

RESOLUTION NO. R-84- 3

WHEREAS, the City of Conway Sanitation Department is in need of a dump truck to be used at the Landfill; and

WHEREAS, it has been discussed and decided to purchase a used dump truck for use at the Landfill; and

WHEREAS, the dump truck to be purchased must meet the following minimum specifications: not older than 1975 Mack, twin-screw, 5 or 6 speed, 10 or 12 yd dump.

WHEREAS, the Council hereby waives the competitive bidding process in order to purchase said vehicle.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF CONWAY, ARKANSAS: That the bid process is hereby waived in order to purchase a used dump truck meeting the above mentioned minimum specifications at which time funds will be appropriated for said purchase.

PASSED this 14th day of February, 1984.

APPROVED:

  
\_\_\_\_\_  
Mayor

ATTEST:

  
\_\_\_\_\_  
City Clerk

## CITY OF CONWAY - WASTE MANAGEMENT STUDY

### Introduction

This study consists of three parts - sanitary landfill evaluation, City collection system evaluation, and evaluation of energy production from the solid wastestream of the area.

### PART 1 - LANDFILL EVALUATION

#### 1.0 Methodology

A weighing program was used to measure the amount of waste handled over a period of time at the Conway landfill. The wasteload was also classified by types and sources of waste. Waste types used correspond generally to those used in a previous weighing program conducted in 1982 by the Arkansas Energy Office (AEO). The categories include residential (R), commercial (C), industrial-combustible (I-C), industrial-noncombustible (I-NC), and noncombustible (NC). The NC category includes materials unsuitable for firing in heat recovery systems and consists of wastes from industry, construction/demolition operations, and local business. Loads of brush were not counted or weighed. Personal cars and trucks were only counted.

Field survey cross sections were coordinated with the weighing program. This made possible measurement of the volume of space occupied by compacted wastes and cover material. Field sections were also used to estimate the volume of cover material available at the site's main borrow area.

Data from the weighing program were used in comparison to the data collected previously by the AEO. Factors influencing changes in wastestream quantities were assessed using information on City annexations, industrial trends, and private haulers.

Annual wasteload projections were made using seasonal generation trends observed in other municipal weighing programs. Annual figures, without regard to population growth, were used along with landfill volume measurements to estimate landfill life expectancy.

#### 2.0 Weighing Program

Appendix A contains weight logs obtained during the weighing program. Daily waste deliveries are classified by source and type waste. Figures on private vehicles were also developed and are included in Appendix A. Loads of brush were not weighed and were not included in vehicle counts since brush is not taken to the site's primary disposal area. Car and pickup deliveries are accounted for in projection of life expectancy for the primary landfill area.

The upper table on Page 3 shows waste delivery totals by day of the week for the recent weighing program and the 1982 AEO weighing program. This table shows significant increases in daily waste deliveries since the 1982 program. Sources for the increased wasteload were examined by first compiling daily waste classification data. These data are shown in the lower table on Page 3.

The tables on Page 4 show weekly wasteload breakdowns by type of waste for the 1982 AEO program and the 1983 program. Large increases can be seen in the industrial and noncombustible categories. Smaller, but substantial, increases can also be seen in the residential and commercial categories. The increase in the noncombustible category is not significant since the quantities shown include large amounts of earth, rubble, and construction debris.

The average weekly figures show increases by main category as follows:

Residential:	116.4 Tons/Week	to	160.8 Tons/Week	=	38% Increase
Commercial :	54.6 Tons/Week	to	89.4 Tons/Week	=	64% Increase
Industrial :	146.0 Tons/Week	to	270.0 Tons/Week	=	85% Increase

The increase in the residential category is due to two factors - City annexations and growth which have added approximately 192 accounts since 1982 and appearance of S & H Hauling, a company which services rural residential accounts.

Growth of the commercial part of the wasteload appears to be entirely due to increased collections by City vehicles. This is attributable to the higher level of commercial business activity during the Christmas season. Part of the commercial increase is also probably due to the generally better economic climate than prevailed in the spring of 1982. Generation of commercial wastes is directly related to level of business activity, and large variations in this category can be expected both seasonally and with respect to performance of the local economy.

The largest category increase, excluding noncombustibles such as construction debris, rubble, etc., is in industrial wastes. The increase is attributable to both changes in local manufacturing processes and production increases which, as with commercial wastes, also reflect the generally improved economic situation since spring of 1982.

The table on Page 5 shows waste source deliveries for one week of the recent weighing program as opposed to one week of the 1982 AEO program. The biggest increases in industrial wastes can be seen in deliveries from Virco and Arkansas Waste. Lesser, but significant, increases are also seen in industrial wastes from Univeral Nolin, Tiffany, Vidare, Castle King, Erby, and Lasley.

CITY OF CONWAY

LANDFILL ANALYSIS PROJECT

COMPARISON OF WASTE TOTALS BY DAY - AEO & HF DATA

Includes NC/Excludes Pickups & Brush

	<u>Mon.</u>	<u>Tues.</u>	<u>Wed.</u>	<u>Thurs.</u>	<u>Fri.</u>	<u>Sat.</u>
3/29-4/3, 1982 (AEO)	62.0	62.5	70.7	104.9	38.8	11.0
4/5 -4/10, 1982 (AEO)	56.4	75.3	76.7	68.4	28.3	10.5*
11/28-12/3, 1983 (HF)	120.6*	103.3	123.9	112.8	95.0*	10.0*
12/5 -12/10, 1983 (HF)	133.6	107.8	131.7	114.4	99.4	10.0*
12/12-12/14, 1983 (HF)	107.7	96.3	96.8	----	----	----

\*Denotes Estimated Quantity

WASTE COMPOSITION - HF DATA

Weight in Tons - Includes NC/Excludes Pickups & Brush

<u>Day</u>	<u>R</u>	<u>C</u>	<u>I</u>	<u>NC</u>	<u>Total</u>
11/28* (Estimated)	43.3	20.3	53.8	3.2	120.6
11/29	43.1	11.2	42.8	6.2	103.3
11/30	40.0	10.4	57.7	15.8	123.9
12/1	24.6	22.0	58.3	7.9	112.8
12/2* (Estimated)	34.1	16.0	42.3	2.6	95.0
12/3* (Estimated)	--	4.6	3.4	2.0	10.0
12/5	22.4	20.2	52.8	38.2	133.6
12/6	19.1	13.4	66.1	9.2	107.8
12/7	27.2	26.2	65.5	12.8	131.7
12/8	34.4	16.6	49.3	14.1	114.4
12/9	33.5	13.4	44.7	7.8	99.4
12/10* (Estimated)	--	4.6	3.4	2.0	10.0
12/12	44.6	10.0	40.2	12.9	107.7
12/13	20.0	11.1	59.3	5.9	96.3
12/14	32.2	18.8	40.9	4.9	96.8

CITY OF CONWAY  
LANDFILL ANALYSIS PROJECT

WASTESTREAM COMPOSITION - AEO DATA

Weight in Tons - Includes NC/Excludes Pickups & Brush

	<u>Week Total</u>	<u>R Weight/%</u>	<u>C Weight/%</u>	<u>I Weight/%</u>	<u>NC Weight/%</u>
3/29-4/3, 1982	349.8	118.3/33.8	54.4/15.6	166.5/47.6	10.6/3.0
4/5 -4/10, 1982	301.9	114.5/37.9	54.7/18.1	125.6/41.6	7.1/2.4
Avg. Tons/Week		116.4	54.6	146.0	8.8
Avg. Percent		35.9	16.8	44.6	2.7

WASTESTREAM COMPOSITION - HF DATA

Weight in Tons - Includes NC/Excludes Pickups & Brush

	<u>Week Total</u>	<u>R Weight/%</u>	<u>C Weight/%</u>	<u>I Weight/%</u>	<u>NC Weight/%</u>
11/28-12/3, 1983	565.6	185.1/32.7	84.5/14.9	258.3/45.7	37.7/6.7
12/5 -12/10, 1983	596.9	136.6/22.9	94.4/15.8	281.8/47.2	84.1/14.1
Avg. Tons/Week		160.8	89.4	270.0	60.9
Avg. Percent		27.8	15.4	46.4	10.4

CITY OF CONWAY

LANDFILL ANALYSIS PROJECT

COMPARISON OF WASTES BY SOURCE

1982 AEO VS. 1983 HF DATA

<u>Source</u>	<u>12/5 - 12/9, '83</u> <u>LBS.(NO. LOADS)</u>	<u>4/5 - 4/10, '82</u> <u>LBS.(NO. LOADS)</u>
S-120 (City)	74,700 (8)	73,150 (12)
S-121 (City)	76,900 (7)	30,850 (3)
S-119 (City)	40,400 (8)	29,250 (6)
S-117 (City)	43,400 (4)	38,050 (8)
S-116 (City)	70,900 (10)	50,625 (9)
S-102 (City)	44,700 (7)	35,650 (4)
S-103 (City)	5,000 (4)	1,500 (1)
S-111 (City)	7,800 (1)	2,500 (1)
S-104 (City)	4,000 (1)	1,500 (1)
Virco	107,100 (17)	54,300 (11)
Universal Nolin	37,900 (11)	25,450 (10)
Polyvend	14,400 (7)	10,000 (7)
Arkansas Waste	199,200 (26)	74,050 (7)
Tiffany	19,800 (5)	12,600 (6)
Vidare	14,200 (4)	1,400 (1)
U.C.A.	16,800 (5)	11,150 (4)
Baldwin Piano	2,600 (2)	6,450 (2)
Roach	59,800 (11)	57,550 (8)
Castle King	35,700 (7)	14,900 (3)
Nabholtz	79,800 (11)	4,750 (2)
Erby	25,300 (5)	11,850 (3)
S & H	49,200 (8)	---
Lasley	14,400 (3)	---
Misc. Const. Waste	55,900 (13)	19,550 (5)
Hendrix	---	1,200 (2)
Mid-South	4,700 (1)	3,400 (1)
Misc. Individuals	29,200 (9)	20,100 (8)
Misc. Business & Industry	16,800 (7)	12,950 (6)

### 3.0 Annual Wasteload Projections

The figures shown on Page 7 are derived from past weighing programs in Fort Smith and Texarkana, Arkansas. Table values are ratios of monthly weight totals to the mean monthly weight for each location. These ratios are indications of how waste generation varies from month to month throughout a year. The average values shown in this table were used to project annual waste receipts at the Conway landfill.

Two sets of base data were used in annual projections - AEO data collected in April, 1982, and data collected in December, 1983. Calculations to arrive at monthly totals and mean monthly values for each set of data are shown below. Large amounts of NC materials such as rock, earth, and debris are not included in the calculations.

#### 3.1 AEO Data.

Month of April, 1982

22 Weekdays & 4 Saturdays in April, 1982

Weighing Program Covered 7 Weekdays & 2 Saturdays

$$\frac{22 \text{ Weekdays}}{\text{April, 1982}} \times \frac{448.8 \text{ Tons}}{7 \text{ Weekdays}} + \frac{4 \text{ Saturdays}}{\text{April, 1982}} \times \frac{21.5 \text{ Tons}}{2 \text{ Saturdays}} =$$

1,453.5 Tons, Month of April, 1982

$$\frac{\text{April Weight Value}}{\text{Mean Monthly Value}} = 1.03 \text{ (Month of April)}$$

$$\text{Mean Monthly Value} = 1,411.2 \text{ Tons}$$

#### 3.2 Hodges Firm Data.

Month of December, 1983

22 Weekdays & 5 Saturdays in December, 1983

Weighing Program Covered 10 Weekdays & 2 Saturdays

$$\frac{22 \text{ Weekdays}}{\text{December, 1983}} \times \frac{990.1 \text{ Tons}}{10 \text{ Weekdays}} + \frac{5 \text{ Saturdays}}{\text{December, 1983}} \times \frac{20.0 \text{ Tons}}{2 \text{ Saturdays}} =$$

2,228.2 Tons, Month of December, 1983

$$\frac{\text{December Weight Value}}{\text{Mean Monthly Value}} = 0.975$$

$$\text{Mean Monthly Value} = 2,285.3 \text{ Tons}$$

#### 3.3 Data Comparison & Yearly Projections.

Mean monthly waste generation has increased from 1,411 tons in 1982 to 2,285 tons in late 1983, an increase of approximately 62%. This increase is due mostly to growth in industrial and commercial wasteloads.

The table on Page 9 shows yearly wasteload projections based on the 1982 AEO data and on the 1983 data. The projected yearly total based on the '83 data is used in sections following to estimate remaining landfill life. The more current data represents present consumption rate of the landfill. Should wasteloading fall off due to economic or other circumstances, then remaining landfill life will be longer than projected.

#### 4.0 Compactive Efficiency, December, 1983

Field survey cross sections of the primary work area show that approximately 3,600 cubic yards of landfill volume were consumed by placement of 984 tons of waste. This waste tonnage excludes brush and includes car and pickup deliveries.

A 6" layer of daily cover is required for each 2½'-3' lift of waste. Six inches per 3' lift is equal to a 6:1 waste-to-cover ratio. Using the 6:1 ratio, the 3,600 cubic yards of landfill volume consumed therefore consisted of approximately 514 cubic yards of earth cover and 3,086 cubic yards of compacted waste. These figures yield an average in-place density of approximately 638 pounds per cubic yard. The normal range of in-place landfill density is from 500 to 800 pounds per cubic yard. Densities in the range of 800 to 1200 pounds per cubic yard have, however, been achieved through use of special compactive equipment such as a steel-wheeled roller.

#### 5.0 Volumetric Measurements

##### 5.1 Borrow Area.

Field cross sections show that there is approximately 79,200 cubic yards of potential cover material in the site's primary borrow area. This is an in-place measurement and does not allow for the presence of large rock outcrops or shrinkage. A shrinkage figure of 20% should allow for normal transit losses, compaction, and minor amounts of boulders and larger stones. It should be noted that existence of large rock outcrops at deeper cut elevations is a possibility and could seriously reduce the amount of cover available in the primary borrow area. A 20% shrinkage factor would provide approximately 63,360 cubic yards of daily and possibly final cover application.

The 63,360 net cubic yards of borrow available, at a 6:1 waste-to-cover ratio, would provide daily cover for approximately 380,160 compacted cubic yards of solid waste. Based on the in-place density of 638 pounds per cubic yard achieved in December, 1983, this would provide for disposal of approximately 121,270 tons of waste. These figures, however, are without regard to application of a 2' final cover layer, the dirt volume of which would be dependent on the size area covered.

The large volume of cover available in the primary borrow area plus lesser amounts of borrow available in other locations on-site suggest that the present landfill life expectancy may be more dependent on the remaining volume in the fill area than on availability of cover material.

CITY OF CONWAY  
LANDFILL ANALYSIS PROJECT

YEARLY WASTELOAD PROJECTIONS  
FOR  
CITY OF CONWAY

<u>Month</u>	Mean = 1,411.2 Tons Monthly Weights Based on '82 Data	Mean = 2,285.3 Tons Monthly Weights Based on '83 Data
January	1,284	2,080
February	1,242	2,011
March	1,468	2,377
April	1,454	2,354
May	1,503	2,434
June	1,496	2,422
July	1,418	2,297
August	1,531	2,480
September	1,383	2,240
October	1,369	2,217
November	1,397	2,262
December	<u>1,376</u>	<u>2,228</u>
Yearly Totals	16,921 Tons	27,402 Tons

Overall Wastestream Increase                      62% (Seasonally Adjusted)

## 5.2 Primary Landfill Area.

The drawing of Appendix B shows one possible set of finish contours for the primary fill area. These contours would mean raising of the existing work area elevation by about 35' at the deepest point.

Volumetric calculations shown that the finish contours of Appendix B would represent additional filling of approximately 180,830 cubic yards. At a 6:1 waste-to-daily cover ratio, this figure would represent approximately 25,830 cubic yards of daily cover and 155,000 cubic yards of compacted waste. Using the in-place density achieved in December, 1983, this waste volume is equivalent to roughly 49,445 tons of solid waste. Cover material requirement for this volume would include the 25,830 cubic yards of daily cover plus 25,870 cubic yards for the 2' final cover for a total of 51,700 cubic yards of borrow. This figure compares to the 63,360 net cubic yards of material which may be available in the primary borrow area.

## 6.0 Life Expectancy Projection

Based on the finish contours of Appendix B, the primary work area can accept approximately 49,445 tons of solid waste. Based on the observed wasteloading of December, 1983, and annual projections based thereon, the landfill can expect to receive roughly 27,400 tons of waste per year, exclusive of brush and additional population growth. These figures yield a remaining life expectancy of approximately 1.80 years or about 22 months.