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To: Dean Meyer, Group Leader, H-1
From: John Enders, H-1
Subject: ANNUAL REPORT FOR 1959 ON DISPOSAL OF SOLID RADIOACTIVE WASTE

General:

This report is a general review of disposal activities for 1959. The data sheets attached to this report show the volume and costs by calendar quarter. A comparative summary is also included. A separate fourth quarter report is not made as the data and information has been included into this report.

Information for this report was furnished by The Zia Refuse Dept., ENG-4, SP-2 and LA Notebook #9593 (current dump run logbook). The data reported is as accurate as possible, but in several cases approximations were made. This should be born in mind if any conclusions from this report are to be made.

During the year there have been several non-routine disposal operations. Because they were non-routine they are not included in the comparative data. However, since the disposal of contaminated material was involved it would be proper to report these jobs in order to avoid a false conclusion as to overall costs.

Packaging Trash:

As reported in the 1958 annual report a start was made in the use of 5 mil plastic bags as containers for contaminated trash at the CMR Bld. and Sigma Bld. During 1959 trash dollies (for holding and transporting the plastic bags) and plastic bags were supplied to several other sites for use and evaluation. It is believed that during the next year a definite increase will be made in the use of plastic bags as contaminated trash containers.

A sealer is being investigated for use in sealing plastic sheeting that would provide a means for packaging odd shaped items during transit either to decontamination or to the disposal pit. If acquired, the sealer should be made available for the entire group for use as needed.

Cardboard boxes located in the utility corridors of the CMR Bld. laboratory wings are being replaced with metal cans provided with a plastic bag liner. The changeover was made in order to provide a more fireproof container for solid radioactive waste.

The charge for packaging contaminated trash is still the largest single cost item. Improvement in this job by increased use of plastic bags and of handling techniques are anticipated for next year. A time study was made by Pascual Chavez, H-1, and Don Rice, Zia Tech Janitorial Office, in 1958 and reviewed in 1959. Although there was a slight increase in janitorial wages the increase was not enough to change the charge for this work.

Transportation of contaminated trash:

Dempster Dumpster trucks using skip-type containers began to haul the 55 gal. drums of sludge from TA-45 and Bld. 35, DPW, in March of this year. Prior to this date these drums had been transported by truck. A study was made comparing the two methods of transportation and the results indicated that it cost about \$1.20 per drum when Dempster Dumpster trucks were used and \$2.50 when the hauling was done by truck.

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Loose, slightly contaminated material, government property and some boxed trash is still being hauled to the disposal pit by truck. Whenever possible, the cost of these jobs are shown on the data sheet. In the future the job order number for these special hauling jobs will be logged into the logbook so as to permit more accurate estimation of costs on disposal of non-routine contaminated material.

Some thought should be given as to the acquisition of another skip type Dempster Dumpster container for use in hauling drums filled with TU chips from the Shops area to pit #5, Area "C". Recently 557 drums were taken to pit #5, Area "C", by the Zia Riggers from the Shops area. It is believed that these drums could be hauled more economically by Dempster Dumpster trucks using skip-type containers.

Beta-Gamma waste disposal:

Early this year the Dempster Dumpster trucks began to experience trouble in picking up the 10 cubic yard boxes used at Bayo Site. The boxes were being overloaded. The problem was solved by exchanging these containers for four cubic yard boxes. The Bayo boxes were then decontaminated, repainted and put into use at the Administration building.

Several sites (10 site, DP West, TA-48, and TA-46) have used the disposal holes located between pits #4 and 5, Area "C", for their gamma active waste material. This fall the 12th hole was filled and an order was placed to drill 55 more holes between pits #1 and 3, Area "C". These additional holes should provide space for the next two years. Metal stakes with numbered tags have been placed next to each hole as permanent markers. Each delivery made to these disposal holes is logged into the logbook # 9593.

This year 10-site personnel modified the equipment used for containing and shielding their waste material during transit to the disposal area. This modification included an improved container and a Tuballoy cask that is provided with a trap door in the bottom that permits dropping the waste material (sealed in the cannister) from the cask directly into the disposal well through a hole in the truck bed. This design improvement has permitted handling of wastes that range up to 400 curies of activity with very little personnel exposure. GMS-11 (DP West) has plans to use this equipment when possible for their waste disposal from the hot cells.

In the near future it may be necessary to dig a trench in Area "C" for use by N division for disposal and/or storage of irradiated samples. Another trench may be required in Area "C" for disposal of bulky gamma active material that will not fit into the disposal wells in Area "C".

Disposal Areas

Area "C":

Pit #6 stopped receiving routine boxed trash at the first of this year. During the first 3 quarters this pit received non-routine material until filled. A dirt cover ranging from 3 feet to 6 feet in depth was put on the pit this fall. At a later date it is hoped the dirt cover can be rounded so as to promote water drainage away from the pit.

This pit had been used from February, 1956 until September, 1959. From trash volume records an estimated $2\frac{1}{2}$ cubic yards of fill dirt were required to cover one cubic yard of trash. An estimated 10,000 cubic yards of trash was placed in this pit.

Pit #5 is now being held in reserve for receiving drums of TU chips from the Shops area. The pit could be filled in about one year from now. Although pit #5 is filling at a rapid rate and pit #6 is now filled, a cost write-off will continue in order to retire fencing costs and other charges that may occur in this area.

The unused portion of Area "C" has been turned over to the Safety Group for use in disposal of hazardous chemicals. A fence has been installed along a north-south line so as to isolate this land from the rest of the area.

Area "G"

Pit #1:

This pit began to receive routine trash at the first of this year. Because so much non-routine bulky material had been put into the pit it probably will be filled late in 1960. As of December, 1959, there were 3 layers of routine trash in the pit.

Chain-link type fencing has now been extended so as to completely surround the area. Signs have been placed at about 50 foot intervals on the fence. These signs are identical to those on fences around other areas.

Numbered signs were placed on the fence posts along the west side of pit #1 for use as reference numbers when logging in trash deliveries into the logbook. The signs were purchased by Eng-4 and installed by H-1.

Pit #2:

The excavation of this pit was completed in February, 1959. At the present time it has only 14 large metal boxes (from DP West dump) in it. These boxes occupy about 100 cubic yards of pit space.

The U.S.G.S. has a large water tank installed on the south side of the pit. They are conducting experiments on water transport and will probably continue their work another year or two. At present, their work has not interfered with trash disposal in this area.

Documentation of Trash Disposal:

A paper entitled "Solid Radioactive Waste Disposal at Los Alamos" was presented at the annual meeting of the American Industrial Hygiene Association at Chicago in April. This paper has been submitted for publication in the "American Industrial Hygiene Association Journal". A micro-film (AEC-4130) has been made of this paper which was authored by John Enders. (copy enclosed)
T.L.S.

Explanation of volume and cost data:

Boxes:

These boxes cost 19¢ each. $6,463 \times 19¢ = \$1,227.00$ which is the cost for the fourth quarter. For 1959 the total cost for boxes equaled \$4,763.00. The boxes occupy a volume of 0.087 cubic yards so the volume of boxes for the fourth quarter would be 562 cubic yards and for the year the total would be 2,192 cubic yards.

55 Gal. Drums:

The estimated cost per drum is \$2.60 each. During the 4th quarter 284 drums were taken to the pit. The total cost for the 4th quarter would be \$738.00 and for the entire year \$2,001.00. The volume per drum equals 0.368 cubic yards. The fourth quarter total equals 104 cubic yards and for the year the total is 282 cubic yards.

5 mil Plastic Bags: (13"X13"X24")

These bags cost 14¢ each. 936 were used during the fourth quarter at a cost of \$131.00. The annual cost = \$492.00. The volume per bag is 0.037 yds.³. The annual volume = 131 yd. and the 4th. quarter volume = 35 yd.

5 mil Plastic Bags:(21"X26"X40")

The cost per bag is 51¢ each. 590bags X 51¢=\$231.00 which is the cost for the fourth quarter. The total for the year is \$1,283.00. The volume per bag is 0.46 cubic yards. The volume for the 4th. quarter is 277 cubic yards and for the year it equals 1,218 cubic yards.

Miscellaneous Material:

Only an estimate can be given of the volume of this material. One truckload is estimated at 10 cubic yards. Small items are estimated on an individual basis.

2 inch masking tape:

This tape is used to seal boxes and plastic bags. An estimated 10 feet is used for sealing boxes and 2 feet are needed for plastic bags. Other uses include use as a fastener to seal Kraft paper to floors and on coveralls during work requiring pressure suits. At 64¢ per roll, 400 rolls would cost \$256.00 for the fourth quarter and \$1,024.00 for the year(1,600 rolls).

Trash pickup by Zia Laborers:

This work is now done by job request only. The charges include wages and overhead.

Trash pickup by Dempster Dumpster:

Routine boxed trash is now being hauled by these trucks operated by the Zia Refuse Department. A log of the mileage is kept and a cost per mile is given by the Zia Accounting Department. The total miles logged times the cost per mile plus a 7% G&A overhead is the method used to compute total quarter and annual costs. The 55 gal. sludge drums from TA-45 and Bld. 35, DFW, are now being hauled by Dempster Dumpster trucks using skip-type boxes. The charges for hauling the drums is based on the same method used for trash boxes. A separate mileage log is kept for the 55 gal. drums.

Packaging contaminated trash:

This charge is based on an estimate made as a result of a time study made by Pascual Chavez, H-1, and Don Rice, Zia Tech Janitorial Supervisor. The time spent per day per man for this work is about one hour. Wages and overhead are included in the charge.

H-1 Monitor:

An estimated 200 manhours per quarter is used to perform necessary escort duties as well as admitting Dempster Dumpster trucks into the disposal pit. Overhead plus wages are included in this charge. The figure that has been used for this year is \$4.35 per hour.

H-1 vehicles:

½ ton Chev. pickup(#0325) is used for escort duties and for transportation to and from the disposal pits. For the past two quarters a flat monthly charge of \$40.00 has been made.

One ton, Ford truck, #0967, was transferred from the Zia Company to H-1 group early this year. The charge per month now is the same as for the pickup(\$40.00 per month).

Covering exposed trash:

These charges include wages, maintenance and overhead. The work is done by job order request to the Zia Roads Department.

D-7 Dozer:

A flat \$150.00 per month is now being charged for this tractor.

Fencing-Area "G":

½ of 1/10 per year of original cost(\$6,040.00) is the cost write off rate. This amounts to \$151.00 per quarter or \$938.00 per year. The balance as of 12/31/59 equals \$4,932.00.

Protective Clothing:

This charge is based on an estimate. Protective clothing is worn by personnel covering exposed trash at the disposal pit, by Zia Laborers while hauling contaminated trash and by Zia Janitors when packaging trash.

Road and Ruin Excavation:

When Mesita del Buey mesa was opened for use as a disposal area a two mile gravel road was built and several Indian Ruins were excavated. The total cost of this work(\$10,872.00) is being written off at the rate of 1/20 per year(\$543.00). The charge per quarter amounts to \$135.00. The balance as of 12/31/59 was \$9,786.00.

Excavation of Pit #1, Area "G":

The original cost(\$12,571.00) is being retired at the rate of 1/8 per quarter(\$393.00). The balance as of 12/31/59 equals \$1,961.00.

Area "C" charges:

1. Fencing(1/10 per year=\$97.00/quarter); Balance as of 12/31/59=\$2,327.00
2. Install chain-link type fencing along the west end of Area "C". This work was done by job request. The cost for this work was \$449.00.
3. Drill 55 holes for gamma active waste disposal between pits #1 and 3. This work was done by job request to the Zia Roads Dept. and cost \$898.00 *
4. Deliver 557 drums from Ships area to pit #5. This work was done by the Zia Riggers on a job request. The charge totaled \$1,098.00.
5. Pit #6 was completely covered during the last quarter of 1959. The job cost \$862.00

The total amount expended in Area "C" was \$3,404.00 for 1959. An attempt was made to determine other non-routine costs for delivery of non-routine contaminated material to Pit #6, but this was not possible as many of the job charges were made to individual groups and included in with other work. In 1960 it is hoped that the individual work order or job order numbers may be logged into the IA notebook used for trash disposal so that specific costs may be determined more accurately.

J. Euders, H-1

cc: Dean Meyer, H-1 ✓
Chas. Reynolds, ENG-4

Routine Trash Disposal
Area "G", pit #1

1959

Costs:	1st. qtr.	2nd. qtr.	3rd. qtr.	4th. qtr.	Total
1. Boxes	\$1,211.00	1,105.00	1,220.00	1,227.00	\$4,763.00
2. Drums	304.00	535.00	424.00	738.00	2,001.00
3. Plastic Bags, Lg.	382.00	361.00	309.00	231.00	1,283.00
4. Plastic Bags, Sm.	108.00	117.00	136.00	131.00	492.00
5. Masking Tape	256.00	256.00	256.00	256.00	1,024.00
6. Pickup Trash, Zia	833.00	750.00	215.00	656.00	2,454.00
7. Boxed Trash, D.D.	1,761.00	1,809.00	2,248.00	1,980.00	7,798.00
8. Packaging Trash	7,535.00	7,535.00	7,535.00	7,535.00	30,140.00
9. H-1 Monitor	870.00	870.00	870.00	870.00	3,480.00
10. H-1 Vehicle, #0325	100.00	90.00	120.00	120.00	430.00
11. H-1 Vehicle, #0967	43.00	51.00	120.00	120.00	334.00
12. Covering Trash	570.00		633.00	881.00	2,084.00
13. D-7 Doser Rental	64.00	100.00	450.00	450.00	1,064.00
14. Fencing, Area "G"	151.00	151.00	151.00	151.00	604.00
15. Protective Clothing	50.00	50.00	50.00	50.00	200.00
16. Road & Ruin Charge	135.00	135.00	135.00	135.00	540.00
17. Pit#1, Excavation	393.00	393.00	393.00	393.00	1,572.00
18. Numbered Signs, Pit#1		93.00			93.00
19. Pickup Sludge Drums		260.00	204.00	366.00	830.00
20. Area "G" Fence Extension			615.00		615.00
21. Deliver boxes to Pit#2 (See #6) from DPW Dump (Area "B")					
Totals:	\$14,766.00	\$14,661.00	\$16,084.00	\$16,290.00	\$61,801.00

Packaging Material :

1. # of Boxes	6,378	5,820	6,422	6,463	25,083
2. # of Drums	117	206	163	234	770
3. # of Plastic Bags, Lg.	750	703	607	590	2,655
4. # of " " , Sm.	774	842	976	936	3,528
5. # rolls masking tape	400	400	400	400	1,600

Trash Volume (Yds.³) :

1. Boxes	555	506	569	562	2,192
2. Drums	43	75	60	104	282
3. Bags, Lg., Plastic	353	333	285	277	1,248
4. Bags, Sm., "	29	31	36	35	131
5. Misc. Material	145	190	150	500	985
Totals:	1,125	1,135	1,100	1,478	4,838

Cost per cubic yard: \$13.00 \$13.00 \$14.00 \$11.00 \$13.00

Trash volume (yds. ³):	1956	1957	1958	1959	
	2,537	3,164	3,459	4,838	
Total cost :	\$71,745.00	75,548.00	61,800.00	\$61,801.00	
Cost per Yd. ³ :	\$ 28.00	24.00	18.00	\$13.00	