

U. S. NUCLEAR REGULATORY COMMISSION

REGION V

~~DRAFT~~

Final [Confirmed by
consultation with R. Thomas
7/13/82] RMW

Report No. 99990005/82-02

Former AEC
License Nos. D-607, C-3966, C-4589, STC-139, STC-595, STB-595, SNM-535

Licensee: Teledyne Wah Chang Albany

1600 N. E. Old Salem Road

Albany, Oregon 97321

Facility Name: _____

Inspection at: Albany, Oregon Facility

Inspection conducted: June 15, 1982

Inspectors: B. A. Riedlinger _____ June 28, 1982
B. A. Riedlinger, Radiation Specialist Date Signed

Approved by: R. D. Thomas _____ 6/29/82
R. D. Thomas, Chief, Materials Radiation Protection Section Date Signed

Summary:

Inspection of Teledyne Wah Chang Albany facilities used under AEC Licenses D-607, C-3966, C-4589, STC-139, STC-595, STB-595 and SNM-535

Areas of the Teledyne Wah Chang Albany facility which had been used for analysis and processing of uranium and thorium compounds under AEC Licenses D-607, C-3966, C-4589, STC-139, STC-595, and STB-595 were surveyed at the request of NRC Headquarters. An area survey was conducted using instrumentation capable of detecting minute quantities of gamma emitting materials. Also, several wipes were taken and counted later in NRC Region V on a gas-flow proportional counter.

The inspection of the Teledyne Wah Chang Albany facilities involved a total of six and one-half hours on site by one NRC inspector.

Results:

The radiation levels detected in areas of the facility that had been used in conjunction with AEC licensed activities under AEC Licenses D-607, C-3966, C-4589, STC-139, STC-595, and STB-595 indicated only background readings.

Materials previously licensed under SNM-535 are presently covered by the State of Oregon License ORE-0001-1 (Amendment 1 to License 36-0001-01 (G67) dated October 27, 1965).

On the basis of the survey findings, it is concluded that the site was adequately decontaminated and is suitable for unrestricted use.

DETAILS

1. Persons Contacted

Mr. R. T. Van Santen, Environmental Control
Mr. Dan Long, Administration and Security
Mr. Ralph McLain; Supervisor
Mr. Jake Hiebert, Operator
Mr. Don Robb, Technician

2. Background

In a memorandum dated April 13, 1982, Richard Cunningham, Director, Division of Fuel Cycle and Material Safety, NMSS in NRC Headquarters, asked G. S. Spencer, Director, Division of Radiological Safety and Safeguards Programs, Region V, to determine whether or not Teledyne Wah Chang, Albany had adequately decontaminated their site prior to termination or expiration of AEC License SMB-135.

A files search indicated that AEC License SMB-135 applied only to activities conducted at Wah Chang, Glen Cove, New York. However, Wah Chang, Albany had seven AEC Licenses: D-607, C-3966, C-4589, STC-139, STC-595, STB-595, and SNM-535.

Activities that were previously licensed under SNM-535 are presently covered by the State of Oregon License ORE-0001-1 (Amendment 1 to License 36-0001-01 (G67) dated October 27, 1965).

The AEC license issuance and expiration dates, as well as the activities that they authorized are listed below:

License D-607: issuance date unknown
expired December 1, 1958

Activities authorized by this license:

Possession and use of 1,600 pounds of uranium and thorium compounds for manufacturing tungsten wire and columbium metal at plants located at Glen Cove, New York, and Albany, Oregon.

License C-3966: issued January 23, 1958
expired January 31, 1959

Activities authorized by this license:

Possession and use of 2,500 pounds of thorium oxide as an analytical reagent and in the manufacturing of thoriated tungsten wire and columbite and tantalum metal.

License C-4589: issued February 18, 1959
renewed February 17, 1960
expired February 28, 1961

Activities authorized by this license:

Those activities previously authorized by License C-3966.

License STC-139: issued March 14, 1961
expired April 30, 1962

Activities authorized by this license:

Possession of 2,881 pounds of source material for storage only and not for processing in any manner.

License STC-595: issued May 25, 1962
expired May 31, 1965

Activities authorized by this license:

Storage only of 2,881 pounds of thorium.

License STB-595: issued August 1, 1962
expired July 31, 1965

Activities authorized by this license:

Use of 5,000 pounds of thorium as a refractory material in furnaces.

License SNM-535: issued October 3, 1961
expired October 31, 1962

Activities authorized by this license:

Possession and use of 0.13 gram of U-235 contained in analytical standards.

Inspections were conducted at the Teledyne Wah Chang Albany facility on the following dates: March 27, 1958, October 16, 1958, June 14, 1960, July 18, 1962, and January 22, 1964.

An NRC Region V inspector was at Teledyne Wah Chang Albany on June 15, 1982 to conduct a closeout survey of areas used under the expired AEC licenses D-607, C-3966, C-4589, STC-139, STC-595, and STB-595.

The survey criteria were based on the requirements established by "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material," November 1976.

3. Discussions with Licensee Representatives

Licensee representatives stated that the main use of AEC licensed material was the use of thorium oxide as furnace refractory. As other materials were used in the furnaces, some contaminated waste materials were generated in the process.

The Teledyne personnel were not able to locate a complete set of receipt and transfer records for the former AEC licensed materials. However, they did have records of transfer of the following materials:

- 3-17-59 500 lbs. thorium oxide shipped to Davison Chemical Company.
- 4-4-59 3.0 lbs. thorium oxide shipped to Boeing Aircraft.
- 10-11-61 about 242 lbs. of thorium oxide in waste materials shipped to Idaho National Engineering Lab (the total shipment weighed 8,520 lbs.).
- 7-65 2,391.0 lbs of thorium oxide were transferred to Nuclear Fuel Services, Erwin, Tennessee.

Teledyne personnel believed that at least two other shipments were made to dispose of waste materials generated during the use of the thorium oxide as furnace insulation. Unfortunately, no records of those transfers could be located.

Mr. Van Santen believed that all the materials under AEC licensure were transferred before Teledyne Wah Chang Albany received their first State of Oregon license, Number 36-0001-001 (G67) issued on July 16, 1965. However, that license authorized the possession and use of 50 pounds of thorium solutions, compounds, powders, and crystals; 100 pounds of tungsten or refractory material doped with thorium or thorium compounds; and 5,000 pounds of thorium oxide. Therefore, either the materials formerly under AEC licensure were transferred for disposal or were covered by the initial State of Oregon license.

The areas of the plant that had been used in conjunction with activities conducted under AEC licensure are now radiologically clean and are still in use in modified conditions. These areas were surveyed as described below.

4. Reference Sources

An NRC Region V americium-241 counting source was selected for use in determining the efficiency of the laboratory proportional counter (NRC #383). The americium-241 calibration source had an activity of 0.1 microcurie on June 23, 1966. The efficiency of the counter was determined to be 15 percent.

An NRC Region V depleted uranium slab source (6" X 6"), NRC number 009615 was selected for use in determining the response of the micro-R meter (NRC #006383). At two feet above the uranium slab, the reading was 25 micro-R per hour. At one foot above the slab, the reading was 100 micro-R per hour. At the surface of the slab, the reading was 20,100 micro-R per hour.

An NRC Region V Plutonium Alpha Standard Set, NRC number S94-4 was selected for use in determining the efficiency of the alpha survey instrument (NRC #006387). The average efficiency was determined to be 26 percent.

5. Field Radiation Detection Instruments

The field radiation detection instruments selected to perform this survey were:

- a. Eberline Model PRM-7 micro-R/hr meter, NRC #006383 calibrated on March 31, 1982 and due for recalibration on March 31, 1983. The instrument had a background of 4 micro-R per hour.
- b. Eberline Model PRM-6 Pulse Rate meter (alpha survey instrument) NRC #006387 calibrated on July 10, 1981 and due for recalibration on July 10, 1982.

6. Acceptable Release Levels

Activities that were conducted under AEC licenses involved primarily thorium oxide.

The acceptable surface contamination levels for natural thorium, as described in the guideline, will be used for this survey. Those levels are summarized in Table I:

TABLE I
ACCEPTABLE SURFACE CONTAMINATION LEVELS

	<u>MAXIMUM</u>	<u>AVERAGE</u>	<u>REMOVABLE</u>
Radiation	1.0 mrad/hr at 1 cm (1000 micro-R/hr)	0.2 mrad/hr at at 1 cm (200 micro-R/hr)	N/A
Contamination	3,000 dpm/100 square centimeters	1,000 dpm/100 square centimeters	200 dpm/100 square centimeter

7. Wipes Survey

Removable contamination was evaluated by wiping surfaces using Whatman #42 filter paper with moderate pressure applied over an area of 100 square centimeters. The wipes were counted in a Region Y NMC PC-55 gas flow proportional counter (NRC Serial Number 383) on June 22, 1982.

The results of the analysis of the wipes taken on June 16, 1982 and analyzed on June 22, 1982 are tabulated in Attachment I. The locations of the wipes are shown in Figures I, II, and III.

8. Areas Surveyed

a. Building 20

Building 20 was the location of the furnaces used when thorium oxide was used as an insulating material. The old furnaces and contaminated supporting bricks, etc. have been removed. Some furnaces are still in use for projects involving non-radioactive materials.

The inspector surveyed the designated area with the micro-R per hour meter. Readings ranged from 5 to 12 micro-R per hour. Four wipes were taken in this area to check for removable contamination. No significant removable contamination was detected.

Butler Building

One furnace had been located at the rear of the Butler building.

The inspector surveyed the designated area with the micro-R per hour meter. Readings ranged from 4 to 5 micro-R per hour. Three wipes were taken in this area to check for removable contamination. No significant removable contamination was detected.

c. Former Site of Storage Shack

A storage shack had been used to store licensed materials. The shack has been dismantled. The site is presently a parking area.

The inspector surveyed the designated area with the micro-R per hour meter. Readings ranged from 4 to 12 micro-R per hour. One wipe was taken at the edge of the driveway in front of the Butler building. No significant removable contamination was detected.

d. Building 17

Building 17 was used for compaction of some licensed materials.

The inspector surveyed the area with the micro-R per hour meter. Readings ranged from 4 to 5 micro-R per hour. Four wipes were taken in this area to check for removable contamination. No significant removable contamination was detected.

9. Conclusion

A survey of the Teledyne Wah Chang Albany facilities that had been used in conjunction with activities licensed by the AEC indicates that radiation levels range between 4 and 12 micro-R per hour and that removable contamination does not exceed acceptable release levels.

On the basis of this result, it is concluded that the site was adequately decontaminated and is suitable for unrestricted use.

ATTACHMENT I

WIPE TEST CONTAMINATION SURVEY

<u>Location Noted on Figure I or II</u>	Results in net dpm per 100 square centimeters	
	<u>Alpha</u>	<u>Beta-Gamma</u>
1, Bldg. 20	0	67
2, Bldg. 20	0	40
3, Bldg. 20	0	49
4, Former Storage Shack Site	0	75
5, Butler Building	0	33
6, Butler Building	0	27
7, Butler Building	1	9
8, Bldg. 20	0	40
9, Bldg. 17	1	53
10, Bldg. 17	0	20
11, Bldg. 17	1	69
12, Bldg. 17	4	13

Figure I
Locations of Contamination Wipes Taken in Bldg. 20, in the Butler Bldg., and at the former site of the storage shack

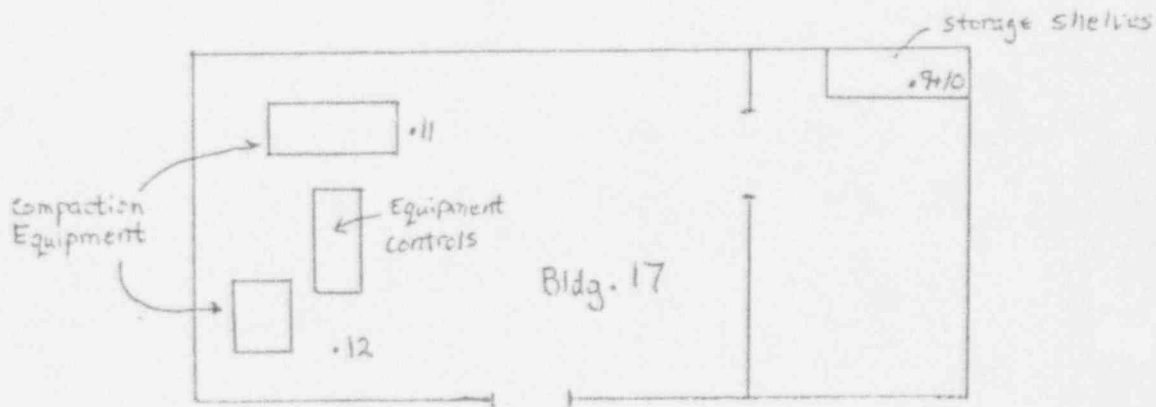
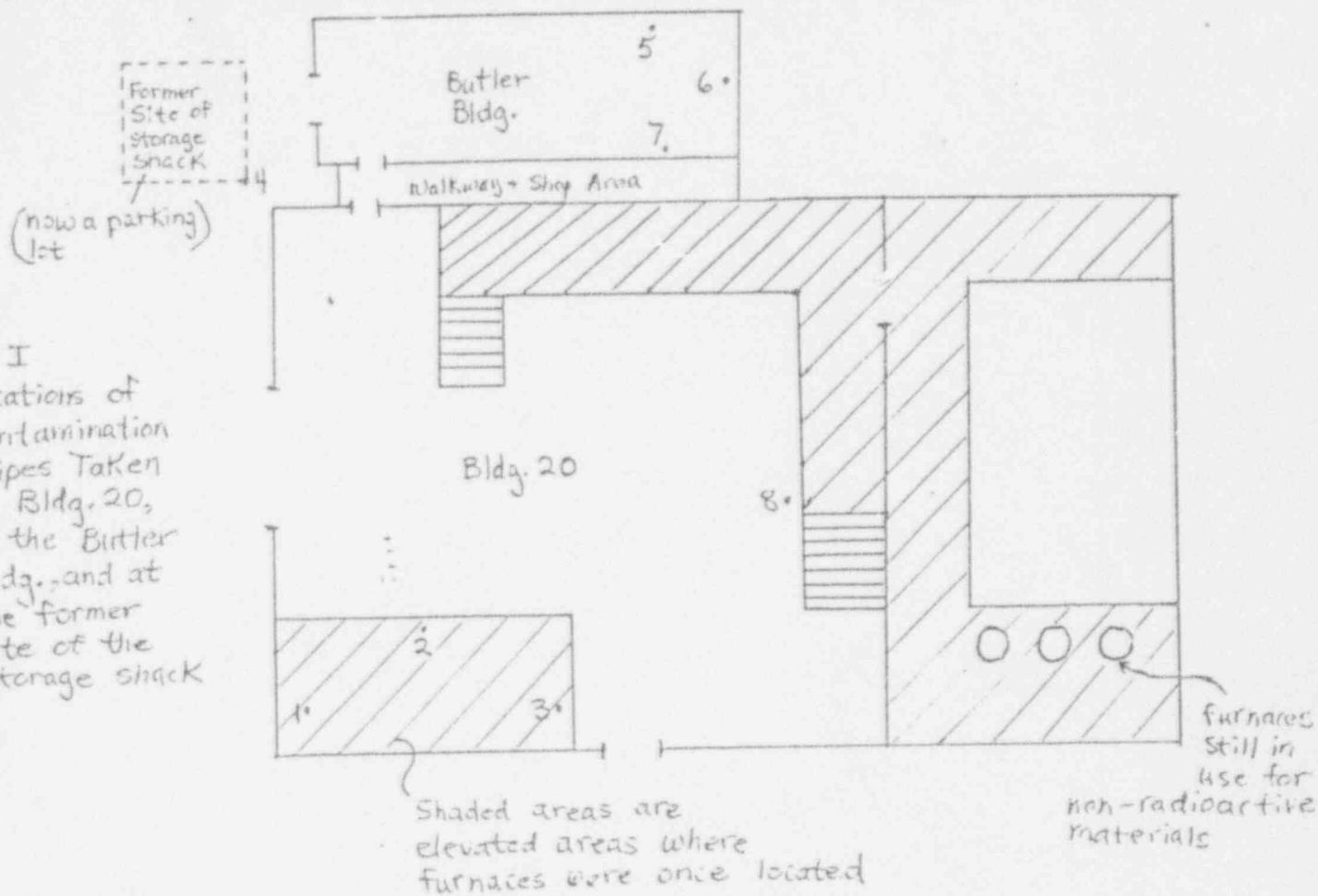


Figure II
Locations of Contamination Wipes Taken in Bldg. 17

