DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
2000 NAVY PENTAGON
WASHINGTON, DC 20350-2000

IN REPLY REFER TO

6470
Ser N456S/7U158308
22 October 2007

G-7
45-23645-01NA
03029462

U. S. Nuclear Regulatory Commission
Region I
Attn: Ms O. Masnyk-Bailey
475 Allendale Road
King of Prussia, PA 19406-1415

SUBJECT: BUILDING 150 AND UNDERGROUND STORAGE TANK DECOMMISSIONING PROJECT, NATIONAL NAVAL MEDICAL CENTER, BETHESDA MD

Ms. Masnyk-Bailey:

The former Naval Medical Research Center (NMRC), Bethesda, Maryland was authorized to possess and use licensed radioactive materials under Naval Radioactive Materials Permit (NRMP) No. 19-32398-41NP in accordance with the NRC Master Materials License Number 45-23645-01NA. The Navy's letter of November 29, 1999 submitted a decommissioning plan (DP) for NMRC. The NRC, Region II response of February 29, 2000 recommended the Navy separate the decommissioning activities for Building 150 from the rest of NMRC decommissioning activities and perform a characterization survey of Building 150. The Navy agreed and commenced decommissioning activities at NMRC. During planning for the characterization survey, the Navy discovered two underground storage tanks (USTs), located near Building 17B, which NMRC used as holding tanks for the discharge of radioactive liquids. The USTs were added to the Building 150 decommissioning project as reported by our letter of July 5, 2005. Your emails of February 7, 2007 and February 12, 2007 and letter of March 30, 2007 requested additional information concerning the source of contamination in the USTs and their drain connections, a physical description of Building 150, and additional information on the drain lines exiting Building 150.

NAVSEADET RASO conducted a review of NMRC historical information, the AEC license file at the National Archives, and public work drawings. Questions and answers concerning the USTs and the drain lines outside of Building 150 are provided in enclosure (1). A current physical description of Building 150 is provided in enclosure (2).

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NMSS/RGN1 MATERIALS-002
REF. 137386

The NMRC DP submitted in 1999 contains an index of historical documentation concerning decommissioning of Building 150 that is extensive and contains a large amount of detail. Unfortunately, there is no comprehensive report for decommissioning of Building 150 in 1963. The historical documentation does not describe removing the drain lines. A brief historical summary of Building 150 decommissioning activities is provided below to supplement the history in the decommissioning report forwarded by our letter of July 5, 2005:

> Building 150 was designed and built in 1951 to irradiate animals and operated until 1962. In 1957, the Atomic Energy Commission issued Byproduct Material License No. 19-02891-3 to Naval Medical Research Institute (NMRI) approving the operation of Building 150 for irradiation of animals. The license expired on March 31, 1963. The investigation of Building 150 following discovery of contamination of HM2 W. Ross in April 1962 also showed widespread contamination on the ground surrounding the building. The cause of the incident was determined to be failure of source capsule seals. Building 150 was decommissioned in early 1963. To prepare for decommissioning, a fenced exclusion area surrounding Building 150 was cleared of trees and vegetation. An access road was built leading up to the rear of Building 150 to allow access by a contractor vehicle carrying shielded containers for transport of the cobalt-60 sources. From March 21 through March 30, 1963, Atlantic Research Corporation removed the cobalt-60 sources in accordance with their AEC License No. 45-2808-02 and transferred them to Oak Ridge National Laboratory. An area adjacent to Building 150 was regraded to allow level loading of the contractor vehicle. NMRI filed a Certificate of Disposition of Radioactive Materials on April 12, 1963. Following removal of the sources, Navy personnel removed building internals, the roof, and ventilation equipment for disposal as radioactive waste. During the removal of the roof, the top of the building and the ventilation equipment were wetted down to control dust. On 3 May 1963, 15 packages of radioactive waste were transported to the U.S. Army, Edgewood MD for disposal at an AEC licensed burial site. From 31 May to 13 June 1963, Navy personnel also removed approximately 4 to 6 inches of soil adjacent to Building 150 and packaged it as radioactive waste for subsequent disposal. Bulldozers were used to move debris and soil through out the decommissioning. All debris was

surveyed. Uncontaminated debris was disposed of in the NNMC dump.

The Navy presumes that drain lines outside Building 150 were connected to the sanitary sewer system (see enclosure (1)) and were removed during the 1963 decommissioning. As documented in the Building 150 and Underground Storage Tank Decommissioning project report, NWT removed the drains and drain lines because of residual contamination detected in the floor drains inside the building. The sediment from inside two drains contained residual cobalt-60 concentrations of 35 and 70 pCi/g. NWT could not fit detector probes inside the drain lines to measure residual contamination along the entire drain line length and consequently removed the drain lines to 20 feet outside the building for disposal as radioactive waste. The Navy notes that the residual concentrations found by NWT are approximately equal to the screening value for cobalt-60 of 38 pCi/g and are far less than the exempt concentration of 500 pCi/g specified in 10 CFR 30.70, Schedule A. The Navy believes that any current radioactivity from the original incident is less than the concentration found in the drains and that after nearly 45 years (8 half-lives of cobalt-60), water flow through the sanitary sewer has removed and further diluted any original contamination and carried it to the Blue Plains treatment plant. The Navy feels further investigation is not warranted.

If you have any further question regarding this action, please contact Mr. William Morris or Dr. Steve Doremus at NAVSEADET RASO: (757) 887-4692, or william.j.morris2@navy.mil or steve.doremus@navy.mil.

Sincerely,

L. L FRAGOSO
By direction

Enclosure: (1) Nuclear Regulatory Commission Questions and Navy Answers, Naval Medical Research Center, Bethesda MD
(2) Building 150 Physical Description

Copy to:
COMNAVSEASYSCOM (04N)
NAVSEADET RASO
NNMC, Bethesda (5400); NEHC

Nuclear Regulatory Commission Questions
and Navy Answers
Naval Medical Research Center (NMRC), Bethesda, MD

NRC Comment: The two underground storage tanks (USTs) were contaminated with tritium. NRC asks:

NRC Question: How did NMRC use the USTs?

Navy Response:
NMRC installed the USTs in 1977 and used them until January 1988 to hold radioactive liquids for discharge to the sanitary sewer.

NRC Question: What was the original source of contamination in the USTs?

Navy Response:
Radioactive liquids from NMRC's biomedical research laboratories were placed in the tank through above ground stand pipes connected to the USTs. The Navy submitted a Decommissioning Plan (DP) for NMRC facilities in a letter dated November 29, 1999. The DP provides the history of radioactive material use that is the source of contamination in the USTs. Carbon-14 and tritium were the only long lived radionuclides used by NMRC.

NRC Question: Was there another decommissioning action for the original source(s)?

Navy Response:
Yes. The Navy submitted a Decommissioning Plan (DP) for NMRC facilities in a letter dated November 29, 1999. NMRC completed decommissioning of their facilities (excluding Building 150 and the USTs) in accordance with that DP in 2002.

NRC Question: Where were the tanks located (including depth) and what were there sizes?

Navy Response:
The USTs were installed adjacent to Building 17B. NMRC biomedical research laboratories, where unsealed radioactive material was used, were located in nearby buildings. The tops of the tanks were located approximately 2 feet below ground surface. Both USTs were 5.5 feet in diameter and 6 feet long. The location relative to Building 17B and UST sizes were

provided in the NWT report submitted by NRSC letter of 5 July 2005.

NRC Question: Where did the drain lines from the tanks terminate?

Navy Response: A May 1980 public works drawing titled "Chilled Water Distribution for Building 17B" shows a 4 inch sanitary sewer line running from the USTs to the east end of Building 155 and connecting to a sanitary sewer line exiting from Building 155. The sanitary sewer lines connect to the Washington Suburban Sanitary Commission (WSSC) sewer system, which empties at the Blue Plains Wastewater Treatment Plant in the District of Columbia.

NRC Question: Where were the tanks shipped (provide shipping documents) and disposed?

Navy Response:
The tanks were shipped to US Ecology, Robstown, Texas. Shipping documents are provided in Appendix T of the NWT decommissioning report submitted with the NRSC letter of 5 July 2005.

NRC Comment Building 150 drain lines ended about 20 feet from the building. Earlier drain line removal past 20 feet was evident. NRC asks:

NRC Question: When was the piping removed and why did it happen?

Navy Response: The Navy believes the drain lines were removed during decommissioning of Building 150 in 1963. Historical documentation does not describe why the drain lines were removed.

NRC Question: Is there documentation?

Navy Response: There is no documentation that describes removal of the drain lines. A memorandum (radioactive waste package monitoring record) lists two packages containing pipes. A memorandum from the NNMC, RSO to Edgewood Arsenal contains an inventory of radioactive waste packages and lists pipes among the contents of the packages. The memoranda were dated May 3 and May 7, 1963 respectively. The Navy believes these memoranda refer to the drain lines. The packages were ultimately buried at an AEC licensed burial ground.

NRC Question: Were the removal of drainlines outside Building 150 part of another remediation action?

Navy Response:
The Navy believes the drain lines were removed during decommissioning of Building 150 in 1963.

NRC Question: Where did the drain lines terminate? (e.g., septic tank, public sewer)?

Navy Response:

Public Works drawings that show the locations of drains inside of or drain lines exiting Building 150 can not be located. A 1954 Public Works drawing shows a Navy sewer line directly east of the building that connects to a downgrade sanitary sewer manhole southeast of the building. A 1989 drawing shows a sanitary sewer manhole, Manhole 047M, south (downgrade) of Building 150 and notes that the Navy sewer line directly east of Building 150 no longer exists. The sewer manhole and the sewer line east of Building 150 are the nearest logical connection points for drain lines exiting Building 150. The Navy presumes that the drain lines were connected to the sanitary sewer system since it was the policy of National Naval Medical Center to connect all drains to the sanitary sewer system. The manhole and the sewer line are operated by the WSSC.

NRC Question: Was there any sampling downstream?

Navy Response:
The Navy is not aware of any sampling in 1963. The Navy contractor, NWT, tried but could not locate Manhole 047M.

NRC Question: How do we know that the end of the line isn't contaminated?

Navy Response:
The sewer line carries a large fraction of waste water from the upper Wisconsin Avenue corridor as well as waste water discharged by NNMC (800,000 gallons per day) to the Blue Plain Wastewater Treatment Plant. The water flowing through this sewer line for nearly 45 years (8 half-lives of cobalt-60) would likely have dispersed any contamination that reached the sewer man hole before removal of the drain lines.

BUILDING 150 FACILITY DESCRIPTION

Building 150 is an 1100 square foot reinforced concrete building that was divided into two radiation exposure rooms and a control room. The building is constructed of reinforced concrete one foot thick. It is covered with an overhead reinforced concrete slab of concrete 10 inches thick. The control room is separated from the two radiation rooms by a massive radiation shield 3 feet 10 inches thick, constructed of reinforced barite concrete which is 45 pounds heavier per cubic foot than ordinary concrete. The radiation shield between rooms 1 and 2 consisted of a loose fill of barite and scrap iron. A 3-foot barite concrete shield, in addition to the ordinary reinforced concrete building walls further protected radiation room 1, in which the cobalt capsules were stored.

Attachment (a) shows Building 150 and the fenced exclusion area surrounding it in early 1963 prior to remediation. The exclusion area was cleared and a dirt road was built to allow truck access the rear of Building 150. Attachment (b) shows the top of Building 150 and the surrounding area that is now overgrown with trees and brush.

Stoney Creek is located at the east and southeastern edge of the NMRC Bethesda site and runs within 150 to 200 feet of Building 150. The NMRC buildings are located at an elevation approximately 40 feet above Stoney Creek.

Attachment: (a) Building 150 (in foreground) circa March 1963
(b) Building 150 Rooftop, June 2007

Building 150 (in foreground) circa late March, 1963

Building 150 Rooftop, June 2003

This is to acknowledge the receipt of your letter/application dated

in February, and to inform you that the initial processing which includes an administrative review has been performed.

☑ NOTIFICATION 45-23645-01NA
There were no administrative omissions. Your application was assigned to a technical reviewer. Please note that the technical review may identify additional omissions or require additional information.

☐ Please provide to this office within 30 days of your receipt of this card

_____.

A copy of your action has been forwarded to our License Fee & Accounts Receivable Branch, who will contact you separately if there is a fee issue involved.

Your action has been assigned **Mail Control Number** 141253.
When calling to inquire about this action, please refer to this control number.
You may call us on (610) 337-5398, or 337-5260.

NRC FORM 532 (RI)
(6-96)

Sincerely,
Licensing Assistance Team Leader