department environmental laws and regulations. This right of entry and inspection shall be in addition to the Department’s access authorities and rights under applicable federal and states laws and regulations, as well as any permits or other agreements between the Permittee and the Department.

Pursuant to 310 CMR 19.037(5), any person aggrieved by the issuance of this decision, except as provided for under 310 CMR 19.037(4)(b), may file an appeal for judicial review of said decision in accordance with the provisions of M.G.L. c. 111, s. 150A and C. 30A not later than thirty (30) days following notice of this decision. Any aggrieved person intending to appeal the decision to the superior court shall provide notice to the Department of said intention to commence such action. Said Notice of Intention shall include the Department File Number (04-253-009) and shall identify with particularity the issues and reason(s) why it is believed the approval decision was not proper. Such notice shall be provided to the Office of General Counsel of the Department and the Regional Director for the regional office which made the decision.

The appropriate addresses to which to send such notices are:

General Counsel  
Department of Environmental Protection  
One Winter Street  
Boston, 02108

&

Regional Director  
Department of Environmental Protection  
436 Dwight Street - 5th Floor  
Springfield, MA 01103

No allegation shall be made in any judicial appeal of this decision unless the matter complained of was raised at the appropriate point in the administrative review procedures established in those regulations, provided that matter may be raised upon a showing that it is material and that it was not reasonably possible with due diligence to have been raised during such procedures or that matter sought to be raised is of critical importance to the public health or environmental impact of the permitted activity.

This Determination pertains only to the solid waste management aspect of the proposal and does not negate the responsibility of the owners or operators to comply with any other applicable state, local, or federal laws or regulations now or in the future.

The Department has determined that the filing of an Environmental Notification Form ("ENF") with the Secretary of Environmental Affairs, for solid waste management purposes, was not required prior to this action by the Department. Notwithstanding this determination, the Massachusetts Environmental Policy Act and Regulation 301 CMR 11.00, Section 11.04 provide certain "Fail-Safe Provisions" which allow the Secretary to require the filing of an ENF and/or
Environmental Impact Report at a later time.

If you have any questions concerning this matter, please contact Larry Hanson of this office, at #413-755-2287.

Sincerely,

Daniel Hall
Section Chief
Solid Waste Management

DH/LGH/lgh
Word:yanksoilsbud1204

cc: Yankee Atomic - Kenneth Dow
Rowe Board of Health
Rowe Conservation Commission
ERM, Inc. – John McTigue, LSP
MA DPH – Radiation Control Program – Michael Whalen
USEPA, Region 1 – Marvin Rosenstein, Kimberly Tisa
NRC – John Hickman
DEP/WERO – David Howland, Michael Gorski
DEP/Boston/BWP – Paul Emond