



UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

JAN 16 1975

L. Manning Muntzing
Director of Regulation

WASTE BURIAL FACILITIES

This is in response to your request of November 20, 1974 that RO inspect all AEC licensed waste burial sites on a priority basis. This request for immediate inspections was prompted by notification that a Kentucky report on the Maxey Flats burial facility was about to be made public. An early draft of the Kentucky report concluded among other things that there had been some migration of Pu to the unrestricted environment. (The final Kentucky report released in mid-December stated that Pu and other radionuclides were measured in individual samples but the waste burial site did not create a public health hazard.) These special AEC inspections of five commercial waste burial sites, either partially or fully licensed by AEC, were completed on November 29, 1974 and are listed below:

Nuclear Fuel Services, West Valley, New York
Nuclear Engineering Co., Inc., Beatty, Nevada
Nuclear Engineering Co., Inc., Richland, Washington
Nuclear Engineering Co., Inc., Sheffield, Illinois
Chem-Nuclear Systems, Inc., Barnwell, South Carolina

This memo is a summary of the results of those inspections. In general, there was no evidence of any significant transport of radioactive materials through migration. In addition, based on offsite sampling by licensees and States, no impact to the offsite environment could be attributed to the operation of these waste burial facilities.

The RO Regional Directors were requested to have their inspectors determine, in detail, that which had been done to monitor for migration of radioactive material and review the results of these determinations. Inspectors were asked to obtain the maximum information possible concerning the complete operation of the burial sites. In addition, to provide a basis to judge the correctness of the licensee and State measurements, we requested the collection of samples from onsite sampling points for AEC analysis.

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Attachment 1 shows that as of the end of 1973, the total quantities of radioactive wastes buried at these facilities varied from about 200,000 cubic feet (Barnwell site) to almost 2,000,000 cubic feet of wastes (West Valley site). Average radioactive material concentrations at waste burial sites are generally in the range of tenths of a curie per cubic foot.

From the information gathered, it appears that licensees and States have initiated reasonable environmental monitoring programs which consider the major pathways to the public. A variety of samples as shown on Attachment 1, are collected and analyzed periodically. The licensee records of these analyses showed no evidence of any offsite environmental impact. In addition, State environmental monitoring programs which were established to check the facility operation conditions support these results.

All facilities with the exception of NFS have onsite monitoring wells to attempt to detect the movement of radioactive material away from the trenches. (NFS had used two nearby streams as such an indicator, but several test wells have recently been dug as part of a special study.) No significant activity due to waste burial was measured beyond burial trenches at any of the sites. A small amount of activity was found in some wells located fairly close to the trenches, but in those cases, the concentrations were several orders of magnitude lower than the concentrations in the trenches.

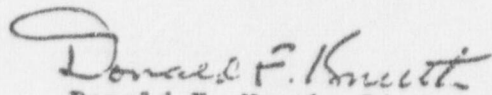
Samples from test wells or nearby streams collected during these inspections by RO inspectors were analyzed by the Health Services Laboratory, Idaho Falls. The data, as tabulated in Attachment 2, showed levels that agree well with licensee and State analysis results.

The location of the test wells for measuring migration are critical and there is no satisfactory means of determining that a suitable placement has been accomplished. Test wells placed close to the trenches can be bypassed by trench leakage, whereas wells too far away may not detect migration until it is significant. In addition, the depth of the test well is crucial since the possible migration elevation is not normally known. However, even if activity is detected in the test wells, this may, in many cases, be due to surface runoff into the well rather than lateral migration. Therefore, in order to make a more conclusive determination of migration of radioactive materials from the burial trenches, detailed studies on soil conditions, geological structure, underground water movement and meteorology, etc., would be required. Such studies are well beyond the scope of routine monitoring programs.

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L and RO recently met with a representative of the U. S. Geological Survey (USGS) and were informed that legislation requires USGS to survey existing waste burial sites in order to determine criteria for locating future waste disposal sites. USGS expects to initiate detailed studies in early 1975 on at least two of the burial sites covered in this report (Sheffield, Illinois and West Valley, N. Y.). It is anticipated that such studies will continue for several years and will provide the type of information NRC needs regarding containment at the current sites as well as provide the Commission and the Agreement States with criteria for siting future waste burial facilities.

In addition to material buried at the commercial waste sites listed above, there are significant quantities of radioactive material entombed at decommissioned reactor facilities, i.e., Bonus (50,000 Ci), Hallam (300,000 Ci) and Piqua (60,000 Ci). Also, a few licensees have been authorized to bury radioactive materials in private burial grounds in excess of the quantities specified in Section 20.304. A listing of these latter licensees has not been separately maintained by L. To identify those licensees would require an extensive and time consuming search of the files. However, during routine inspections, such special license authorizations are reviewed by the RO inspector but to our recollection there are no special requirements for monitoring for possible migration of radioactive materials. Additionally, it should be noted that the regulations grant all licensees authority to bury nominal quantities of radioactive material.



Donald F. Knuth, Director
Directorate of Regulatory Operations

ATTACHMENT 1

DESCRIPTION OF BURIAL SITES

Description	West Valley, N.Y.	Barnwell, S.C.	Sheffield, Ill.	Richland, Wash.	Beatty, Nev.
Initial Operation	1963	1971	1967	1965	1963
Volume Buried (Ft.3)	1,853,000	195,000	456,000	271,000	1,376,000
Special Nuclear Material (gm)	44,000	83,000	29,000	2,300	123,000
Source Material (lbs.)	372,000	65,000	58,000	11,000	41,000
Byproduct Material (Curies)	361,000	13,000	28,000	257,000	81,000
Onsite Sampling & Frequency	2 Onsite Streams (Quarterly)	10 Wells (Semiannual)	8 Wells (Quarterly)	3 Wells (Quarterly)	1 Well (Monthly)
Offsite Environmental Monitoring Program	Surface Water (Weekly) Vegetation (Annual) Soil (Quarterly) Air (Continuous) Animals (Semiannual) Fish (Semiannual) Milk (Weekly)	Water Supplies (Annual) Soil (Weekly) Vegetation (Annual) Animals (Annual) Air (Continuous)	Surface Water (Quarterly) Vegetation (Quarterly) Soil (Quarterly)	Surface Water (Semiannual) Vegetation (Quarterly) Soil (Quarterly)	Ground Water (Semiannual) Vegetation (Semiannual) Soil (Semiannual)

ATTACHMENT 2

INDEPENDENT MEASUREMENTS - WASTE BURIAL SITES

Burial Sites	Sample	Gross α dpm/ml	Tritium uCi/ml	^{144}Ce	^{137}Cs uCi/ml	^{60}Co
Chem-Nuclear	CN-1	<0.06	2.8 \pm .4E-6	<5E-8	2.1 \pm .5E-8	1.6 \pm
Barnwell, S.C.	CN-2	<0.04	1.7 \pm .4E-6	<5E-8	<8E-9	<9E-9
	CN-3	<0.04	1.7 \pm .4E-6	<5E-8	<6E-9	<5E-9
	CN-4	<0.01	1.7 \pm .4E-6	<6E-8	<2E-8	<9E-9
	CN-5	<0.04	<7E-7	<6E-8	<6E-9	<5E-9
NFS	Buttermilk Creek	<0.01	<1E-6	<5E-8	<6E-9	2.4 \pm
West Valley, N.Y.	Erdman Brook (NY #67)	<0.01	<1E-6	<6E-8	<6E-9	<5E-9
	Erdman Brook (NY #53)	<0.01	2 \pm 1E-6	<5E-8	<8E-9	<5E-9
	Hot-Cold Ditch (NY #73)	<0.02	<1E-6	<6E-8	1.5 \pm .1E-7	<9E-9
	Ditch North (NY #74)	<0.02	2.9 \pm .1E-5*	<5E-8	1.3 \pm .5E-8	<5E-9
NECO	S.E. Creek	<0.02	<1E-6	<7E-8	<2E-8	<9E-9
Sheffield, Ill.	Water Strip Mine	<0.06	<1E-6	<9E-8	<2E-8	<2E-8
	Test Well A	<0.02	<1E-6	<5E-8	<8E-9	<9E-9
	Test Well B	<0.02	<1E-6	<6E-8	<6E-9	<5E-9
	Test Well D	<0.01	<1E-6	<7E-8	<2E-8	<9E-9
	Test Well E	<0.04	<1E-6	<6E-8	<2E-8	<9E-9
	Test Well P	<0.06	<1E-6	<2E-8	<5E-8	<9E-9
NECO	NE-9	<0.07	<1E-6	<6E-8	<2E-8	<9E-9
Beatty, Nev.	NE-10	<0.05	<1E-6	<6E-8	<6E-9	<5E-9
	NE-11	<0.09	<1E-6	<4E-8	<8E-9	<5E-9
NECO	NE-1	<0.05	<1E-6	<9E-8	<2E-8	<2E-8
Ridgeland, Wash.	NE-2	<0.05	<1E-6	<9E-8	<2E-8	<1E-8

*Liquid sample from ditch receiving surface drainage and water from swamp. Previous investigation of elevated tritium levels at this location disclosed most likely source appeared to be seepage from reprocessing plant lagoons and not from burial trenches.

DATE OF DOCUMENT

7/11/75

ACTION COMPLETION DEADLINE

7/25/75

TO

Chairman Anders

ACTION PROCESSING DATES

Acknowledged _____

Interim Reply _____

Final 15/Dec 7/29/75

PREPARE FOR SIGNATURE OF:

Chairman_____
Director of Regulation☒

Omitted

DESCRIPTION

Ltr

☒ Original☐ Copy☐ Other

Fuel ltr to Mrs. Jackie Dwight, Environmental Quality
Commission, Ky., re possibility of a leakage of low level
wastes at Maxey Flats

REMARKS

Return enclosure with reply

Mark envelope to Attn: J. Hill

7/11/75 4:00 pm
7/27/75 9:00 am JWH

SECT 76-0103

REFERRED TO

DATE

IS NOTIFICATION TO THE JCAE

Chapman f/action

7/21/75

RECOMMENDED? _____

MF

"

7/21/75

Cys: _____

Nussbaum/Kerr

Rec 7/21/75
5:00 PM

DIRECTOR OF REGULATION
COMMUNICATIONS CONTROL

Form HQ-32 (1-73)
USAEC

NRC SECRETARIAT

TO:

- ☐ Commissioner
☒ Exec. Dir./Oper.
☐ Cong. Liaison
☐ Public Affairs
☐

Date 7/21/75

- ☐ Gen. Counsel
☐ Solicitor
☐ Secretary

Incoming: John B. Breckinridge

From: House of Representatives

To: Chairman Anders

Date 7/11/75

Subject: Ltr fm Mrs. Jackie Swigart, Environmental
Quality Commission dtd 5/17/75 re Report on leakage of
low level radioactive waste in Maxie Flats, Kentucky

☐ Prepare reply for signature of:

☐ Chairman☐ Commissioner☐ EDO, GC, CL, SOL, PA, SECY

☐ Signature block omitted

☐☐ Return original of incoming with response

☒ For direct reply*

☐ For appropriate action☐ For information☐ For recommendation

Rec'd Off. Dir.

Date 7/21/70

Time 2:22

SUSPENSE DATE: 7/28/75

Remarks: Cy of incoming to Chairman Anders, OCA & PA
OCA to prepare acknowledgement.

Please note request to return correspondence

RF

For the Commission:

*Send three (3) copies of reply to Secy Mail Facility

Congress of the United States

House of Representatives

Washington, D.C.

July 11, 19 75
Mr. William Anders, Chairman
Nuclear Regulatory Commission
1717 H Street, N.W.
Washington, D. C. 20555

Sir:

The attached communication
is sent for your consideration.
Please investigate the statements
contained therein and forward me
the necessary information for re-
ply, returning the enclosed corre-
spondence with your answer.

Yours truly,

John B. Breckinridge

JOHN B. BRECKINRIDGE, M. C.

Report on leakage of low level
radioactive waste in Maxie Flats,
Kentucky

(Return to J. Hill, 125 Cannon
HOB, Wash., D.C. 20515)

530



Julian Carroll

GOVERNOR

all day

COMMONWEALTH OF KENTUCKY

ENVIRONMENTAL QUALITY COMMISSION

May 17, 1975

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436-4972 (RES.)

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765-5941 (OFC.)

The Honorable John B. Breckinridge
U. S. House of Representatives
125 Cannon House Office Bldg.
Washington, D.C. 20515

Dear John:

Two things recently have made me think of you. One, the state of Kentucky has just reviewed the air pollution regulations we wrote years back and the arguments were as numerous and vocal as they were at that time.

Secondly, the EQC has become involved in the Maxey Flats issue about which I understand you are knowledgeable. There is some concern on the part of credible scientists that there could be a leakage of low level radioactive wastes into the burial trenches.

I would appreciate any information you might have on this subject. It is my understanding the site was created to encourage the atomic energy industry to come to Kentucky which has never happened. Presently, 99% of the wastes come from out of state which makes us a dumping ground.

More specifically, do you know how I can obtain a copy of a GAO survey of low level radioactive wastes done in 1974 that was part of a larger study commissioned by the old AEC? I have tried in vain to find out if this was ever published.

Any information you could furnish that is of historical value would be greatly appreciated. You also might be interested in knowing the Governor is considering abolishing the Science and Technology Commission which has not functioned the way it was envisioned.