

*Consultants on Radioisotopes
for the Medical Profession*

9842 MANCHESTER ROAD

ST. LOUIS 19, MISSOURI

Phone WOodland 2-2162

December 29, 1959

Mr. Cecil Buchanan
Chief, Isotopes Branch
Division of Licensing & Regulation
U. S. A. E. C.
1717 "H" Street, N.W.
Washington 25, D.C.

Dear Mr. Buchanan:

First, I should like to thank you and Mr. Mason for taking so much time from your busy schedule last week to discuss our particular problems.

As I told you during that visit, we have found it desirable from time to time to be able to easier dispose of limited quantities of by-product material wastes both from our laboratory operations as well as from some of our clients. I have often said I do not wish to become a commercial disposal agent as I do not feel this type of endeavor would be compatible with our radiopharmaceutical business.

We have, however, found it increasingly difficult to handle the disposal of small experimental animals who have very small amounts of by-product material remaining in the carcass. Recently several research laboratories in the local hospitals here have given us a desperate call to assist them on the same problem.

After a careful study of the problem, we feel the safest, easiest and least costly procedure would be to incinerate these animals and other such waste materials, thereby reducing the volume of disposal material by at least tenfold.

Below are listed the levels of contamination to be handled, the procedures, the equipment and all other pertinent data on how we intend to handle the problem.

The incinerator we propose to use is the Martin Burn-A-Way Gas Incinerator Model #4416. This unit has a capacity of $1\frac{1}{2}$ bushel, gas used - natural, front and after burner capacity 35,000 BTU per hour, grate is cast iron, flue connection is 6" in diameter. Attached is the manufacturer's literature on this unit.

The following is the information requested for commission approval of treatment or disposal by incineration.

A. The type, quantity and form of by-product material to be incinerated.

Type - mostly small animal carcasses, excreta, paper and similar ashable contaminated materials.

Quantity - the limits for all beta and/or gamma emitting isotopes shall be set at 100 uc per load and 500 uc per day.

Chemical Form - Any

- B. The method of measurement of, or estimation of the concentration of radioactive material in the effluent at the point it leaves the stack.

The stack on this incinerator will be approximately 10 feet above the top of our building which is some 20 feet from the ground. A small copper tubing ($1\frac{1}{2}$ " to 1" diameter) will be attached to the top of the stack and brought down to ground level where a special fitting will be used to attach a Hi-Volume staplex air sampler. The air sampler will be operated during each burning cycle. The Watman No. 41 filter paper used in the air sampler will then be counted in a Nuclear Measurements proportional counter Model PCC10A to determine the gross beta count. From this count and knowing the total volume of air pulled through the paper, the total gross beta concentration of the air can be determined. This should not exceed 10^{-7} uc/cc. This level is set as an upper limit since stack effluents from a stack 20 to 30 feet high are known to be diluted by a factor of greater than 100 times before reaching the ground. Hence, the concentration at "nose level" (4 to 5 feet from the ground) will always be less than the level listed in Title 10 CRF 20 for unidentified beta or gamma emitters of 10^{-9} uc/cc. This procedure will be carefully followed during the first few runs along with an air sampling at "nose level" to check the accuracy of our calculations and assumptions. All results will be logged in a permanent record book.

The rating of the unit to be used is 35,000 BTU per hour. This will result in a total volume of air out the stack of about 1000 cu. feet per minute or a total of about 10^9 cc in the one hour during which the material is being incinerated. Assume a total of 100 uc for a single load. The average concentration of the effluent air if all of the material was volatilized out the stack would therefore be about 5×10^{-8} uc/cc. Actually something like 90% of most materials will remain in the ash leaving a stack contamination of less than 5×10^{-9} uc/cc.

- C. Methods of Control to insure that particulars to concentration of radioactive materials are not released which could result in exposure of individuals in excess of the levels set forth in the AEC's standard for protection against radiation, part 20.

As outlined in B above the effluent gases will be monitored during each run. If, at any time, the measured contamination is above the calculated value no further material will be incinerated until the cause for the discrepancy is determined. A wire screen will be placed on the top of the stack to prevent any possible fly ash to escape. As you will note from the enclosed description of the incinerator an after burner in the unit prevents any smoke or fly ash from entering the stack.

- D. The height of the incinerator stack, expected dilution factors, and the

height of and distance to buildings in the surrounding area.

The stack will be about 10 feet above the rooftop and approximately 30 feet above the ground level. See part B above for the expected dilution factor. The enclosed sketch will show the relation of ours and other buildings in the area.

- E. The procedures which will be followed to prevent overexposure of personnel during all phases of operation - particularly the instructions given to the persons handling the combustibles and the ashes.

The unit will be set up outside in back of our labs in a fenced-in area. Materials will be burned by or only under the direct supervision of one of the following persons:

1. W. R. Konneker, Ph.D - President
2. Richard L. Curtin - Director of the labs
3. Ralph Nuelle - Safety Officer

All material to be incinerated must be wrapped in a heavy paper or a light plastic bag for easy and safe handling. If material is stored before incineration, it will be stored in the locked room provided for storage (see existing licenses) and properly marked with material, total contamination, type of contamination and total weight of material. No more than 1 bushel of material (capacity $1\frac{1}{2}$ bushel) will be loaded at one time containing no more than a total of 100 uc. If more than one load is to be incinerated per day, the total per day shall not exceed 500 uc. The ash trap in this unit should hold about 10 loads before it requires emptying. A 55 gallon steel drum which meets ICC requirements fitted with a plastic liner bag will be kept next to the incinerator. The drawer is carefully removed and the ashes are completely wet down with a fine water spray before they are dumped into the 55 gallon ash waste disposal drum. Each load of wet ashes is slurred with 5 to 10 pounds of dry cement. The cement will absorb the excess moisture from the wet ashes and will harden the contents into a fairly solid mass, and at the same time increase the density of the contents for better shielding properties.

- F. Method for the disposal of contaminated ash.

See E above for the procedure of removing the ash from the burner and packing this material. It will then be shipped to a licensed disposer of such material such as the Oak Ridge National Laboratories or a commercial disposer such as Isotopes Specialties in California

An incinerator log book will be kept on all runs made. The following information will be permanently recorded in tabular form.

1. Item Number.
2. Date.
3. Where material came from (our labs or from outside client).
4. Name of persons disposing item.

5. Contents of package or discription of item.
6. Total weight.
7. Activity level (in uc or d.p.s.)
8. Weather conditions on day burned
9. Remarks
10. Signature of person actually placing the material in the incinerator.

I hope the above information is complete and adequate for you to process our enclosed request for a limited waste disposal license. The procedures established were done in cooperation with our west coast manager, Mr. Richard Dickey, health physicist, who had considerable experience in the procedure while associated with the AEC project at UCLA medical school. The assumptions and calculations were also based on information obtained from the following library references.

1. Reduction of Combustible, Low Level Contaminated Wastes by Incineration By L. B. Silverman and R. K. Dickey. From TID-7512 a Conference on Radioactive Isotopes in Agriculture.
2. Schauer, P. J.: Pilot Plant Work on Solid Burnable Waste Disposal for Mound Laboratory. Mound Laboratory Report MLM 232, Nov. 1, 1948.
3. Report on Design for Volume Reduction of Combustible Radioactive Wastes by Incineration. Arthur D. Little, Inc. Report ALI-C-57867, June 1950
4. Maximum Permissible Amounts of Radioisotopes in the Human Body and Maximum Permissible Concentrations in Air and Water, NBS Handbook No. 52.
5. Proposed Atomic Energy Commission Policy Governing Allowable Radioactivity in Wastes Discharged by A.E.C.. Contractors. Private Communication from Forrest Western, Atomic Energy Commission, Washington, D.C., Mar. 15, 1952.
6. Church, P.E., and Goline, C. A. Jr.: Characteristics of Mixing and the Dilution of Waste Stack Gases in the Atmosphere. Hanford Engineer Works Report MDDC-73, April 1946.
7. Leverett, M. C., Rupp, A. F., Beall, S. E., and Bornwasser, L. P.: Behavior of Stack Gases in Still Air, Clinton Laboratories, AECD-2909, April 1950
8. Kruse, C. W., Freese, P.V., Machis, A., and Behn, V. G.: Behavior of Institutional Incinerators When Used to Burn Radioactive Wastes. John Hopkins University, NYO-4517, November 1950

If you require any further information, please contact me at your earliest convenience by phone or mail.

Very truly yours,

NUCLEAR CONSULTANTS CORPORATION

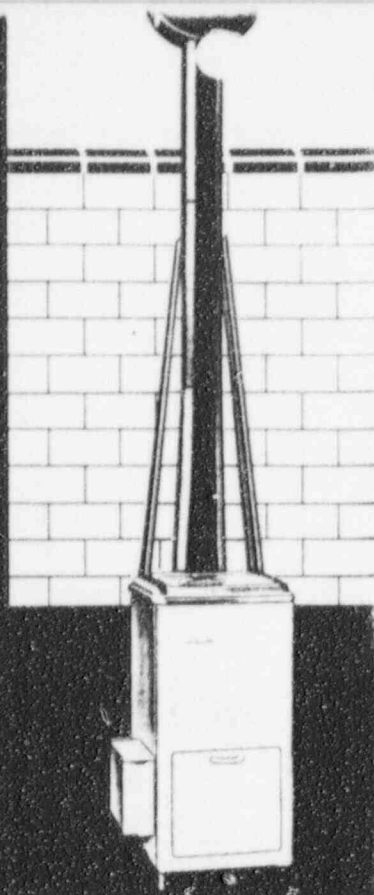
W. R. Konneker, Ph.D.
President

WEATHERPROOF OUTDOOR CONVERSION KIT NO. 1

Where suitable flues are not available, the Martin Builders Model (4416) can be equipped with this outdoor kit which includes:

- ① Weatherproof control cover.
- ② Prefabricated porcelain flue approximately 8 feet with cap.
- ③ Steel Base.

Easily installed outdoors, this kit brings the cost of owning a convenient Burn-a-Way incinerator within limits of the modest budget. Vital parts are protected insuring years of safe dependable trouble free service. Shipping weight 30 lbs.



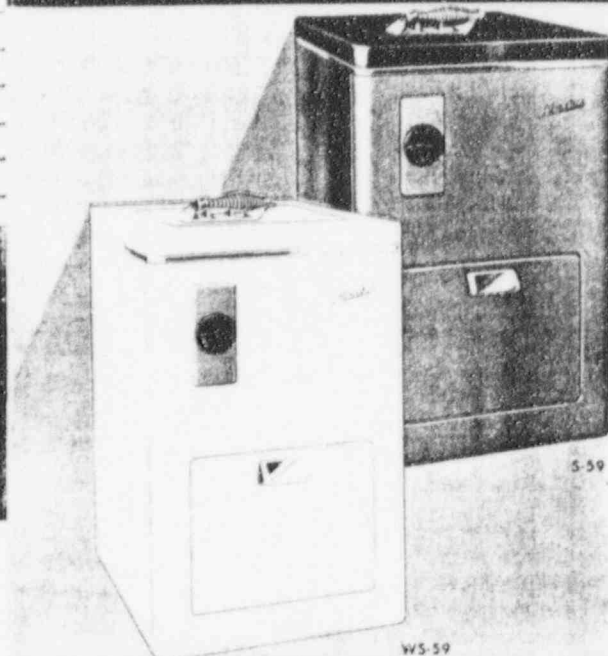
MARTIN STAMPING & STOVE CO.
Huntsville, Alabama

LITHO U. S. A.

FUEL



BURN-A-WAY GAS INCINERATORS



Deluxe Smokeless-Odorless Models, Brick or Steel
Lined — Finished in Gleaming Lifetime Porcelain

**MORE MODELS TO CHOOSE FROM
More Beneficial Features**



Backed by over 50 years of experience in the combustion engineering field, this new line of appliances literally makes household trash and garbage "disappear into thin air".

In the deluxe line you can choose between

- ① A lifetime porcelain finish of gleaming white or serviceable two-toned green.
- ② Rugged combustion chambers of fire brick or heavy gauge ceramic coated steel.

All have automatic timers for added convenience and economy of operation.

**HEAVY
GAUGE
STEEL**

**5 YEAR
GUARANTEE**
ON EITHER STEEL
OR BRICK LINING

**FIRE
BRICK
LINING**

MODELS

S-59-C (Green)
WS-59-C (White)

MODELS

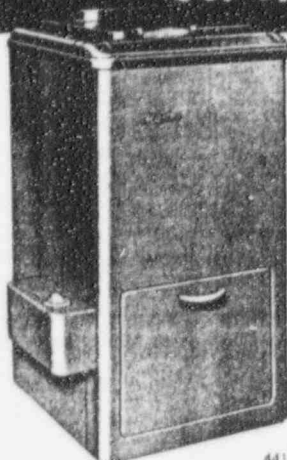
S-59-B (Green)
WS-59-B (White)

A. G. A. APPROVED

AUTOMATIC

Set it and Forget it!

ODORLESS • SMOKELESS



SPECIFICATIONS

Deluxe Models S-59 and WS-59 20 1/2" wide, 21" deep, 35 1/2" high, capacity 1 1/2 bu., cast iron grate, Nat., Mfg., or LP Gas, Top opening 10" x 9 1/2"

Builders Model 4416 19 1/2" wide, 19 1/2" deep, 38" high, capacity 1 1/2 bu., cast iron grate, Nat., Mfg., or LP Gas, Top opening 9" x 8"

Builders Model: Exterior finish of high temperature baked enamel, heavy gauge galvanized steel combustion chamber. Automatic controls and approved for smokeless-odorless operation.



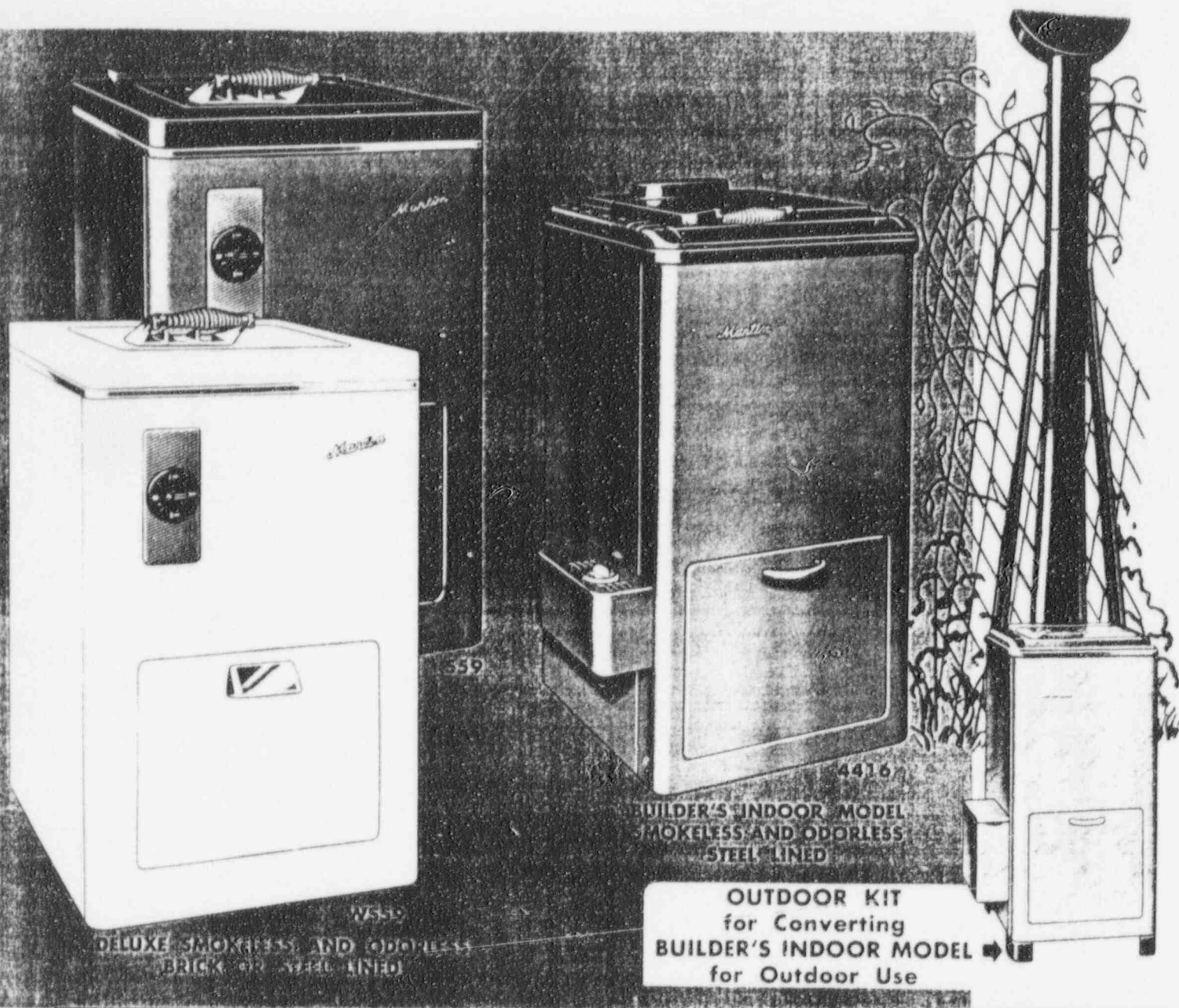
Smoke, odor and fly ash are unburned products of combustion. The patented after burner of the Martin Incinerator completes the combustion process and is one of the few officially approved as smokeless-odorless.

**12,000 BTU
MAIN BURNER
INCINERATES
LOAD.**

**23,000 BTU
AFTER-BURNER
COMPLETE
INCINERATION
BURNING
SMOKE &
ODOR.**

4416

HEALTH



NEW GAS FIRED DISPOSER MAKES MAGICIAN OF HOUSEWIFE

The most exciting new product story of the decade. After years of extensive engineering research, Martin now brings you an appliance that can be installed in your home and literally makes household trash and garbage "disappear into thin air." The new Martin Gas Fired Incinerators can be

installed in the kitchen, utility room, basement, or wherever it is handiest. Both garbage and trash are disposed of without a trace of smoke or a whiff of odor. Where suitable flues are not available, Martin offers the new Outdoor Kit for installation of the "Builder's" model outside.

Martin

BURN-A-WAY
GAS INCINERATORS
S-59 - WS-59 - 4416 - OUTDOOR KIT

23283



Use a *Martin*

to "Burn-A-Way" all
TRASH and WET GARBAGE

—Automatically—
Set it and Forget it!

The
TRICK
IS:

12,000 BTU
MAIN BURNER
INCINERATES
LOAD.

23,000 BTU
AFTER-BURNER
COMPLETES
INCINERATION
BURNING ALL
SMOKE AND
ODOR.



Just as the flame from a match held over a lighted cigarette burns the smoke, so the patented "after-burner" of the Martin Incinerator burns smoke, odor, and fly ash.

Models W559C, S59C, and 4416

Heavy Gage Steel
Lining with High
Temperature Ceramic
Finish

5 YEAR GUARANTEE
ON EITHER STEEL
OR BRICK LINING

Fire Brick
Lining

Models W559B, S59B

A. G. A. APPROVED
SMOKELESS and ODORLESS
SPECIFICATIONS

DELUXE MODELS S59 & W559

BUILDER'S MODEL 4416

Gleaming Lifetime Porcelain Finish 20 1/2" wide x 23" deep x 33 1/2" high Opening 10" x 9 1/2" Capacity—1 1/2 Bu Gas—Natural Manufactured or LP Front and after-burner rate—35,000 BTU per hour Grate—cast iron Flue Connection—6" Gas Connection 3/4" or 1/2" Controls—automatic timer with safety pilot Center of flue outlet to floor 28"

SHIPPING WEIGHT: S59B and WS59B 242 lbs.
S59C and WS59C 173 lbs.



Finished in high temperature baked enamel 19 1/2" wide x 19 1/2" deep x 38" high Top Opening 9 1/2" x 13" Capacity—1 1/2 Bu Gas—Natural Manufactured or LP Front and after-burner capacity 35,000 BTU per hour Grate—cast iron; Flue Connection 6" Gas Connection 3/4" or 1/2" Automatic timer with safety pilot Top flue outlet

SHIPPING WEIGHT: No. 4416 166 lbs.

NEW OUTDOOR KIT FOR CONVERTING BUILDER'S MODEL FOR OUTDOOR USE.

For use where Class A Fire is not available. This kit allows you to install the Builder's model outside. Vital controls are protected from weather conditions. The outdoor kit can be easily installed in a matter of minutes.

SPECIFICATIONS

- Outdoor Kit No. 1
- (a) Protective weatherproof control cover
 - (b) Prefabricated porcelain flue approximately 8 feet high consisting of three joints of pipe, supports, and cap
 - (c) Base

Shipping Weight 30 lbs.

MARTIN STAMPING & STOVE CO.

Huntsville, Alabama

LITHO U.S.A.

NO OTHER INCINERATORS OFFER SO MANY EXCLUSIVE FEATURES

Covered by Patent No. 2711139, 2726609 and other patents pending.

Nuclear Consultants Corp.

Consultants on Radioisotopes
for the Medical Profession

9842 MANCHESTER ROAD

ST. LOUIS 19, MISSOURI

Phone WOodland 2-2162

20' HIGH

400'

10' HIGH

Manchester Road

