



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

March 15, 2002

Docket No. 03005222

License No. 29-00139-02

John Mamone
Vice President Operations Support
E. R. Squibb & Sons, Inc.
Mail Stop W8T-1.12
311 Pennington-Rocky Hill Road
Pennington, NJ 08534-2130

SUBJECT: INSPECTION 03005222/2002001, E. R. SQUIBB & SONS, INC.,
NEW BRUNSWICK, NEW JERSEY SITE

Dear Mr. Mamone:

On January 9, 17 and February 20, 2002, Stephanie Tullio, Pamela Henderson, and Betsy Ullrich of this office conducted a safety inspection at the New Brunswick, New Jersey site of activities authorized by the above listed NRC license. The inspection was limited to a review of the characterization phase of decommissioning of your former manufacturing and distribution facility in Building 124 and surrounding areas. The findings of the inspection were discussed with Michael Vala and John Frankowski of your organization, Paul Ely of Duratek Inc. and Beverly Good of TLG Services at the conclusion of the inspection.

Within the scope of this inspection, no violations were identified.

In accordance with 10 CFR 2.790, a copy of this letter will be placed in the NRC Public Document Room and will be accessible from the NRC Web site at <http://www.nrc.gov/reading-rm.html>. No reply to this letter is required.

Your cooperation with us is appreciated.

Sincerely,

Original signed by John D. Kinneman

John D. Kinneman, Chief
Nuclear Materials Safety Branch 2
Division of Nuclear Materials Safety

cc:
Michael Vala, Radiation Safety Officer
Ed Truskowski, State of New Jersey, NJDEP
State of New Jersey

J. Mamone
E. R. Squibb & Sons, Inc.

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NAME	STullio /PJH for/		PHenderson /PJH/		EUllrich /BU/		JKinneman /JDK/	
DATE	3/6/02		3/6/02		3/6/02		3/15/2002	

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U.S. NUCLEAR REGULATORY COMMISSION
REGION I

INSPECTION REPORT

Inspection No. 03005222/2002001
Docket No. 03005222
License No. 29-00139-02
Licensee: E. R. Squibb & Sons, Inc.
Address: 311 Pennington-Rocky Hill Road
Mail Stop HW8T-1.12
Pennington, New Jersey 08534-2130
Locations Inspected: One Squibb Drive
New Brunswick, New Jersey
Inspection Dates: January 9, 17 and February 20, 2002

Inspectors: **/RA BY PAMELA J. HENDERSON FOR/** 3/6/02
Stephanie Tullio date
Health Physicist

/RA / 3/6/02
Elizabeth Ullrich date
Senior Health Physicist

/RA/ 3/6/02
Pamela J. Henderson date
Senior Health Physicist

Approved By: **/RA/** 3/15/2002
John D. Kinneman, Chief date
Nuclear Materials Safety Branch 2
Division of Nuclear Materials Safety

EXECUTIVE SUMMARY

E. R. Squibb & Sons, Inc.
NRC Inspection Report No. 03005222/2002001

The license authorizes the possession and use of various radionuclides in significant quantities. Manufacturing, processing and distribution activities permanently ceased on June 29, 2001. The distribution license (29-00139-04MD) was terminated on December 3, 2001. Subsequently, Squibb requested and was approved to reduce possession limits on their possession and use license, 29-00139-02. However, recent manufacturing operations were limited to approximately 5 isotopes: iodine-131, strontium-82, strontium-85, chromium-51 and cobalt-57. In addition to those isotopes, various isotopes had been used historically in manufacturing. These include: cobalt-60, cesium-137, carbon-14, strontium-90, molybdenum-99, iodine-123, iodine-125, gold-198, phosphorus 32, mercury-197, mercury-203, iridium-192, thallium-201, strontium-89 and selenium-75. There is also evidence that carbon-14 and tritium may have been used for research and development in laboratories in Building 124 in the 1960s. Although most of these isotopes have half-life of less than 65 days, there may have been long-lived impurities in the bulk solutions such as: technetium-99, manganese-54, cobalt-57, cobalt-60, cesium-137 and iodine-129.

This inspection report is limited to a review of E. R. Squibb & Sons, Inc.'s (Squibb) characterization phase of decommissioning of their former manufacturing and distribution facility in Building 124 and other nearby areas, including outdoor storage tanks, at the licensee's New Brunswick, New Jersey location of use. The inspection of the licensee's characterization surveys included three separate inspections on January 9 and 17, and February 20, 2002. The results of the licensee's characterization surveys will be used to support the decommissioning plan for Building 124, nearby areas and outdoor storage tanks. Building 124 contains 4 hot cells, laboratories, quality control facilities and a packaging area. Squibb has contracted with GTS Duratek, Inc. (Duratek) to develop and implement the site characterization. Squibb also contracted with TLG Services (TLG) to provide independent oversight of the activities of Duratek.

Region I also plans to perform inspections during the decontamination phase and during final status surveys. All inspections will include observation of the procedures, equipment, and methods used by the licensee; and confirmatory and independent measurements will be taken in order to determine if a post-final status survey is required.

Within the scope of this inspection, no violations were identified.

REPORT DETAILS

I. Background

Squibb performed characterization surveys to support the decommissioning of their former manufacturing facility and other nearby areas at Squibb's New Brunswick, New Jersey location of use. Based on historical records and knowledge, the areas to be characterized were divided into class 1 (expect contamination), class 2 (may find some isolated contamination), and class 3 (no radionuclides used here, do not expect contamination) areas. The class 1 areas include the Building 124 rooms 108, 109, 116, 118 (former decay tank area); 146-153 (southwest lab areas); 171-178, 180, and 181 (the cave areas); hot cells, the stack, tanks and tank valve pit, and the Building 83 wastewater tank pit. All Building 124 ventilation systems and process drain systems are also considered class 1 areas. Class 2 areas include Building 124 rooms 142-145, 154, 156-160, 162A, 163, 163B, 163C, 164, 165, 167, 168, 170 (south central lab areas), 179, 182-184, 190-213, 217 (north lab areas); Building 122 interior rooms 219-222; and regular drain systems. The class 3 areas are Building 124 north shipping areas, south office areas, the exterior and storm sewer drains, and land areas surrounding the Building, except the areas around the Building 124 and Building 83 tank vaults, where surface and deep soil samples were collected. Based on the results of the characterization surveys, areas requiring decommissioning will be identified and some areas may be reclassified prior to performing the final status surveys.

Scan surveys identified residual contamination in isolated spots of the class 1 and some class 2 areas. No areas of widespread contamination were yet identified, except on the interior of some of the hot cells. No ambient radiation levels were identified above background, except inside the former strontium-85 hot cell, where the radiation level was measured to be about 10 mrem/hour. Subsurface sampling was performed inside Building 124 below rooms 108-109-116-118, an office area that was built over the site from which former decay holding tanks were removed in the 1960's. Sub-surface sampling was also performed inside Building 124 in the area of the hot cells. Access piping extends below and along the hallways behind the hot cells, as do sewer pipes and drain lines. These systems were accessed and surveyed through multiple points. The ventilation system was accessed and surveyed also. The licensee provided a weekly expected schedule of events to the NRC so that inspections could be performed as needed.

Most of the outdoor surveys and sampling were completed before winter weather would interfere with surveying. Indoor surveys were completed by February 22, 2002. The characterization report and the decommissioning plan are expected to be completed by the end of March or early April. After final surveys and release, Building 124 will be renovated, with much of the Building being demolished. Building 122 is also expected to be demolished. Underground tanks will be removed and disposed of. The licensee is aware that they possess generally-licensed EXIT signs in the buildings, and plans to dispose of them prior to demolition (37 signs are in Building 124).

II. Deep Core Sampling of Holding Tank Areas

a. Inspection Scope

Inspectors observed the drilling of 2 boreholes and the collection of soil samples from the underground tank vault near Building 124.

b. Observations and Findings

On January 9th, deep core samples were to be collected from two underground tank areas. Duratek sub-contracted with another company to perform the borehole drilling. This company has performed drilling and collection of soil samples for site characterization for Squibb and other companies in the past, for both radiological and other hazards.

The first area to be drilled was located near Building 83 and contains two 8,000-gallon tanks. These tanks were used to collect washwater from the animal cage wash facility. The animal cage wash facility cleaned cages which housed rabbits formerly used for pyrogen testing of radiopharmaceuticals. However, at the time of the inspection, the location of these tanks was too sloped and muddy for the drill rig to access it. It was decided that another, smaller, drill rig would be brought in another day to sample this area.

The second area to be drilled was located adjacent to Building 124. This area contains, four 10,000-gallon tanks that were installed in an underground vault in the early 1960's. The tanks were used to hold wastewater from the manufacturing facility, and would have contained primarily molybdenum/technetium and iodine-131, although other radionuclides may have also been held in the tanks. Wastewater was stored in the tanks until sampled and determined to be acceptable for sewer release. Based on past use history of the tanks, no leakage of the tanks was known, and therefore no contamination of the surrounding soil was expected. In addition, most radionuclides used at the site were short-lived. According to blueprints, the tanks were about 12-15 feet deep. Four core samples were to be collected, one from each side of the vault, to a depth of about 18 feet. Split-spoon samples were used to collect soil from the borehole. Samplers were 2 inches in diameter.

The inspectors observed sample collection from the first two boreholes of the day. The soil in the areas tested was sandy, loose, and very wet, so the boreholes were relatively easy to drill. Although the licensee expected to collect samples from every 1-2 feet, in some cases, the condition of the soil was such that only a very small sample was collected in that distance, typically less than half the capacity of the sampler. The GTS representatives stated that they will likely have to consolidate soil samples collected in the first 10 feet or so from the surface. Soil below the tank depth was more compact, and samples from that depth were large and will be analyzed separately.

Each sample was taken from the split spoon collector and placed in its own plastic bag, which was labeled with a sample identification code and the location and depth from which the sample was taken. A separate log of the samples was also maintained. Samples were taken into an area of Building 124 that GTS was using to dry soil samples and process them for future analysis. GTS plans to perform gamma spectroscopy of the samples on site, prior to sending samples out for full analysis. Samples of surface soil are already processed and contained in Marinelli beakers, waiting for the instrumentation to arrive at the site so that preliminary analyses can be performed. Soil samples have also been split with Squibb so that duplicates are maintained and comparative analyses may be performed.

Soil samples will be sent offsite for analysis, after initial preparation and an on-site gamma spectrometry to determine the radionuclides and some idea of the quantity. Additional sampling was planned outside under asphalt areas where spills occurred, and behind Building 122 where equipment that may have been contaminated was stored.

c. Conclusions

No violations were identified.

III. Surveys of Laboratory Facilities in Building 124

a. Inspection Scope

Inspectors toured facilities already surveyed. Inspectors observed characterization surveys conducted in and around Building 124 and the instrumentation used. Inspectors reviewed records of instrument calibration and operation.

b. Observations and Findings

Areas of elevated contamination (greater than 2500 dpm/100 cm²) were marked. Most of these areas were isolated to identifiable spots, rather than widespread areas. Most equipment was removed from the facilities, so that most laboratory rooms contained only the fixed hoods, lab benches, cabinets, and similar fixtures. Ventilation systems remained on. Hot cells have been opened and the remote handling equipment removed to a storage area. Although there was residual contamination in the hot cells, it was expected to be from small quantities of long-lived contaminants that were in the large quantities of very short-lived radionuclides that were formerly handled in the hot cells (iodine-131, technetium-99m, strontium-85)

On January 17th, the inspector observed Duratek personnel surveying Room 190, a Class 2 area. Scan surveys were performed using a Ludlum 2350-1 Data Logger connected to a 43-68 gas-flow proportional detector. Two of these survey systems were in use. Surveys in Class 2 areas are expected to cover about 20% of all surfaces. The inspector observed surveys of the floors, ceiling, walls, interior and exterior of the hood, and inside cabinets and drawers. The technicians also performed surveys of areas they considered likely to be contaminated, such as the floor behind the hood

cabinet. Any scanned area that exceeded the alarm level (equivalent to 2500 dpm/100 cm²) was marked, and a static count was performed of that area. Static point surveys were also performed of random areas when scan surveys were completed. The static surveys were 1-minute counts, using a lucite beta-shield for the gamma survey; a second static count was performed at the same point without the beta shield. Alpha surveys are also planned, although the licensee did not use alpha-emitting radionuclides at this facility. The technicians stated that background counts were taken in several areas of the room, of the variety of surfaces, prior to beginning scan surveys. The inspector questioned if these areas were good representatives of background; the technicians, based on their experience with the equipment and surveys using the equipment, believe this was an acceptable practice in this building.

Calibration records for the survey equipment were reviewed during the January 17th and February 20th inspections. The instruments were source-checked before performing the scan surveys. Instruments are source-checked before and after performing static surveys. Technetium-99 and carbon-14 sources were used. Both survey systems were routinely checked as required. The response of the two different systems were similar, although one system was consistently higher in response than the other.

On February 20th, background surveys were being performed in Buildings 109 and 125. These buildings were chosen because they were built at approximately the same time as Building 124 and using similar materials. These buildings are also located near Building 124.

Smear surveys for removable contamination were performed. All smears will be sent offsite for counting.

c. Conclusions

No violations were identified.

IV. Surveys of Pipes in Building 124

a. Inspection Scope

The inspectors reviewed the licensee's procedures for performing characterization surveys of pipes in Building 124.

b. Observations and Findings

The licensee conducted surveys of drains and pipes in Building 124. There are three types of pipes in and around Building 124. Process pipes were used in the manufacturing and distribution operations and the licensee considers these drains to be class 1, contaminated. The licensee plans to remove all of the class 1 drains for disposal as radioactive waste. The regular drains in the Building are considered class 2 and were surveyed in more detail to determine their radiological status. Storm sewers and storm water hold-ups are considered class 3 but were surveyed to verify that they are free of contamination.

The licensee conducted surveys of process pipes by taking measurements with a gas flow proportional counter over drains and clean-out areas. The licensee has also taken two borehole samples at the rear of the hot cells where process drains flowed from the hot cell area. These holes were bored well below the 18 inch concrete slab to check for contamination leakage from these pipes.

The licensee took measurements in the regular drains and storm sewer drains (class 2 and 3) using specialized GM probes. The licensee fed a cable through a pipe and attached the cable to the probe at the other end of the pipe. The probe was then pulled through the pipe using the cable. Two types of probe configurations were used to take measurements in these pipes. One type was used for larger pipes and has three GM probes placed in a triangular configuration with the sensitive side of the probe facing out toward the wall of the pipe. The probes were mounted on legs with spring levers and wheels. The levers expand to the diameter of the pipes, placing the wheels against the interior pipe wall, maintaining the probes in a fixed geometry just slightly above the wheel on each of the legs. A second type of probe configuration was used for smaller pipes. It contained a single cylindrical GM probe with a 360 degree side window. Three legs with wheels were attached to the centrally located probe. The wheels moved along the interior walls of the pipes maintaining a fixed geometry.

c. Conclusions

No violations were identified.

V. Exit Meeting

a. Inspection Scope

On February 20th, the inspector met with staff from Squibb, Duratek, and GLS to discuss the results of the inspection.

b. Observations and Findings

The inspector informed the licensee that characterization surveys appeared to have been in accordance with the regulation and the licensee's plan for characterization. The licensee expected to complete characterization by February 22, 2002. The licensee is planning a meeting in the April time frame with the NRC, and the State of New Jersey to discuss the results of the characterization surveys and their plans for decommissioning and final surveys.

c. Conclusions

No violations were identified.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

*+Michael Vala, RSO, Bristol-Meyers Squibb (BMS),
*+John Frankowski, BMS
Craig Woodard, CIH, CSP, director, EHS, BMS
Larry Gaines, BMS, HP
Debbie Silva, BMS, HP
Dan Whalen, BMS, Engineering

Duratek, Inc.

*+Paul Ely, Duratek, Inc., on-site manager
Doug Kjos, Duratek, Inc., HP tech
Betty Kjos, Duratek, Inc., HP tech

TLG Services

*+Beverly Good, oversight consultant for decommissioning, TLG Services

State of New Jersey

Ed Truskowski, NJDEP
Richard Peros, NJDEP

* Present at the entrance meeting
+ Present at exit meeting