

Recycling Program Report

A.R.S. §49-832.C

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Recycling Program Report

A.R.S. §49-832. C

Acknowledgments

The 1990 Arizona Solid Waste Recycling Act, through A.R.S. §49-837. D. , established a committee to advise the Arizona Department of Environmental Quality's (ADEQ) director on the use of the recycling fund. The Arizona Recycling Advisory Committee consists of two representatives from private solid waste haulers, two representatives from private solid waste recycling business, four representatives from political subdivisions that have implemented recycling and sources reduction programs, at least one of whom resides in a county having a population of fewer than 500,000 persons and one representative of the general public. The nine members of this committee are appointed by the director, and four positions are currently vacant.

We would like to acknowledge the support, commitment and hard work of the following Arizona Recycling Advisory Committee members who provide invaluable support to the director and the Arizona Recycling Program staff.

Fiscal Year 2001 Arizona Recycling Advisory Committee

Mr. Mark Wingfield
Chairperson
Plant Manager
Poly Tek Southwest
Queen Creek, Arizona

Ms. Kay Dyson
Parks and Recreation Director
Town of Eagar
Eagar, Arizona

Mr. Brian Conway
General Manager
River Cities Waste Service
Lake Havasu City, Arizona

Mr. Michael Hoyt
Field Operations Director
City of Glendale
Glendale, Arizona

Ms. Mary Dahl
Community Development Director
La Paz County
Parker, Arizona

Arizona Recycling Program Staff

The 1990 Arizona Solid Waste Recycling Act established the Arizona Recycling Program as part of ADEQ. The Arizona Recycling Program is funded through disposal fees collected at solid waste landfills. As outlined in A.R.S. §49-837, the program's responsibilities include distribution and administration of project

funding. The recycling program offers two funding programs: the Waste Reduction Assistance (WRA) Program and the Waste Reduction Initiative Through Education (WRITE) Program. In addition, the program conducts public education, technical assistance and outreach events. The Arizona Recycling Program also partners with the Arizona Department of Commerce to attract recycling-related companies to the state, keeping the economic benefits of recycling in Arizona.

The Arizona Recycling Program team members consist of six ADEQ employees and a representative from the Arizona Department of Commerce.

Tammy Shreeve is the manager of the Recycling and Data Management Unit and is responsible for the administrative functions of the program. Tammy can be contacted at tas@ev.state.az.us or (602) 207-4171.

Gloria Harmon is the Arizona Recycling Program's administrative secretary and can be contacted for general recycling information at gmh@ev.state.az.us or (602) 207-4133.

David Janke is the recycling statistical analyst coordinator. He oversees the collection and compilation of statistical data pertaining to solid waste recycling and disposal. He can be contacted at drj@ev.state.az.us or (602) 207-4173.

Jackie Hosier is the recycling information coordinator. She manages promotional projects, such as the Arizona Recycling Program's quarterly newsletter, annual report, brochures and other informational materials. Jackie also coordinates the Arizona Recycling Program's statewide recycling awareness campaigns. She can be contacted at jah@ev.state.az.us or (602) 207-4134.

Cathy Charney is the Waste Reduction Assistance Program coordinator. She also administers the Arizona Recycling Program's composting and special waste programs. Cathy can be contacted at cjb@ev.state.az.us or (602) 207-4170.

Tori Shaw is the Waste Reduction Initiative Through Education Program coordinator. She manages the Arizona Recycling Program's education projects. Tori can be contacted at ts4@ev.state.az.us or (602) 207-4865.

Mitra Khazai is the recycling market development manager at the Arizona Department of Commerce. Mitra is responsible for the administrative duties of the Recycling Market Development Program. She can be contacted at mitrak@azcommerce.com or (602) 280-1398.

The Arizona Recycling Program staff can also be reached toll free in Arizona at (800) 234-5677 by using the last four digits of each staff member's phone number

as the extension. The Arizona Recycling Program's Web page can be accessed at www.adeq.state.az.us/environ/waste/solid/recycle.html.

Introduction

The Arizona Department of Environmental Quality established the Arizona Recycling Program to implement A.R.S. §49-831, which became effective in September 1990. The statute created a multifaceted solid waste reduction program that requires specific types of information and recommendations to be included in the Arizona Recycling Program's annual report. Some of the topics discussed in the report include waste stream components analysis, recycling volumes and programs, costs and revenues, funding programs, public education, recycling market development, used motor oil, recycling opportunities, impediments and disincentives, and newsprint. This report covers fiscal year 2001, which was from July 1, 2000 to June 30, 2001.

The information in this report concerning the public sector's recycling efforts was gathered through the annual recycling and waste reduction questionnaire that is distributed to all jurisdictions within the state. A private sector survey, conducted in cooperation with the Arizona Department of Commerce's Recycling Market Development Program, was distributed to all known private recycling companies, non-profit organizations and landfills. **At the time of this report's printing, data from the private and public sectors had not been fully received and compiled. Data compilation was completed in November 2001.** Updates will be posted on the Arizona Recycling Program's Web page at www.adeq.state.az.us/environ/waste/solid/recycle.html.

The following is a summary of the FY 2001 highlights:

- , Since the Arizona Recycling Program's inception in 1990, it has provided more than \$8.2 million in project funding. Public jurisdictions received funding for 86 projects, the private sector (businesses and organizations) received funding for 63 projects, 56 nonprofit organization projects were funded and universities and colleges received funding for 12 projects; a total of 217 projects received funding from the program.
- , The Arizona Recycling Program co-sponsored many educational workshops and outreach events, including the Southwest Public Recycling Association's *Recycling Coordinators' Training Workshops*, Northern Arizona University's *Protective Circles II: The Teachers Workshop*, the Navajo Nation's *Solid Waste Management Program Recycling Workshop* and the Students Recycling Used Technology (StRUT) Earth Day computer recycling collection event.
- , Information about the Arizona Recycling Program's efforts to verify that the consumers of newsprint in Arizona were in compliance with

the newsprint statute (A.R.S. §49-834) for FY 2001 is included in this year's report. It includes the survey methodologies and results from this year's survey.

In an effort to save our valuable resources, the Arizona Recycling Program has reduced the list of funded projects, which begins on Page 76 to only list projects awarded during FY 2001. To request information about previously-funded projects, please contact the Arizona Recycling Program at (602) 207-4133 or, toll free in Arizona, (800) 234-5677, Ext. 4133. The Arizona Recycling Program is in the process of developing an online list of previously-funded projects. The list will include project title, summary, funding amount and funding program. The list will be available after June 2002 at www.adeq.state.az.us/enviro/waste/solid/recycle.html.

Waste Stream Components Analysis

The Arizona Solid Waste Recycling Act (A.R.S. §49-832. C.3.) requires this annual report to include an analysis of the various components of the waste stream and to propose changes that will conserve energy and reduce solid waste generation. Studies have been completed that analyze specific Arizona municipal and regional waste streams (see the list of project funded resources beginning on Page 120 for a list of waste streams studies available from the recycling program). Each study provides a clear indication of the waste stream components within its specific governmental jurisdiction, and indicate that each jurisdiction has a unique waste stream. The differences between waste streams and the span of years in which the studies took place make it difficult to extrapolate these studies to a statewide level. In addition, the studies do not provide information needed to evaluate the waste streams collected by private sector haulers. However, the Arizona Recycling Program awarded Waste Reduction Assistance Research and Development funding (see Page 74 for information about this funding) to the Southwest Public Recycling Association (SPRA) to compile waste stream analysis data for representative rural communities across the state. SPRA has subcontracted the work to the Garbage Project at the University of Arizona. The university has produced a report that is a comprehensive waste stream analysis for the state. The report is currently under review. Once the review is complete, SPRA will combine the data with the aforementioned waste stream analysis studies to develop a complete and fairly accurate picture of waste streams in Arizona, both locally and for the state as a whole.

The recycling program has data available concerning the total amount of solid waste disposed of in landfills (for a list of active landfills and the tonnage accepted, see Table 12, which begins on Page 115). The information is derived through landfill disposal fees. These data, along with information provided by local governmental jurisdictions within Arizona and national studies of waste

composition, are the basis for the development of general waste management strategies.

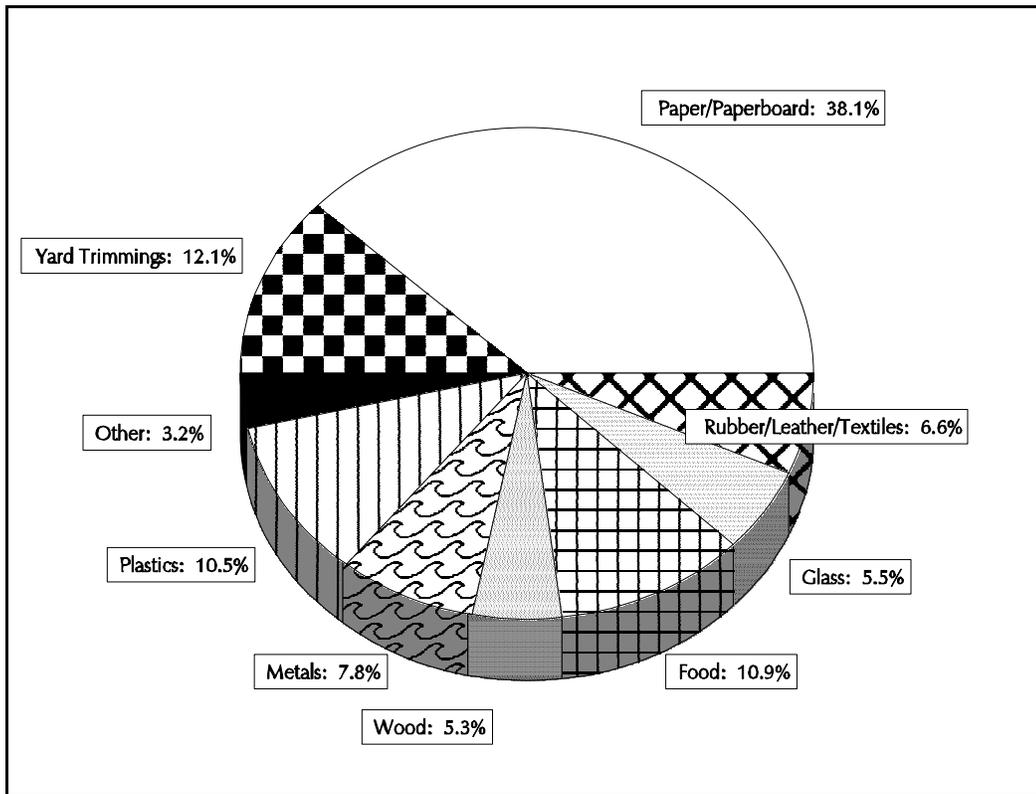


Figure 1. The components of the municipal solid waste stream for the United States for the 1999 calendar year. The total weight of the national municipal solid waste generated during that year was 229,900,000 tons.

Characteristics of the National Waste Stream

The United States Environmental Protection Agency (EPA) provides results of studies analyzing the characteristics of the municipal solid waste stream for the United States in the 1999 calendar year. This study, entitled *Municipal Waste Generations, Recycling and Disposal in the United States: Facts and Figures for 1999*, can be downloaded from www.epa.gov/garbage/mswfinal.pdf. A breakdown of the national municipal solid waste stream is illustrated in Figure 1. A total of 229.9 million tons of municipal solid waste was generated in 1999. This is an increase of 6.9 million tons from 1998. This is the third straight year of an increase after two consecutive years of decreases. The amount of waste generated per person per day increased to 4.62 pounds from 4.52 pounds in 1998.

Defining the Total Solid Waste Stream

For the purpose of defining recycling rates and diversion rates for Arizona and local jurisdictions, the total solid waste stream is composed of the municipal and non-municipal solid waste streams.

EPA defines municipal solid waste (MSW) as wastes such as durable goods, non-durable goods, containers and packaging, food scraps, yard trimmings and miscellaneous inorganic wastes from residential, commercial, institutional and industrial solid waste sources (Ibid.). Public concern relating to solid waste management tends to focus on this portion of the solid waste stream as it is the only portion that can be influenced directly from the home, business or office. Recycling rates are based solely on materials recycled from MSW. The full waste stream produced by the United States includes heavy industrial and commercial wastes. These are considered non-municipal solid waste and constitute a significant portion of the waste stream. Examples of non-municipal solid waste include construction and demolition debris, automobile bodies, municipal sludge, combustion ash and industrial process wastes that might be disposed of in non-MSW landfills. This report will attempt to separate information concerning MSW from the remainder of the waste stream where possible. This will allow the determination of a recycling rate based solely on the amount of MSW recycled. It will also allow the determination of a diversion rate based on the entire waste stream and the total amount of all waste recycled. Both the recycling rate and the diversion rate will be updated on the Arizona Recycling Program's Web page as data continue to be collected. The address to view these updates is www.adeq.state.az.us/environ/waste/solid/recycling.html.

Solid Waste Reduction and Energy Conservation

The efforts that the recycling program recommends to enhance source reduction and energy conservation are the same as last year: buying recycled content products and encouraging backyard composting.

Buying recycled content products creates a demand for materials collected in recycling programs. This not only reduces the amount of waste landfilled, but also significantly reduces the energy needed to produce the new products. Paper is a good example.

According to Figure 1, paper products compose approximately 38.1 percent of the waste stream. Recycled-content paper is readily available and performs as well as virgin paper products in computer printers, copying machines and printing presses. Buying paper made with recycled content stimulates markets producing these products. This stimulation is transmitted back through the recycling loop, increasing production of recycled content paper which increases the collection of waste papers for recycling. This is a closed loop in Arizona for old newspaper, which is used as a feedstock at Abitibi Consolidated, Inc. in Snowflake, Ariz. to

produce newsprint. Likewise, industrial paper waste is used by Wisconsin Tissue in Flagstaff, Ariz. to produce recycled-content tissue products.

In addition, the energy savings inherent in this process are significant. The amount of energy saved by recycling waste paper is equivalent to 4,100 kilowatts per ton, according to Wisconsin Tissue's *Environmental Evaluator*, 1991. This type of savings occurs for almost every material. Producing aluminum from used beverage containers (UBCs) saves 95 percent of the energy that using bauxite ore would consume. Producing a glass container from recycled glass (cullet) saves enough energy to light a 100 watt light for four hours.

The recycling program promotes buying recycled products (see Page 86 for details on these promotions). The recycling program and the Arizona Department of Commerce have sponsored three *Arizona Buy Recycled Expos*. The expos were produced by the Arizona Recycling Coalition and the Southwest Public Recycling Association. In addition, buying recycled content products were a major focus of recycling conferences sponsored by the recycling program and The Arizona Department of Commerce including the *Arizona Recycling Coalition First Annual Conference* and the *Southwest Public Recycling Association's Southwest Recycling Market Development Conference*.

Backyard composting is a direct way individual residents can practice source reduction. Second only to paper, yard trimmings represent 12.1 percent of the municipal solid waste stream. Therefore, backyard composting programs have the potential to significantly reduce the waste stream. In addition, by reducing waste at its source, the energy used to transport and process and/or dispose of the material is saved. Because of their decentralized nature, backyard composting programs are extremely hard to track. Therefore, any waste reduction and energy savings produced by the programs have not been quantified. There are many backyard composting programs sponsored by individual jurisdictions within the state.

Legislative Mandates for Waste Reduction

The intent of the Arizona State Legislature in passing the Recycling Act in 1990 was to give Arizona residents the opportunity to recycle. Many local governmental jurisdictions provide a variety of recycling opportunities. During the fall of 1997, discussions were held with recycling and waste disposal stakeholders pertaining to setting a non-mandated state recycling goal. However, feedback from these discussions indicated that a recycling goal was not a priority.

Since Arizona has low landfill disposal fees, as compared to other states, and still has potential land for future landfills, recycling costs in many areas of the state are greater than the cost to dispose of materials. State demographics indicate that many jurisdictions with sparse populations, or those located great distances from

recycling markets, have difficulty initiating and maintaining successful recycling programs. To assist small communities, the recycling program targets their residents and encourages them to recycle. Educational materials, technical assistance, funding opportunities and seminars are provided to help find alternatives that will reduce the solid waste streams entering their landfills for disposal. To insure that small and rural communities receive assistance with providing their residents recycling opportunities, the recycling program, during FY 2001, restructured the WRA funding program to stress the establishment of drop-off recycling programs in communities that had no public recycling opportunities offered. In addition, the maximum amount of funding a public jurisdiction was allowed to request was increased from \$100,000 to \$200,000. The results of these changes will be discussed in the recycling program's 2002 annual report.

Feedback from small community stakeholders suggests that mandating recycling in Arizona at this time could be counterproductive. It would require cities and towns with scant financial resources to initiate recycling programs having capital costs and transportation costs that, alone, make recycling economically burdensome. The voluntary approach has resulted in small communities making incremental strides, within their means, to create or expand sustainable recycling programs. The recycling program has been instrumental in assisting such small community programs.

Recycling Volumes and Programs

The Arizona Recycling Statute (A.R.S. §49-832. C.2.) requires that the volume of material recycled during the preceding year be reported annually. This section reports preliminary figures for FY 2001. Information reported in this section includes:

- , The jurisdictions that responded at the time of this report to the distributed questionnaires.
- , The materials recycled and/or diverted by each individual jurisdiction that responded to the distributed questionnaires at this time.
- , The growth of curbside recycling.

The annual waste reduction and recycling questionnaire gathered the information concerning public sector recycling. The Arizona Recycling Program's questionnaire is distributed to all local government jurisdictions within the state. The program also distributes a "Treecycle" survey in January of each year to these same jurisdictions to track the number of Christmas trees recycled. A private sector survey, conducted in cooperation with the Arizona Department of Commerce, is distributed to all known private recycling companies, scrap metal dealers, private composters, unincorporated communities, non-profit

organizations, large retailers that may have their own recycling operations, manufacturers of recycled content products and active landfills.

At the time of publication of this report, data from all sectors of the recycling community had not been fully compiled as responses are still being received. Therefore, the information presented here is not complete. As more information is compiled, the recycling rate, diversion rate and generation rate for Arizona will be determined and updated on the Arizona Recycling Program's Web page, www.adeq.state.az.us/environ/waste/solid/recycle.html.

Response Statistics

The Arizona Recycling Program distributed its FY 2001 annual solid waste reduction and recycling questionnaire to 102 governmental jurisdictions in Arizona. At the time of publication of this report, 80 local governments completed their questionnaire. This represents a 78.4 percent response rate. The number of residents represented by the responding jurisdictions accounts for 98.2 percent of the state's population. The Arizona Recycling Program would like to thank those jurisdictions that took the time and effort to respond to the questionnaire.

Volume information was reported by 64 of the jurisdictions for FY 2001. This is the greatest number of jurisdictions reporting materials that were recycled or diverted. A special thanks is given to several organizations that compiled material data for themselves and other communities. The city of Flagstaff reported data not only for itself, but the cities of Williams and Winslow and Coconino County. Pima County provided data for the unincorporated areas of the county, Marana, Oro Valley and Sahuarita. Sedona Recycles, Inc. reported for the cities of Sedona and Cottonwood, the towns of Clarkdale and Camp Verde and the unincorporated areas of the Verde Valley. The Sierra Huachuca Association of Retarded Citizens collected data for the cities of Sierra Vista, Bisbee, Benson, Tombstone and Willcox along with the town of Huachuca City and Cochise County.

Materials Recycled, by Jurisdiction

The materials diverted by each jurisdiction during FY 2001 are listed by volume in Table 1 (located on the fold-out page). This table also divides the major material categories into separate commodities that are of interest to the recycling industry. For example, paper is divided into newspaper (ONP), cardboard (OCC), ONP/OCC, office paper and other paper products. Many of the separate commodities represent those traded by the recycling community. Others, such as office paper, are an aggregate of commodities too numerous to list. Combinations, such as ONP/OCC, represent materials collected together that could not be separated for reporting purposes. Complete descriptions of each commodity are

given beneath the table. The equivalent data by weight are given in Table 2 (located on the fold-out page).

The three jurisdictions that saved the most landfill space by diverting the largest volumes of material during FY 2001 are Maricopa County, Pima County and the city of Phoenix.

Maricopa County continues to lead the state by diverting 273,000 cubic yards of material during the past fiscal year. This is the result of the county's waste tire diversion program, which collects waste tires from the entire county and delivers them to Landstar Polytek in Queen Creek, Ariz. Landstar-Polytek processes a large majority of the tires into crumb rubber, which is used in rubberized asphalt and in the manufacture of various consumer products. Those tires that cannot be processed at Landstar-Polytek are transported to Envirotech Industries of Scottsdale, Ariz. A portion of the tires are processed into crumb rubber, while the remainder is used as a fuel source. The waste tire collection program is the only recycling program operated by Maricopa County.

The **city of Phoenix** offers a comprehensive set of recycling and waste reduction programs for its residents. Programs include a commingled curbside recycling program for single family homes, and three drop-off locations for recyclables. The materials are processed at one of two material recovery facilities (MRFs), the 27th Avenue Recycling Facility or Hudson Baler. The city also offers a series of household hazardous waste (HHW) and battery, oil, paint and antifreeze (BOPA) collection events. Clean loads of greenwaste are diverted at the cities landfill. The material is chipped and a portion is used for city landscaping projects. City of Phoenix offices collect newspaper, office paper, cardboard and aluminum cans. The material is processed by the Arizona Center for the Blind. During FY 2001, the city diverted over 216,000 cubic yards of material from its landfill.

Pima County diverted 106,000 cubic yards of material from its landfills. Like Maricopa County, Pima County operates a waste tire collection program. In addition, like the city of Phoenix, the county also offers a comprehensive array of recycling programs for its residents. The county has drop-off locations for recyclables at its landfills. Private waste haulers are required to offer curbside recycling to their customers. The haulers may bring the materials they collect to the drop-off locations at the landfills, or they may choose to use one of the material processors located in Tucson. The first permanent HHW collection facility in Arizona was established by Pima County. The facility is open on each Friday and Saturday morning for county residents to drop-off their HHW. The

HHW facility also conducts outreach events to its residents and to the residents of other southeastern Arizona counties.

If you compare public recycling and diversion programs by tonnage rather than volume (cubic yards), then a different picture appears. The three largest diverters of solid waste by weight are the city of Phoenix, Pima County and the city of Mesa.

The **city of Phoenix** diverted 81,000 tons of material. The city leapfrogged Maricopa County as county programs rely heavily on diverting waste tires which take up a lot of space in relation to their weight.

Pima County diverted 43,000 tons of material. The county's diverse programs allowed it to remain among the top public recyclers in the state by weight.

The **city of Mesa** diverted the third greatest weight of material, 39,000 tons. Once again, a comprehensive set of waste diversion and recycling programs supported the city's successful effort. Mesa offers commingled curbside recycling to their single family homes, as well as offering multi-family recycling to all mobile home parks and apartment complexes. During FY 2001 the materials collected through these programs were processed at Valley Recycling Works in Chandler, Ariz. Residents may also take advantage of a curbside greenwaste diversion program. Yard waste is collected from a green, 90-gallon container on the same day as recyclables. The material is transported to Salt River Landfill where Western Organics, Inc. , a private composting company, processes the material. Appliances can also be pick-up curbside for recycling. Drop-off locations exist for traditional recyclables. HHW collection events are held monthly. Large roll-off containers are available for neighborhoods for clean-ups and for golf courses and other businesses for the collection of greenwaste and other bulky material. Commercial establishments may also contract with Mesa to collect traditional recyclables such as cardboard and office paper.

The jurisdictions noted above dominate the amount of waste diverted from landfills, in part, due to their large populations. However, a more accurate measure of the success of a jurisdiction's efforts may be the jurisdiction's diversion rate. This is obtained by dividing the amount of material each jurisdiction reported diverted by the amount of material generated in each jurisdiction. Table 3 lists the material diverted during FY 2001 by each jurisdiction and an estimate of the municipal solid waste generated during that same time period. The amount of material generated is determined by multiplying the jurisdiction's population by 1.06 tons per person per year, Arizona's generation rate.

The method of obtaining diversion rates is speculative at best. The generation rate will change from year to year. However, the Arizona Recycling Program has made the decision to change from a volume based to a weight based calculation to eliminate uncertainties in various conversion factors. Population figures may also be misleading. For instance, a jurisdiction may operate a recycling facility that receives material from outside its boundaries, thus inflating the jurisdiction's diversion rate. Counties have an advantage, as they may be responsible for diverting material for all residents, while the population figure used to calculate the county's diversion rate accounts only for residents residing in unincorporated areas. Steps have been taken to correct the systematic errors this has caused in the past. Figures from organizations that serve a number of jurisdictions have been divided, when possible, to reflect the quantity of material coming from each jurisdiction. Finally, in an effort to retain confidentiality, the Arizona Department of Commerce Market Development Program can not assign private recycling facility data to particular jurisdictions. Therefore, cities and towns serviced in whole, or in part, by private recycling haulers and processors will have underestimated diversion rates. Due to these circumstances, accurate diversion rates are not reported in all cases.

The three jurisdictions with the highest diversion rates are the town of Pinetop-Lakeside, the city of Sedona and the city of Douglas.

The ***town of Pinetop-Lakeside*** was able to divert 84.4 percent of the quantity of solid waste it generated during FY 2001. The town was able to divert this much waste as it operates an in-vessel composting system that processes municipal solid waste mixed with biosolids generated from its sewage treatment facility. In order for the in-vessel composter to mix properly with the biosolids, a large percentage of the MSW it utilizes is from surrounding communities. If the various communities which have waste processed by the composter could identify their contributions then their diversion rates would increase, while Pinetop-Lakeside's would decrease. However, private waste haulers account for much of the material resulting in difficulty in attributing the waste to individual communities. The finished compost is sold in bulk to various customers.

The ***city of Sedona*** diverted 25.8 percent of the waste it was responsible for generating. Residents of Sedona may take advantage of a well developed drop-off program, or they may sign up for one of the curbside programs operated by private waste hauling companies. All the material collected in the city is processed by Sedona Recycles, a non-profit organization devoted to maximizing recycling and reducing solid waste throughout the Verde Valley area. Though Sedona Recycles also processes material from outside the city, the non-profit keeps detailed records that track the community from which each load of recyclables

originated. Therefore, the diversion rate quoted above truly represents the city of Sedona's effort.

The **city of Douglas** diverted 19.2 percent of the waste it generated. Douglas is located in the southeast corner of Arizona along the Mexican border. It serves as a retail center for Mexican citizens crossing the border to purchase consumer products. The result of this economic activity is a large supply of recyclable cardboard, the container in which the consumer products are shipped. By tracking the cardboard the city processes through its facility and materials recycled by the large stand alone retailers, the city of Douglas is able to verify the recycling taking place in the community. The city recycling programs include a drop-off recycling location for its residents and recycling pick-ups for the business community. A green waste diversion program operated at the city's transfer station also diverts a large quantity of yard and wood waste.

Other jurisdictions with high diversion rates include: Sierra Vista (17.2 percent), Coolidge (15.7 percent), Jerome (15.5 percent), Flagstaff (15.4 percent), and Williams (15.1 percent). Curbside recycling is provided to the residents of Flagstaff, Williams and Jerome, while Coolidge, Douglas and Sierra Vista reach their high diversion rates through drop-off recycling programs.

Table 3 illustrates solid waste generated and diverted by local government jurisdictions. These data are based on FY 2001 information. The source for population statistics is the *Profiles of General Demographic Characteristics: 2000 Census of Population and Housing, Arizona, U. S. Department of Commerce, May 2001*. Tonnages generated are determined by multiplying each jurisdiction's population by 1.06 tons per person per year, the state average for generating municipal solid waste. Diversion rates are determined to three digits to match the accuracy of the state's generation rate.

Jurisdiction	County	Population	Waste Generated (tons)	Reported as Diverted (tons)	Diversion Rate (percent)
Apache County	Apache	60,149	63,800	5.31	0.00832
Apache Junction	Pinal	31,814	33,700	4.35	0.0129
Avondale	Maricopa	35,883	38,000	0	0
Benson	Cochise	4,711	4,990	259.56	5.20

Table 3. Solid Waste Generated and Diverted by Local Government Jurisdictions

Jurisdiction	County	Population	Waste Generated (tons)	Reported as Diverted (tons)	Diversion Rate (percent)
Bisbee	Cochise	6,090	6,460	279.75	4.33
Buckeye	Maricopa	6,537	6,930	0	0
Bullhead City	Mohave	33,769	35,800	0	0
Camp Verde	Yavapai	9,451	10,000	128.56	1.29
Carefree	Maricopa	2,927	3,100	92.11	2.97
Casa Grande	Pinal	25,224	26,700	1,264.23	4.73
Cave Creek	Maricopa	3,728	3,950	123.39	3.12
Chandler	Maricopa	176,581	187,000	24,617.30	13.2
Chino Valley	Yavapai	7,835	8,310	70.64	0.850
Clarkdale	Yavapai	3,422	3,630	110.88	3.05
Clifton	Greenlee	2,596	2,750	21.02	0.764
Cochise County	Cochise	47,879	50,800	2,897.64	5.70
Coconino County	Coconino	52,739	55,900	2,057.51	3.68
Colorado City	Mohave	3,334	3,530	Not Available	
Coolidge	Pinal	7,786	8,250	1,291.38	15.7
Cottonwood	Yavapai	9,179	9,730	194.31	2.00
Douglas	Cochise	14,312	15,200	2,918.88	19.2
Duncan	Greenlee	812	861	Not Available	
Eagar	Apache	4,033	4,270	Not Available	
El Mirage	Maricopa	7,609	8,070	Not Available	
Eloy	Pinal	10,375	11,000	Not Available	
Flagstaff	Coconino	52,894	56,100	8,658.29	15.4
Florence	Pinal	17,054	18,100	487.01	2.69
Fountain Hills	Maricopa	20,235	21,400	0	0

Table 3. Solid Waste Generated and Diverted by Local Government Jurisdictions					
Jurisdiction	County	Population	Waste Generated (tons)	Reported as Diverted (tons)	Diversion Rate (percent)
Fredonia	Coconino	1,036	1,098	Not Available	
Gila Bend	Maricopa	1,980	2,100	12.75	0.607
Gila County	Gila	26,958	28,600	3,067.44	41.4
Gilbert	Maricopa	109,697	116,300	9,449.19	8.12
Glendale	Maricopa	281,812	299,000	18,781.85	6.28
Globe	Gila	7,486	7,940	Not Available	
Goodyear	Maricopa	18,911	20,000	174.50	0.873
Graham County	Graham	18,246	19,300	506.96	11.0
Greenlee County	Greenlee	5,139	5,450	1.73	0.0317
Guadalupe	Maricopa	5,228	5,540	Not Available	
Hayden	Gila	892	946	0	0
Holbrook	Navajo	4,917	5,210	199.64	3.83
Huachuca City	Cochise	1,751	1,860	37.62	2.02
Jerome	Yavapai	329	349	54.04	15.5
Kearny	Pinal	2,249	1,900	0	0
Kingman	Mohave	20,069	21,300	25.00	0.117
Lake Havasu City	Mohave	41,938	44,500	2,896.75	6.51
La Paz County	La Paz	13,221	14,000	258.60	1.85
Litchfield Park	Maricopa	3,810	4,040	420.39	10.4
Mammoth	Pinal	1,762	1,870	Not Available	
Marana	Pima	13,556	14,400	27.09	0.188
Maricopa County	Maricopa	211,203	224,000	30,374.97	86.5
Mesa	Maricopa	396,375	420,000	38,580.05	9.19
Miami	Gila	1,936	2,050	3.00	0.146

Table 3. Solid Waste Generated and Diverted by Local Government Jurisdictions

Jurisdiction	County	Population	Waste Generated (tons)	Reported as Diverted (tons)	Diversion Rate (percent)
Mohave County	Mohave	55,592	58,900	0	0
Navajo County	Navajo	64,120	68,000	933.82	1.37
Nogales	Santa Cruz	20,878	22,100	0	0
Oro Valley	Pima	29,700	31,500	2,024.21	6.43
Page	Coconino	6,809	7,220	Not Available	
Paradise Valley	Maricopa	13,664	14,500	0	0
Parker	La Paz	3,140	3,330	0.21	0.0063
Patagonia	Santa Cruz	881	934	40.00	4.28
Payson	Gila	13,620	14,400	314.73	2.19
Peoria	Maricopa	108,364	114,900	272.85	0.237
Phoenix	Maricopa	1,321,045	1,400,000	80,898.94	5.78
Pima	Graham	1,989	2,110	0	0
Pima County	Pima	305,059	323,000	43,070.59	13.3
Pinal County	Pinal	80,209	85,000	10,898.26	12.8
Pinetop-Lakeside	Navajo	3,582	3,800	3,221.05	84.8
Prescott	Yavapai	33,938	36,000	2,086.94	5.80
Prescott Valley	Yavapai	23,535	24,900	0	0
Quartzsite	La Paz	3,354	3,560	Not Available	
Queen Creek	Maricopa	4,316	4,570	0	0
Safford	Graham	9,232	9,790	0	0
Sahuarita	Pima	3,242	3,440	7.72	0.224
Santa Cruz	Santa Cruz	16,622	17,600	650.82	3.70
San Luis	Yuma	15,322	16,200	56.20	0.347
Scottsdale	Maricopa	202,705	215,000	26,438.27	12.3

Table 3. Solid Waste Generated and Diverted by Local Government Jurisdictions					
Jurisdiction	County	Population	Waste Generated (tons)	Reported as Diverted (tons)	Diversion Rate (percent)
Sedona	Yavapai	10,192	10,800	2,786.52	25.8
Show Low	Navajo	7,695	8,160	0	0
Sierra Vista	Cochise	37,775	40,000	6,858.93	17.2
Snowflake	Navajo	4,460	4,730	Not Available	
Somerton	Yuma	7,266	7,410	0	0
South Tucson	Pima	5,490	5,600	Not Available	
Springerville	Apache	1,972	2,090	Not Available	
St. Johns	Apache	3,269	3,470	Not Available	
Superior	Pinal	3,254	3,450	Not Available	
Surprise	Maricopa	30,848	32,700	0	0
Taylor	Navajo	3,176	3,370	Not Available	
Tempe	Maricopa	158,625	168,000	23,560.57	14.0
Thatcher	Graham	4,022	4,260	Not Available	
Tolleson	Maricopa	4,974	5,270	Not Available	
Tombstone	Cochise	1,504	1,590	111.41	7.01
Tucson	Pima	686,699	728,000	19,755.04	2.71
Wellton	Yuma	1,829	1,940	0	0
Wickenburg	Maricopa	5,082	5,390	1.67	0.0310
Willcox	Cochise	3,733	3,960	203.83	5.15
Williams	Coconino	2,842	3,010	455.48	15.1
Winkelman	Gila	443	470	Not Available	
Winslow	Navajo	9,520	10,090	8.20	0.0813
Yavapai County	Yavapai	69,636	73,800	2,468.82	3.35
Youngtown	Maricopa	3,010	3,190	Not Available	

Table 3. Solid Waste Generated and Diverted by Local Government Jurisdictions

Jurisdiction	County	Population	Waste Generated (tons)	Reported as Diverted (tons)	Diversion Rate (percent)
Yuma	Yuma	77,515	82,200	70.50	0.0858
Yuma County	Yuma	58,094	59,300	507.53	0.856
Totals		5,393,302	5,720,000	378,057	6.61

Residential Curbside Recycling Programs

The most convenient method for residents to recycle is through residential curbside recycling. In most cases, a recycling bin is supplied to each household. Often times a recycling pick-up day occurs once a week and a solid waste (garbage) pick-up day occurs once a week. This reduces the effort required to recycle and helps promote the recycling habit. Due to the convenience, residential curbside recycling is the major source of recyclable material collected by public jurisdictions.

A residential curbside recycling program is defined as any program that collects a variety of materials left in close proximity to their sources on a regularly scheduled basis. The program requires the collection of one recyclable material other than greenwaste or white goods. Material can be collected at the curb or alley for single-family residences. Multi-family complexes are included if on-site recycling containers are provided. The recyclable materials may be source separated, sorted at the curb, commingled, blue bag programs or the complete residential waste stream sorted at a “dirty MRF.” Scheduled collection must be at least once per month. Curbside recycling programs may be operated by large waste hauling companies, municipal solid waste management departments or small businesses. They occur in both metropolitan and rural areas. The city of Phoenix, population 1.3 million, operates the state’s largest curbside recycling program. While the town of Jerome, the smallest incorporated area in Arizona, population 329, operates one of the smallest. The number of residents within the 922,000 homes served by curbside recycling programs throughout the state is estimated to be 2,430,000, or 47.4 percent of the state’s population.

The growth of curbside recycling is documented on Table 4 and illustrated in Figure 2. These both show the number of households participating in curbside recycling programs by year. Though the city of Tucson had residential pick-up of newspapers for recycling in the 1970s, residential curbside recycling in Arizona as we know it today began in 1988. At that time, the city of Tempe initiated its first

pilot program servicing 816 homes. Since that time, residential curbside recycling programs have operated continuously, and have steadily grown in size. From 1988 to 1991, small pilot curbside recycling programs were introduced. In 1992, Gilbert became the first jurisdiction to offer curbside recycling to all single-family homes. Since that time, curbside recycling has shown a rapid growth as large metropolitan cities began implementing jurisdiction-wide curbside programs. By the mid-1990s the number of jurisdictions offering this type of recycling leveled off, while the number of households continued to grow. From 1996 through 1998, low commodity prices forced collection programs in marginally profitable routes to close, thus the number of curbside recycling programs began to fall. This caused a reduction in the number of households participating in curbside recycling programs across the state, but especially in Pima County, and the result was a small decrease in the total number of participating households in 1998. However, from 1999 to the present, the implementation of jurisdiction-wide recycling programs in Flagstaff, Williams and Glendale has caused the number of households to increase, again. Several cities are presently contemplating curbside recycling for their residents. The immediate trend for the future is for the number of households participating in curbside recycling to continue to rise.

Table 4. Growth in the Number of Jurisdictions Offering Curbside Recycling and Households Having the Opportunity to Participate

Year	Number of Households	Number of Jurisdictions	Year	Number of Households	Number of Jurisdictions
1988	1,000	1	1995	528,000	32
1989	13,000	4	1996	628,000	28
1990	24,000	7	1997	692,000	33
1991	82,000	15	1998	691,000	22
1992	200,000	24	1999	788,000	25
1993	298,000	29	2000	837,000	27
1994	418,000	32	2001	922,000	27

Figures are estimates for Dec. 31 of each year. 2001 figures are based on program status as of July 1, 2001.

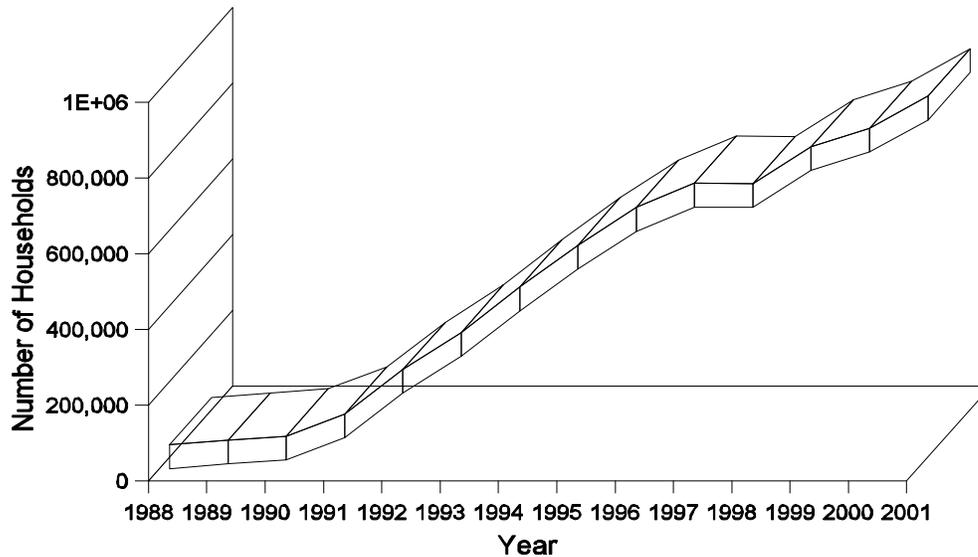


Figure 2. The growth of curbside recycling. The period between 1988 and 1991 reflects the initiation of small pilot curbside recycling programs. Since 1992 the implementation of larger programs has sustained a rapid growth in the number of households being offered curbside recycling.

Costs and Revenue

The Arizona Solid Waste Recycling Statute (A.R.S. §49-832.C.4.) requires that the following information be reported annually:

- , The costs of operating and maintaining recycling programs
- , The revenue from the sale or use of recycled materials for existing programs
- , The costs avoided in processing or disposal

An analysis of the cost and revenue data reported by government jurisdictions can provide a general idea of the financial aspects of recycling programs in operation around the state. Although, this information must be reported, jurisdictions are not required to respond to our annual recycling surveys. At the time of publication, only 43 jurisdictions provided information regarding costs and revenue. There are insufficient data to provide a complete analysis of this issue. The challenges and issues regarding costs and revenue for recycling programs vary greatly, therefore, jurisdictions should not be directly compared. Table 5 provides the information reported by jurisdictions.

Costs of Recycling Programs

The cost of operating and maintaining each recycling program is identified in

response to the Arizona Recycling Program's annual questionnaire. These costs include, when applicable: land, insurance, equipment, personnel, overhead, consultants, construction, additional procurement programs (purchasing recycled-content materials) and other related costs. Some jurisdictions indicated that the costs reflect several different types of recycling programs, while others stated that costs reflect a specific type of recycling program, such as funding a household hazardous waste event. Also, a jurisdiction's operational expenses may change significantly from year to year due to the purchase of capital equipment.

The data from jurisdictions who reported this information shows that costs ranged from as low as \$172 per year for the town of Patagonia, to as high as \$11,600,000 for the city of Glendale (Glendale built a material recovery facility during this fiscal year).

Revenue of Recycling Programs

Funds from the resale of a usable item or the sale of a recyclable item qualify as revenue of recycling programs. The greatest amount of revenue reported was \$6,153,915 from the city of Phoenix; showing a profit of over \$1.4 million. The least amount of revenue reported by those jurisdictions responding was \$146 by the town of Florence. The total revenue generated statewide, based on the 43 reporting jurisdictions, were \$9,653,500.

Avoided Costs Due to Recycling Programs

Avoided costs are neither revenue nor funds received, but cost savings by diverting solid waste from the landfills. These avoided costs should be considered when evaluating the cost effectiveness of a recycling program. Avoided costs represent what would be paid to landfill, incinerate or otherwise legally dispose of the solid waste. Typically, this estimate is based on the disposal, or tipping fees, that would have been charged had the solid waste been landfilled, but other landfill operation costs may also be included. For example, landfill operation cost avoidance can reflect the reduction of maintenance on landfill equipment, due to the diversion of such items as scrap metal. It is also important to consider the costs avoided for siting and constructing a new landfill due to the landfill space saved by waste diversion.

A total of \$4,875,804 was realized as avoided costs by those jurisdictions that reported such costs this fiscal year. The avoided costs ranged from \$1,400 for the town of Patagonia to \$2,082,088 for the city of Phoenix.

Table 5 shows the costs, revenue and avoided costs of operating a recycling program in Arizona. Only cities reporting data are included in this table. Jurisdictions should not be directly compared due to the differences in what each considers costs and revenue.

Table 5. The Costs, Revenue and Avoided Costs of Operating a Recycling Program in Arizona

Jurisdiction	Population	Operational Costs	Revenue	Avoided Costs
Bisbee	6,090	\$17,391	N/L	\$6,625
Camp Verde	9,900	\$1,800	N/L	N/L
Carefree	2,927	\$1,800	0	N/L
Casa Grande	25,224	\$202,846	\$104,193	N/L
Cave Creek	38,500	\$1,800	N/L	N/L
Chandler	58,000	\$1,417,359	\$113,738	\$416,816
Chino Valley	7,835	\$15,000	0	0
Clarkdale	3,422	N/L	\$4,658	N/L
Clifton	2,596	\$600	N/L	N/L
Cottonwood	9,179	\$19,850	N/L	\$8,300
Coolidge	7,786	N/L	\$1,235	N/L
Douglas	14,312	\$55,000	\$10,104	\$110,614
Flagstaff	52,894	\$928,095	\$144,735	\$292,486
Florence	17,054	N/L	\$146	\$4,250
Gilbert	109,697	\$726,000	\$0	\$0
Glendale	218,812	\$11,600,000	1,320,000	\$356,084
Goodyear	18,911	\$17,638	0	\$4,420
Litchfield Park	3,810	0	0	\$2,280
Holbrook	4,917	\$22,166	N/L	\$4,462
Huachuca City	1,751	\$400	0	N/L
Jerome	329	\$4,800	\$352	\$2,252
Lake Havasu	41,938	\$292,268	\$157,252	\$41,545
Mesa	396,375	\$3,525,000	\$460,900	\$647,800
Patagonia	881	\$172	0	\$1,400
Payson	13,620	\$9,000	0	N/L
Peoria	108,364	\$218,900	\$2,604	\$7,315

Jurisdiction	Population	Operational Costs	Revenue	Avoided Costs
Phoenix	1,321,045	\$4,756,422	\$6,153,915	\$2,082,088
Prescott	33,938	\$279,159	\$14,243	\$107,692
San Luis	15,322	\$1,120	0	\$6,110
Scottsdale	202,705	\$3,388,376	\$249,941	\$376,318
Sierra Vista	37,775	\$63,000	20,843	\$132,605
Somerton	7,266	\$1,400	N/L	N/L
Tempe	158,625	\$5,775,404	\$366,361	\$46,850
Tucson	486,699	\$1,570,840	\$49,756	\$95,411
Yuma	70,000	18,578	0	\$14,033
Coconino County	52,739	\$24,787	\$1,300	N/L
Graham County	18,911	\$51,026	N/L	N/L
La Paz County	13,221	\$8,900	\$2,590	\$9,352
Pima County	305,059	\$75,000	\$50,000	N/L
Pinal County	80,209	\$184,158	\$54,613	\$48,577
Yavapai County**	69,636	\$369,758	\$310,140	\$17,500
Yuma County	58,094	\$147,294	0	0
Santa Cruz County	16,622	\$104,944	\$59,881	\$32,619
Total	4,088,990	\$35,898,051	\$9,653,500	\$4,875,804

* N/L means the information was not listed in the report.

** Includes Waste Tire Program monies.

Cost/Revenue Comparison

There are many challenges when comparing the costs and revenue of recycling programs. Each jurisdiction does not offer the exact same combination of recycling programs nor financing methods for programs. While one jurisdiction may provide only one recycling program, another may offer a variety of different programs. The types of recycling programs offered range from curbside to drop-off collection, household hazardous waste collection year-round to individual events,

greenwaste drop-off to a curbside collection and Christmas Treecycling to white goods collection.

Some jurisdictions mix their recycling program funding with other solid waste programs, and thus, cannot be identified specifically as recycling costs. Furthermore, debate exists regarding financial issues within the recycling and solid waste industry, due to the range of definitions of revenue, avoided costs and operational costs. Some jurisdictions have contracts with private recycling companies to collect, sort and broker the materials. As a result, these jurisdictions are not privy to complete financial information. The financial figures of the private companies may not be represented in this report. Other jurisdictions may operate a recycling program as well as a landfill. In such a scenario, the avoided costs of paying tipping fees for recycled material that was diverted from the landfill may be viewed as a loss of revenue for the landfill operation and may not be reported. The costs and revenue comparison is only an approximate analysis due to the difficulty in achieving consistent statewide definitions of a recycling budget and types of programs offered. Each jurisdiction should be evaluated separately.

The costs and revenue comparison only addresses the financial aspects of recycling. There are also indirect savings and relative benefits that are difficult for individual jurisdictions to quantify in dollars, but should be considered in overall program evaluations. These include resource conservation, energy savings and pollution prevention.

Recycling Funding Programs and Funded Projects

Pursuant to A.R.S. §49-837 B.1-2, the Arizona Recycling Program administers a funding program that provides financial assistance or start-up money to private businesses, non-profit organizations and governmental entities existing or servicing areas within Arizona. Throughout FY 1991 and FY 1992, the recycling fund was referred to as the Reduce, Reuse and Recycle Grant (RRR Grant). The funding was awarded to projects that focused on source reduction of solid waste and source reduction education. In FY 1993, the RRR Grant was separated into two types of funding programs: the Waste Reduction Assistance (WRA) Program and the Waste Reduction Initiative Through Education (WRITE) Program.

In an effort to address the difficulties associated with recycling in both rural and urban communities, the Arizona Recycling Program offered several specialized funding programs. In FY 1996, WRA funds focusing exclusively on household hazardous waste projects were made available to local governmental entities. In FY 1997, WRA funds were made available to individuals and/or organizations established or residing in a jurisdiction with a population of 100,000 or fewer. And in FY 1998, another specialized fund was developed to address research and

development in the recycling industry. This program was later named the Waste Reduction Assistance Research and Development (WRA R and D) Program.

Since the Arizona Recycling Program's inception in 1990, it has provided over \$8.2 million in funding (see Table 6). Public jurisdictions received funding for 86 projects, the private sector (businesses and organizations) received funding for 63 projects, 56 non-profit organization projects were funded and universities and colleges received funding for 12 projects; a total of 217 projects received funding from the program.

Table 6 lists the type of funding programs and the amount awarded during each fiscal year. Funding programs include Reduce, Reuse, Recycle (RRR), Waste Reduction Education (WRE), Waste Reduction Assistance (WRA), Waste Reduction Initiative Through Education (WRITE), Household Hazardous Waste (HHW), Small Community Waste Reduction Assistance (SCWRA) and Waste Reduction Assistance Research and Development (WRA R and D).

Table 6. Funding Programs and Amounts

Fiscal Year	RRR	WRE	WRA	WRITE	HHW	SCWRA	WRA R and D
1991	\$867,402						
1992	\$640,020						
1993		\$88,331					
1994			\$447,282				
1995				\$210,472			
1996			\$420,242		\$1,217,977		
1997						\$332,509	
1998			\$599,616	\$222,486			
1999			\$547,521	\$258,723			\$186,630
2000			\$841,669	\$253,381			\$81,915
2001			\$715,105	\$181,106			\$160,430
Totals	\$1,507,422	\$88,331	\$3,571,435	\$1,126,168	\$1,217,977	\$332,509	\$428,975

Waste Reduction Assistance Program

The focus of the WRA Program is to provide funding to projects that divert significant amounts of material from the solid waste stream, or that represent comprehensive programs designed to achieve high solid waste diversion levels.

All projects must be related to one or more of the following: the proper disposal of solid waste, source reduction, reuse, recycling, buying recycled content products and/or composting. For additional information on the WRA Program or on the following projects, please contact the program coordinator at (602) 207-4170 or, toll free in Arizona, (800) 234-5677, Ext. 4170.

FY 2001 Waste Reduction Assistance Projects

The FY 2001 WRA project funding was available to private businesses, non-profit organizations and governmental entities existing or servicing areas within Arizona. A total of \$715,105 was awarded to 13 projects* selected from 49 submitted proposals. The project period began April 2001 and will conclude April 2002. Organizations awarded up to and including \$35,000 were required to match a minimum of 20 percent of the total project cost. WRA proposals requesting between \$35,001 to \$75,000 must include a minimum match of 35 percent and \$75,001 to \$100,000 must provide a minimum match of 50 percent of the total project cost. The following is a brief description of each proposal.

**The funding was declined.*

Town of Payson – Household Hazardous Products Collection Event

Colin “Buzz” Walker
303 N. Baseline Hwy.
Payson, AZ 85541

Project Award \$17,005

The town of Payson proposed to develop an annual household hazardous products (HHP) collection event. The town of Payson requested funding to be used to conduct their first collection event and to develop an on-going HHP school education program targeting third through sixth grades. The purpose of the HHP collection event is to divert large quantities of potentially polluting household products from the Buckhead Mesa Landfill and increase the awareness of proper use and disposal of HHP. It is anticipated that over 24,000 pounds of materials would be collected. Walmart has partnered with the town by providing its parking lot as the collection site.

City of Phoenix Solid Waste Field Services – Appliances/Electronics Collection and Recycling Program

Mark Leonard
101 S. Central Ave.
Phoenix, AZ 85004

Project Award \$100,000

The city of Phoenix proposed to purchase two collection vehicles to be used to remove at least 10,000 tons of reusable and recyclable appliances and electronics from the city’s solid waste stream. Consequently, this would save valuable landfill space, protect the environment through the safe disposal of hazardous wastes and provide appliance/electronics materials for reuse or recycling. The proposal

provided for establishing a collection program that Phoenix homeowners can call and make an appointment for the collection of appliances and electronic equipment directly from their residential property. The city of Phoenix would provide the service, operation and maintenance funding to operate the vehicles, and the personnel to administer the program.

Palo Verde Valley Disposal Service – Southern La Paz County Cooperative Recycling Program

Gordon Beers
14701 S. Broadway
Blythe, CA 92225

Project Award \$99,960

As part of a community-wide effort to reduce solid waste disposal in southern La Paz County, Palo Verde Disposal would develop a recycling processing center in Quartzsite, Ariz. and expand a collection program for the recovered materials. This project would employ full-time drivers, sorters, site managers and a public outreach coordinator to establish policies and procedures for this program and to insure that it fully meets the goals and policies of the community and the Arizona Recycling Program. The program would potentially divert more than 20 tons per week, or 1,000 tons annually, of materials from the regional landfill.

Norton Environmental Company – New Recycling Truck to Service Coconino County

Steven Viny
1800 E. Butler
Flagstaff, AZ 86001

Project Award \$99,840

Norton Environmental Company owns and operates a material recovery facility (MRF) in Flagstaff, Ariz. The MRF accepts recyclable materials for the city of Flagstaff. Norton proposed to purchase a new Heil 7000 SB “Split Bin” recycling/rubbish truck to expand curbside recycling service into the unincorporated areas of Coconino County. The split bin system has many advantages over more traditional methods of recycling, including lower VOC emissions as all materials are picked up with a single haul, thus eliminating a second pick-up, less wear on roads as only one truck is used and high landfill diversion rates. It would also serve as a model for other communities to follow.

City of San Luis Dept. of Public Works – Purchase of Chipper

David Ford
P. O. Box 3750
San Luis, AZ 85349

Project Award \$24,000

The city of San Luis proposed to purchase a chipper to mulch grass, branches and limbs from the city’s parks department, along with quarterly residential

collections. They also proposed to construct a dedicated area where residents can dispose of their greenwaste prior to quarterly bulk collections. The city believed that this project would divert more than 75 tons of material from the landfill. The city proposed to use public works employees to collect the material and promote the educational program.

City of Douglas – Horizontal Baler

Charles Ebner

Project Award \$39,900

425 10th St.

Douglas, AZ 85607

Through the project proposed by the city of Douglas, an EX60-11 horizontal baler would be purchased to increase their output of cardboard recycling. The city of Douglas proposed to hire a full time employee and two inmates from the Arizona Department of Corrections to assist with the education program. It is anticipated that the city's diversion rate would increase from 11 percent to 37 percent.

Valley Recycling Works, Incorporated – Waste Reduction Assistance Proposal

Michael Kean

Project Award \$47,708

390 E. Ray Rd.

Chandler, AZ 85225

The Phoenix metropolitan area has one of the most successful recycling collection programs, in terms of residential participation, in the state. The majority of this material is collected through residential blue barrel programs, which results in a significant diversion rate of recyclable materials. The proposed project would focus on providing recycling to residents in multi-family housing. Residents living in complexes, apartments and townhouses represent approximately 20-25 percent of the population. Valley Recycling Works' proposal is to initiate a program that would seek to test and document solutions to the limited collection of recyclable materials at large multi-family housing complexes. The funding would assist in purchasing collection bins and recyclable baskets, along with educational materials.

Town of Gila Bend – Greenwaste Utilization Program

Rana Lewis

Project Award \$56,300*

P. O. Box A

644 W. Pima

Gila Bend, AZ 85337

The town of Gila Bend proposed to purchase a Progrind 9000 chipper to grind greenwaste that is presently being disposed of in the landfill into mulch. The mulch created would be available for use by the town of Gila Bend, residents and

commercial agricultural operations. Along with purchasing the chipper, the town would develop educational materials to increase the residents' awareness of the benefits of environmental recycling programs and activities. By purchasing the chipper, the town would divert over 60 yards of greenwaste each month from the landfill.

**Funding was awarded, but the town of Gila Bend declined the award due to internal circumstances.*

City of Winslow – Winslow Recycles Saving for Our Future

Dianne Henebry
21 Williamson Ave.
Winslow, AZ 86047

Project Award \$11,800

The city of Winslow is in the process of educating their residents on the 3 Rs, reduce, reuse and recycle. The goal of this program is to provide a cost effective way to transport recyclable materials to Norton Environmental's material recovery facility (MRF), located in Flagstaff, Ariz. The requested funding would be used to purchase two recycling trailers that would be used to begin weekly transport of materials to the MRF. This project would provide Winslow residents with two convenient locations to drop-off their newspapers, aluminum cans and mixed paper for recycling, as well as a way to transport their materials to the closest MRF.

Sierra Huachuca ARC, Inc. – SHARC Fiber Recycling Project

Mario Gonzales
120 N. Sixth St.
Sierra Vista, AZ 85635

Project Award \$60,000

Sierra Huachuca ARC, Inc. requested funding to purchase two new F 350 one ton trucks to increase the collection and processing of collectable fiber products in Cochise County. Through this project, it is estimated that an additional 300 tons per year of fiber products would be diverted from the landfill. With a new truck at each recycling plant (one in Sierra Vista and one in Benson), Sierra Huachuca ARC, Inc. would be able to provide better service to existing customers and expand service to other parts of Cochise County.

San Pedro Natural Resource Conservation District – Benson Community
Yard Waste to Compost

Sharon Reid
880 W. Fourth St., Suite 2
Benson, AZ 85602

Project Award \$35,200

The San Pedro Natural Resource Conservation District proposed to purchase a Vermeer brush chipper to keep yard waste in the Benson community from

entering the landfill by turning the yard waste into a useable product. The District's staff would initiate a local education effort to notify residents of this new recycling option. A greenwaste drop-off location would be sited. The city of Benson estimated that this project would divert 70,000 pounds of organic waste from the Cochise County landfill annually. This project would establish a permanent greenwaste reduction program for the community.

Environmental Concerns Organization – Glass Processing Expansion Project

Gina D'Abella

Project Award \$23,392

P. O. Box 1289

Maricopa, AZ 85239

Environmental Concerns Organization's (ECO) project goal is to provide a convenient and cost effective glass recycling program to the residents and businesses of the rural town of Maricopa and surrounding communities. The project would collect approximately 1290 pounds of glass each month. The glass would be molded into marketable products such as decorative glassware. Markets have already been established to sell the glass. ECO proposed to purchase two kilns and related equipment.

Western Organics, Incorporated – Bagging for the Future

Doug Porter

Project Award \$100,000

P. O. Box 25406

Tempe, AZ 85285-5406

Western Organics, Incorporated requested funding for bagging equipment that would be used to increase the output of their composting facility. Last year, Western Organics composted 360,000 cubic yards of material. With the addition of this bagging equipment, they estimated that over the first year of this project, the diversion would exceed 12,000 tons. Western Organics has proven their ability to manage and market their product. This expansion would assist in their growth to increase the amount of material being sold, processed and diverted.

Waste Reduction Assistance Research and Development Program

The Waste Reduction Assistance Research and Development (WRA R and D) Program was separated from the WRA Program in the summer of 1998 in order to evaluate both types of proposals on a more equitable basis. The goal of the WRA R and D Program is to develop tools and ideas that would divert significant amounts of material from the solid waste stream in the future. For additional information on the WRA R and D Program or on the following projects, please contact the program coordinator at (602) 207-4173 or, toll free in Arizona, (800) 234-5677, Ext. 4173.

FY 2001 Waste Reduction Assistance Research and Development Projects

FY 2001 WRA R and D project funding was available to private businesses, non-profit organizations and governmental entities existing or servicing areas within Arizona. A total of \$160,430 was awarded to four projects selected from 15 submitted proposals. The project period began April 2001 and will conclude April 2002. Organizations awarded must provide a minimum match of 25 percent of the total project cost. The following is a brief description of each proposal.

City of Goodyear Public Works Department – Regional Recycling Master Plan for the Southwest Valley

Steve Ruppenthal
200 S. Calle Del Pueblo
Goodyear, AZ 85338

Project Award \$50,000

The communities of Goodyear, Avondale, Tolleson, Litchfield Park and potentially Buckeye, propose to contract with a consultant to develop and publish a regional recycling master plan for the southwest valley. The primary goal would be to develop a united approach to recycling within these small communities, develop a regional recommendation that addresses the recycling needs of the residents and gather information on each jurisdiction in order to develop a recycling program specific to each community in the event that a regional approach to recycling is not possible.

Sonora Environmental Research Institute, Incorporated – Use of Cullet as a Tennis Court Surface

Ann Marie Wolf
3202 Grant Rd.
Tucson, AZ 85716

Project Award \$48,660

The overall goal is to research the feasibility of creating formulations of recycled mixed glass cullet for use as an athletic surface, specifically, as a substitute for synthetic and natural clay tennis court surfaces. Sonora Environmental Research Institute, Inc. (SERI) requested funding to research the types of materials and surface colors that can be used and determine optimum mesh range and color degradation. SERI also wants to verify that the glass cullet meets the specifications of surface manufacturers and court associations.

Town of Eagar – Recycling Feasibility and Gaps Analysis

Rick Pinckard
P. O. Box 1300
Eagar, AZ 85925

Project Award \$18,420

The town of Eagar requested funds to research the amount of the waste they receive from the residents and businesses of southern Apache County. The goal

of this project is to perform a feasibility study and gaps-in-existing-services analysis to make better recommendations for economically viable recycling services. A secondary goal is to make the information collected available to start-up or expanding businesses that would consider entering the recycling collection-transportation-manufacturing cycle in the area. It is estimated that recycling efforts in Apache County would divert approximately 375 tons per year.

Suntext Corporation DBA Alliance Book Company – Commercializing an Automatic Book Cutting Machine

Jon Hinz

Project Award \$43,350

639 W. Second Ave.

Mesa, AZ 85210

The goal of this research and development project is to bring the prototype book cutting machine up to commercial standards and production. Suntext Corporation proposed to build and test, under commercial conditions, a final prototype incorporating the best design and functional components commercially available. The project also included the production of a video, development of a brochure that illustrates the machine's operation and capabilities and then distribute these materials to members of the recycling community and potential manufacturers. The proposed project would assist with the recycling of a wider range of materials that would otherwise be included in the solid waste stream.

Waste Reduction Initiative Through Education Program

The focus of the WRITE Program is to provide Arizona residents with the information and education to increase their awareness for properly reducing and disposing of solid waste and to encourage participation in source reduction, reuse and recycling. Education projects may include, but are not limited to: school curricula, workshops, seminars, publications, mail outs, flyers and mass media campaigns. Projects funded through the WRITE Program assist the Arizona Recycling Program in its mandate to provide recycling education to the public. For additional information on the WRITE Program or on the following projects, please contact the program coordinator at (602) 207-4865 or, toll free in Arizona, (800) 234-5677, Ext. 4865.

FY 2001 Waste Reduction Initiative Through Education Projects

The FY 2001 WRITE project funding was available to private businesses, non-profit organizations and governmental entities existing or servicing areas within Arizona. The Arizona Recycling Program awarded a total of \$138,595 to six recycling education projects. The funding was awarded in July 2000 and concluded in August 2001. Organizations awarded up to and including \$25,000 were required to match a minimum of 20 percent of the total project cost. Proposals requesting over \$25,000 were required to match a minimum of 35

percent of the total project cost. The maximum funding request was set at \$60,000. The following is a brief description of each proposal.

Environmental Education Exchange – Reduce-Reuse-Recycle Mission 3R Online

Neil Markowitz

Project Award \$20,000

P. O. Box 2630

Tucson, AZ 85702

(520) 670-1442

The Environmental Education Exchange (EEE) is a non-profit organization that provides programs and services to advance environmental literacy. EEE proposed a project that would add the animation and imagery of the previously WRITE funded Mission 3R software program to ADEQ's Web site or as a link to the Web site. This project provided the Arizona Recycling Program with an educational presence on the World Wide Web with the opportunity to offer information directly to the public through the Internet. The Mission 3R software program has been interactive and has the ability to teach users how to make more environmentally appropriate choices as to product size and packaging, make better choices on how to reduce, reuse and recycle materials and understand what happens to recycled materials after they are collected and how they are re-manufactured into new products. The funding would cover personnel costs for designing a series of Web pages that utilize new and existing imagery and animation of the Mission 3R software program. Bookmarks were printed and distributed to create awareness of the proposed Web site feature.

City of Glendale – RecycleFest 2001: A Carnival of Sorts

Joan Hickens

Project Award \$11,250

6210 W. Myrtle Ave., Suite 111

Glendale, AZ 85301

(623) 930-2619

The city of Glendale proposed to begin implementation of their residential curbside recycling during July 2000. In their efforts to design a successful recycling program, the city of Glendale proposed a public education program to proactively motivate residents to participate in the new curbside recycling program. The city of Glendale proposed a series of six events to be held in the city's parks during spring 2001. These events would provide city of Glendale staff the opportunity to speak directly with the residents on the issues of waste reduction, reuse, recycling, buying recycled products, composting and properly disposing of solid waste. In conjunction with neighborhood associations, the city of Glendale would schedule the events to include a variety of interactive stations that would educate, as well as entertain the public. The requested funding would be used for the associated costs in coordinating the outreach events, including the purchase of visual displays and entertainment services. The city of Glendale

planned to produce promotional materials and conduct a newspaper advertisement campaign that would create awareness of the scheduled events and reinforce information provided at the events.

Northern Arizona University – Environmental Education Outreach Program:

Protective Circle II

Mansel Nelson

Project Award \$57,076

Babbitt Administrative Center, Room 100

Knoles Dr., Building 51

Flagstaff, AZ 86011-4130

(520) 523-1275

The Environmental Education Outreach Program (EEOP) and the Institute for Environmental Tribal Professionals, located at Northern Arizona University, offer services to Native Americans that include technical, administrative and educational training. The EEOP and the Institute for Environmental Tribal Professionals proposed to implement a community-based education model that demonstrates how educators, students and tribal leaders can inform their communities by learning about source reduction, recycling, composting and sanitary landfills. Local Navajo chapter coordinators, elders, tribal leaders and educators would be trained in solid waste management techniques through a leadership workshop and an educators' workshop. The participants of the workshops would assist their communities in the adoption of a solid waste curriculum designed for their schools and communities. The Navajo Nation EPA expressed their support for the project. NAU requested funding for the coordination of various training workshops for the Navajo Nation leaders and educators and for the follow up workshops to be conducted at the local schools. Curriculum packets for the Navajo Nation educators and school libraries were also proposed in the project funding request.

City of Phoenix – Multi-Jurisdictional Recycling Education Campaign

Terry Gellenbeck

Project Award \$60,000

101 S. Central Ave.

Phoenix, AZ 85004

(602) 256-5607

The city of Phoenix in conjunction with the cities of Mesa, Glendale, Tempe, Chandler and the town of Gilbert formed the Multi-Jurisdictional Recycling Education Campaign Committee (MECC). The MECC proposed to develop a six month education campaign on general recycling awareness to run between November 2000 to May 2001. Prior to the formation of MECC, each jurisdiction developed and promoted their programs separately via internal and external media sources, which was very costly. Through MECC, the jurisdictions work together to develop various messages for each media that could be used

cooperatively, as well as individually. This cooperative effort would allow the recycling message to be received by a larger audience.

Sedona Recycles, Incorporated – Verde Valley Recycling Media Campaign
2280 Shelby Dr. Project Award \$28,840
Sedona, AZ 86336
(520) 204-1185

Sedona Recycles, Inc. was contracted by the Verde Valley Recycling Coalition (VVRC) to collect recyclables for the city of Cottonwood, the towns of Clarkdale and Camp Verde and the Yavapai County communities of Big Park/village of Oak Creek, the city of Cornville, Montezuma/Rimrock and Verde Village. The collection program started in January 2000, but the participation level was lower than expected. Therefore, Sedona Recycles Inc., in partnership with the VVRC, proposed to develop a comprehensive media campaign to inform and educate residents about the available recycling opportunities. The campaign would include newspaper, radio and television advertising and would be directed at those residents who do not currently recycle, as well as newcomers. Sedona Recycles, Inc. requested funding to produce a series of advertisements to run monthly in the local media. The VVRC supported the proposed project by assisting with the development of the advertising campaign and would provide the infrastructure for the public to gain recycling information in the local community.

City of Winslow – Waste Reduction: Education and Practical Applications
Dianne Henebry Project Award \$6,160
21 Williamson Ave.
Winslow, AZ 86047
(520) 289-4011

The city of Winslow proposed to develop an educational program for schools, businesses, clubs and the general public. Since the closure of the city's landfill, the public must haul their refuse to the Pen Rob Landfill, which is approximately 30 miles away. Many residents who are not contracting with the local solid waste hauler illegally dump their household waste. The goal of this education project is to educate the residents of Winslow on ways of reducing the amount of household trash that is generated. By working with the Chamber of Commerce, the community library and local schools, the city plans to increase awareness of waste reduction techniques and local recycling opportunities. Project funding was requested for the purchase of a computer, printer and monitor to be used for the production of presentation materials, such as a brochure and an activity book. Other items, including a tabletop display, easel and a folding table would be used for outreach events.

Public Education and Outreach Activities

The education that the Arizona Recycling Program has offered since 1990 has benefitted non-profit organizations, private companies, governmental agencies and the general public. The benefits have been received through the direct and indirect effects of recycling and source reduction workshops and conferences, demonstrations of products made from recycled materials and the distribution of recycling education throughout the state.

The Arizona Recycling Program focuses on public education to encourage participation in source reduction, reuse and recycling of solid waste. Although the fundamentals of recycling education are often centered around the implementation of the 3Rs (reduce, reuse, recycle), the Arizona Recycling Program also identifies techniques that will enhance waste reduction efforts. These techniques include educating the residents of Arizona about the importance of buying products made from recycled materials, properly disposing of household hazardous waste, composting and preventing illegal dumping. When the Arizona Recycling Program communicates the importance of recycling, it is presented as a solid waste management option with the ability to conserve our natural and economic resources, reduce the need for new landfills, reduce pollution and create economic support for the recycling industry.

In addition to the WRITE funded projects that are described above, the Arizona Recycling Program administered various recycling education projects throughout the past year. According to A.R.S. § 49-833 B., the Arizona Recycling Program is required to provide public education through the methods discussed below.

Recycling and Source Reduction Techniques Educational and Technical Assistance Opportunities

During FY 2001, the Arizona Recycling Program provided educational and technical assistance to jurisdictions, businesses and the general public through the distribution of brochures, manuals, "how-to" guides, case studies of specific recycling source reduction programs and other related educational materials. Information for both the WRA and WRITE Programs is provided through presentations to initiate and/or support the establishment of waste reduction and recycling programs. The Arizona Recycling Program provided on-site assistance to schools and businesses to initiate waste reduction options when working with waste haulers and conducting waste audits.

The structure of the state's recycling efforts are community-based. Many jurisdictions offer recycling as part of their solid waste management program. However, if a jurisdiction does not have the infrastructure to offer recycling collection, non-profit organizations have assisted and organized grassroots recycling drop-off programs. In order to provide detailed information to the public regarding community-based recycling programs, the Arizona Recycling

Program maintains a listing of local contacts, titled *Public Recycling Program Coordinators List*. A copy of this list can be located on our Web page at www.adeq.state.az.us/environ/waste/solid/download/coords.pdf. This list provides points of contact for 102 jurisdictions throughout Arizona. The Arizona Recycling Program works with the recycling coordinators to provide assistance with their recycling efforts, coordinate between other jurisdictions (if necessary), develop educational materials and exchange knowledge of available recycling opportunities. For general public inquiries, the Arizona Recycling Program provides an overview of the statewide recycling efforts and how they correlate with a specific community's efforts. However, if community-specific information, such as a current list of accepted recyclables or a schedule of pick-up days are requested, the public is encouraged to call their designated recycling coordinator.

When residential curbside recycling programs are not available to households or apartment complexes, the Arizona Recycling Program advises the public to create their own system of collecting recyclables at home and locating a nearby recycling drop-off site. In addition, residents are encouraged to call 1-800-CLEANUP or visit www.cleanup.org, a statewide recycling hotline and Web site, to locate the closest drop-off site for their recycling needs.

To increase the awareness of household hazardous waste (HHW) disposal locations, the Arizona Recycling Program continues to update a referral listing of locations within each county. This listing includes transfer stations, local businesses, special HHW collection events and permanent HHW facilities that will accept used paint, motor oil, antifreeze, batteries and other types of HHW for reuse or proper disposal options. In addition to the referral list, the Arizona Recycling Program recommends other waste reduction and reuse options for HHW. For example, old paint can be donated to neighbors, theater groups or beautification projects that use old paint to cover up graffiti. Used oil and antifreeze can be returned to most automotive parts and supply stores. The Arizona Recycling Program has referred businesses with larger quantities of batteries, fluorescent lights and solvent-based products to the hazardous waste handlers in the area. The Arizona Recycling Program also encourages communities that lack the opportunity to properly dispose of HHW to apply for funding assistance to institute HHW events or permanent facilities.

Technical Workshops and Seminars on Recycling and Source Reduction

The Arizona Recycling Program cooperatively worked or contracted with other agencies, non-profit organizations and/or funding recipients to sponsor or co-sponsor workshops and conferences as a means to provide recycling and source reduction program guidance.

The Arizona Recycling Program co-sponsored the following workshops and seminars in FY 2001.

Recycling Coordinator's Training Workshops

The Arizona Recycling Program co-sponsored the Southwest Public Recycling Association's, *Recycling Coordinators' Training Workshops*. The workshops were held on Nov. 2 and 3, 2000 in Casa Grande, and Nov. 7 and 8, 2000 in Sedona. The workshops provided local communities, private businesses and non-profit organizations with the tools and information they need to create, develop and expand efficient and sustainable recycling operations.

Northern Arizona University's Protective Circles II: The Teachers Workshop

The Arizona Recycling Program co-sponsored the *Protective Circles II: The Teachers Workshop* on Dec. 8 and 9, 2000 at Northern Arizona University, Flagstaff. The workshop provided tribal educators and others with waste reduction and recycling education information. The participants had hands-on activities dealing with waste management, recycling, source reduction and composting. Curriculum and science kits were distributed.

Northern Arizona University's Navajo Nation's Solid Waste Management Program Recycling Workshop

The Arizona Recycling Program co-sponsored the *Navajo Nation's Solid Waste Management Program Recycling Workshop* on Oct. 25-27, 2000 at the Radisson Woodlands Inn, Flagstaff. The workshop increased tribal awareness of solid waste issues and solutions. Tribal and chapter leaders, council delegates and interested community leaders were invited to participate in discussions regarding recycling, sanitary landfills, composting methods and wildcat dumping.

Recycling and Source Reduction Database and Hotline

As stated in A.R.S. §49-833 B.3, the Arizona Recycling Program is required to administer a recycling and source reduction database and hotline that provides referral services to waste generators. Since 1990, the Arizona Recycling Program has been compiling a database of recycling facilities and drop-off locations for Arizona residents to refer to for their recycling needs. Developing, updating and maintaining a database has been an on-going project for the Arizona Recycling Program. Outreach events, such as site visits and regional conferences, create the opportunity for staff to acquire information on new and existing recycling facilities to add to the database.

From 1992 through 2000, the Arizona Recycling Program has worked with Cleanup, Inc., d.b.a. the Environmental Recycling Hotline (also known Earth's 911), to make this recycling database available to the public. By uses the 1-800-CLEANUP phone number and Web site, the Arizona Recycling Program fulfills the statutory requirement of administering a database and hotline.

In Arizona, many communities do not have the opportunity to participate in residential curbside recycling programs. By promoting the use of the hotline system, the Arizona Recycling Program has increased the public's knowledge of local area waste reduction efforts and recycling drop-off sites.

The Arizona Recycling Program continues to distribute promotional items such as magnets, pencils, rulers and educational wheels that contain the hotline's phone number and Web site. These items are distributed at outreach events to encourage to the public to use the hotline for recycling and environmental information.

In January 2001, a revised contract was established between the Arizona Recycling Program and Cleanup, Inc. to focus on promotional work emphasizing the use of the hotline phone number and Web site. The promotional campaign designed as part of this contract will focus on waste reduction and recycling education in the rural communities.

The hotline started as a computerized interactive phone system that provided the locations of local drop-off facilities based on a five-digit zip code. Callers could access several sections of information, including the nearest recycling center, information on household hazardous waste, ways to reduce, reuse and recycle, and purchasing products made from recycled materials.



The Arizona Recycling Program supported the Environmental Recycling Hotline in a variety of ways. In 1992, a memorandum of understanding initiated Arizona as the first state to support the Environmental Recycling Hotline phone number and its concept of empowering the public with the tools necessary to locate recycling drop-off locations, and have access to environmental tips regarding source reduction, reusing and recycling. Initially, the Arizona Recycling Program provided funding support to assist with the cost of the phone lines.

As the hotline system advanced, the Arizona Recycling Program provided funding for promotional and educational efforts to increase public awareness for the Environmental Recycling Hotline services. Subsequent funding also provided for a part-time staff person at Cleanup, Inc. to update the statewide recycling drop-off locations on the hotline database.

Through the years, other organizations provided support to Cleanup, Inc. to form a public/private partnership that now includes local and national sponsors offering financial, technical, and promotional assistance. With the support of

both the public and private sectors, this interactive phone and Internet system has grown in its capacity to operate free to the user.

In 1995, EPA awarded Presidential Environmental Technology Initiative (ETI) Grant funding to ADEQ to provide Cleanup, Inc. with assistance for the expansion of the Hotline program nationwide. As this nationwide expansion took place, residents in each state were able to dial the 1-800-CLEANUP phone number to receive referral services for their community.

The Environmental Recycling Hotline, also known as Earth's 911, has since created a Web site (www.cleanup.org) to allow Arizona and all other states to customize information for access through the Internet. Specific environmental numbers and hotlinks on the Web site can be tailored for each community. A virtual library has been developed to house all of the promotional materials. These materials are available to any organization.

Promoting Recycling and Use of Recycled Products

Each new year seems to generate more interest in environmental education and awareness. The number of calls received from the public increased and the number of requests for recycling presentations followed suit. During FY 2001, the Arizona Recycling Program participated in numerous outreach events to promote recycling, waste reduction and the use of recycled products. The Arizona Recycling Program traveled to local schools to talk with children in kindergarten through 12th grade levels about recycling. Recycling presentations were also made during conferences and civic group meetings. Each presentation covered the basic message of reduce, reuse, recycle and buy recycled.

Recyclable materials are often brought to the presentations to demonstrate which materials can be recycled in their community and why those materials may differ from community to community. The standard recycling symbols, illustrated below, are often times, used to indicate the recyclability of certain types of packaging. The three chasing arrows (Figure 3) refer to packaging that is recyclable. The three chasing arrows enclosed in the black box (Figure 4) represent packaging that is made from recycled materials and is usually accompanied with the percentage of recycled content material used in the remanufacturing. The differences between the symbols are explained in presentations and pointed out on the actual products.

Figure 3

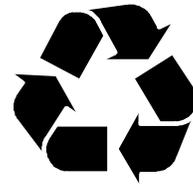
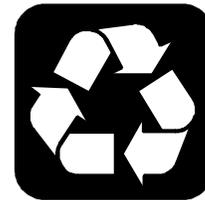


Figure 4



Recycled content products such as carpet made from recycled plastic soda bottles and playground equipment made from recycled plastic milk jugs are showcased at these presentations to increase recycled product awareness. The concept of

buying recycled products is emphasized to illustrate that recycling not only includes the collection and sorting of recyclables, but it also includes the remanufacturing of recycled products that need to be purchased by the public in order to close the loop of recycling. The audience is provided with an explanation of the many benefits of reducing, reusing and recycling.

Promotional items, such as rulers, pencils, bookmarks, brochures and stickers made from recycled materials, have been distributed in classrooms to further demonstrate the availability of these products. Most of these items contain the 1-800-CLEANUP hotline phone number for future reference.

Outreach Events Promoting Recycling

America Recycles Day

Since 1997, America Recycles Day has been nationally celebrated on Nov. 15. This year's theme, "For Their Future, Buy Recycled Today," focused on building consumer demand for recycled products and to continue to educate others on the environmental and economic benefits of recycling. People were asked to purchase recycled-content products and recycle more by completing a pledge card with their name, address and how they would make a change in their daily routine. All the pledge cards were forwarded to Washington, D. C. where a national drawing for the children's prizes was held. Winners from this year's event won a trip for four to Disney World. The adult grand prize drawing will combine pledge cards collected from last year and this year's contest. The grand prize is the American Green Dream House that is constructed out of recycled content and energy efficient materials. The winner could have the home built anywhere in the United States.



State recycling organizations were encouraged to lead statewide efforts in conjunction with America Recycles Day by getting communities involved in recycling events, contests, races and activities designed to promote awareness about recycling and buying recycled content products. A total of 44 states, the District of Columbia, two territories and Mexico participated.

Promotion of the Fourth Annual Arizona/America Recycles Day included statewide advertisements in local newspapers, on-site promotions and contests. In addition, Nov. 15 was declared Arizona/America Recycles Day by Governor Jane Dee Hull. The Arizona/America Recycles Day prompted nearly 10,000 Arizonans to pledge to buy recycled products.

Earth Day 2001

The Arizona Recycling Program celebrated Earth Day 2001 by traveling to events located throughout the state during the month of March and April. The promotional events were planned and coordinated by jurisdictions, non-profit organizations and elementary schools. The Arizona Recycling Program participated in the events through an interactive display of products made from recycled materials. Events included Earth Day celebrations at Boyce Thompson Arboretum, Valley Forward's Earth Fest, Women's Expo, Maricopa County Fair, city of Phoenix's Sunday on Central, Glendale Community College, Big Sandy Natural Resource Conservation District in Kingman, Lake Havasu State Park, University of Arizona and numerous classroom presentations.

Computer Recycling – StRUT

The Arizona Recycling Program partnered with Valley-wide public jurisdictions, non-profit organizations and local businesses to promote the Students Recycling Used Technology (StRUT) Earth Day Computer Recycling Collection Event. Valley residents were invited to donate their old and obsolete computers and equipment, such as monitors, printers and CPUs to the StRUT program to be refurbished for use by non-profit organizations and schools. The event hosted collection efforts at various drop-off sites throughout the Valley, at which over 1,600 residents dropped off over 9,600 computers and related equipment to be refurbished or recycled.

Electric Light Parade

The Arizona Recycling Program, city of Phoenix, A to Z Rentals, United States Forest Service and Urban Forestry sponsored a float in the 2000 Arizona Public Service's Fiesta of Lights Electric Parade. The float, "**Christmas Treecycling**" was adorned with over 12,000 lights, a steel drum band, a dozen cut and potted Christmas trees and mascots from the city of Phoenix, United States Forest Service and Urban Forestry. Over 24,000 Christmas Treecycle tags were distributed along the three mile parade route. The Christmas Treecycling red tag program was promoted in most communities statewide.

Grocery Bag Reuse Project

For a second year, the Arizona Recycling Program worked with local grocery stores and the *Bear Essential News for Kids* publication to promote the reuse of paper grocery bags. Teachers were encouraged to borrow paper grocery bags from their local grocery store to provide to their students for decorating. The students creatively decorated the bags with an Earth Day message to show that kids care about the environment. Teachers returned the decorated bags to the grocery stores, and on Earth Day (April 22), customers received their groceries in the bags. As in the past, the project alerted students and grocery store patrons of the benefits of reducing trash through reusing and eliminating the need for new grocery bags.

Quarterly Recycle Arizona Newsletter

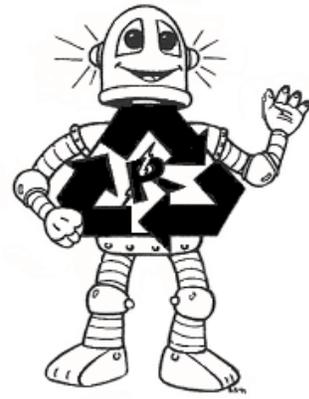
The Arizona Recycling Program has developed its own quarterly newsletter, *Recycle Arizona*. The newsletter contains information on the WRITE and WRA Programs, a description of projects recently awarded funding, America Recycles Day, Christmas Treecycling, Earth Day activities, upcoming events and other related statewide recycling information.

The Arizona Recycling Program works cooperatively with other newsletters, including the Arizona Department of Education's *Education Express*, ADEQ's *Trash Talk* and *The Arizona Environment* and the Arizona Recycling Coalition's *The Inside Loop* to promote recycling and waste reduction activities in Arizona.

Bear Essential News for Kids

In October 1999, the Arizona Recycling Program began working with the publication, *Bear Essential News for Kids*, to develop a twelve month series of lesson plans for elementary students. "Recyclebot," the Arizona Recycling Program's mascot, was specifically designed to teach waste reduction habits to a younger generation of earth-friendly crusaders.

The full page design includes a masthead entitled "Recycle Arizona," and features new exercises each month that teach the concepts of reducing, reusing, precycling, recycling, composting and buying recycled products. Response to the "Recycle Arizona" page has been measured through mail-in surveys and through phone inquiries. The elementary students make up the primary audience, while teachers and parents are indirectly targeted. Teachers are able to obtain recycling ideas for classroom projects and parents are exposed to the information when they read the publication with their children.



Arizona Recycling Program's
Recyclebot

Recycling and Source Reduction Public Education and Advertising Programs

The Arizona Recycling Program, through the WRITE Program, has funded many recycling education and awareness programs that have been successfully implemented throughout Arizona. Often, communities do not have the financial or personnel resources available to produce recycling education materials. The Arizona Recycling Program has been able to assist these communities with various curricula and outreach materials at little or no cost.

Recycling education resources funded through the Arizona Recycling Program are required to be transferrable to other communities to support recycling and/or

waste reduction efforts. The Arizona Recycling Program has developed an inventory of fact sheets, brochures, video tapes, manuals and slides that have resulted from previously funded projects that are available to schools, municipalities, non-profit organizations and the general public. This inventory list provides the Arizona Recycling Program with an understanding of what is currently being used for the purpose of promoting recycling and what will need to be developed in the future. This inventory has been added to the Arizona Recycling Program's Web page for the public to access (www.adeq.state.az.us/enviro/waste/solid/recycle.html).

The Arizona Recycling Emblem

The Arizona Recycling Emblem is comprised of a cactus with the three chasing arrows, an oval frame that surrounds the cactus, and bears the slogan "Arizona Cares: Reduce, Reuse, Recycle." It provides a recognizable symbol for recycling efforts and education within the state. To promote the use of the Arizona Recycling Emblem on a continual basis, the Arizona Recycling Program encourages other recycling organizations to use the emblem to create a uniform look for Arizona's recycling image. When possible, promotional items, such as rulers, pencils, pens, lapel pins and stickers, include the Arizona Recycling Emblem.



Waste Reduction Curriculum Software Program

In 1996, the Arizona Recycling Program awarded a grant to the Environmental Education Exchange to create a computer software program for students in grades four through six. The software program titled *Mission 3R* is an entertaining, hands-on program that encourages students to reduce the waste generated, to buy recycled products, recycle as much as possible and compost organic matter. This software is designed to score the student's choices and provide a grade at the end of the game.

In June 1998, the Arizona Recycling Program contracted with the Environmental Education Exchange to upgrade the technical animation and audio segments of the program, as well as to change the four-disk installation to a CD-ROM. The revised *Mission 3R* CD-ROM was completed in July 2000 and is available for distribution. To date, over 2,000 copies of the CD-ROM have been distributed to schools statewide.

Arizona Department of Commerce's Recycling Market Development Program

The Arizona Recycling Program provides funding for the Arizona Department of Commerce's Recycling Market Development Program, which develops local recycling markets for Arizona's recycling programs and assists in the creation of

jobs and capital investment by recycling-based businesses. Specifically, the program encourages the use of recycled materials as a manufacturing feedstock by new and existing Arizona businesses, attracts recycling-based businesses to the state and assists existing Arizona recycling-based companies in their business expansions. To accomplish these goals, the program works closely with public, non-profit and private economic development and recycling officials.

Arizona Recycling Market Development Program Background

Since 1994, the Arizona Recycling Market Development Program has assisted numerous recycling-based businesses that have located new plants or expanded existing operations in Arizona. These companies have created over 2,200 jobs and their combined capital investment exceeds \$387 million.

The Arizona Recycling Market Development Program was launched in 1992 with the passage of Senate Bill 1287, which created a recycling market development program housed jointly by the Arizona Department of Commerce and the Arizona Recycling Program. The program is funded by a portion of the \$.25 per ton landfill user fee surcharge.

In 1993, the state legislature adopted the Arizona Environmental Technology Bill (A.R.S. 41-1514.02) creating the Environmental Technology Office and providing significant tax benefits to large recycling companies that committed to an Arizona location through mid-1996. In 1994, The Arizona Department of Commerce was awarded a Jobs Through Recycling Grant from EPA to support the state's recycling market development efforts.

Jobs Through Recycling Grant monies were used to fund the 1996 Arizona recycling market development study, which was jointly funded by EPA, the Arizona Recycling Program and The Arizona Department of Commerce. The study was the first of its type in the nation to provide comprehensive information on the growth and development of a statewide recycling economy. The study provided baseline information designed to assist in the attraction of key recycling businesses and to help existing operations expand in Arizona. According to the study, Arizona's recycling industry contributed more than 500 million dollars to the state's gross state product in 1995. During the same year, the recycling industry also accounted for \$616 million in direct capital investment and 3,427 direct jobs.

In 1996, The Arizona Department of Commerce received a second Jobs Through Recycling Grant to promote targeted recycling business development in rural and economically depressed areas of the state. The Arizona Department of Commerce received its third Jobs Through Recycling Grant in late 1998 for the Rural Recycling Business Initiative. This project, which will be completed in late 2001,

will provide the information necessary to establish recycling businesses in rural and tribal areas of the state. Specific development tools will include geographic information databases, on-line and printed media that will identify and link regional waste streams, eco-industry sites and sources and users of recyclable materials. Tools will be posted on the Web and marketed to assist local economic developers, attract new industries and help to mentor similar efforts across the country.

In FY 2001, an update of the 1996 Arizona recycling market development study was undertaken. The report will provide an update on the economic impact, in terms of jobs, capital investment, etc. of recycling in Arizona.

As a result of ongoing financial support from and a strong partnership with the Arizona Recycling Program, along with EPA funds to augment the program's budget, Arizona's recycling market development program is considered a model throughout the country.

Conference and Project Sponsorship

Regional Recycling Forums in Winslow and Yuma

The Arizona Department of Commerce co-sponsored two Arizona Recycling Coalition regional recycling forums held Oct. 6, 2000 in Yuma, Ariz. and March 16, 2001 in Kingman, Ariz. The forums covered existing regional recycling programs, collection options, markets and infrastructure and recycling market development issues. The forums drew about 60 participants, who ranged from private recyclers to public recycling officials.

Rural Recycling Business Initiative

Many rural communities have begun to request individual recycling market development assistance from The Arizona Department of Commerce. Adequate technical and planning assistance is difficult to provide to all rural areas of the state. Further, some individual rural communities lack the resources to attract recycling industry, and are often unaware of suitable waste streams in their own region which could be used as a manufacturing feedstock.

To meet this need, this EPA-funded project is designed to assist in the development and attraction of sustainable recycling-based businesses in rural and economically disadvantaged communities in Arizona. This web-based business development tool, which will be housed on the Arizona Recycling Coalition's Web site, will be launched shortly. Information on waste stream, waste diversion, existing recycling companies and community profiles will be provided for a majority of rural Arizona communities.

Recycling Market Development Study Update

A \$50,000 grant was awarded to R.W. Beck to update the 1996 recycling market development study and will be completed in FY 2002. Commerce is administering the study, with funding from the Arizona Recycling Program. The purpose of the study is to conduct an updated economic assessment of the impact of the recycling market development infrastructure on Arizona employment, income and tax base. This year's study will also survey manufacturers for input on state recycling incentives and policy.

Plastics Redesign Project

Support was provided to a national research effort on plastic bottles that will support the recycled plastics market and specifically provide needed information to recycled plastics processors and plastic bottle manufacturers. Specific work includes:

- , Analysis on the physical properties of a plastic beer bottle that are compatible with current (or readily adaptable) recycling systems
- , Analysis of the "all bottles" plastics collection program with a focus on whether the system increases contamination for processors
- , An econometric analysis that is intended to find a win-win resolution of the debate over increasing recycled content in beverage and food contact PET bottles and will estimate whether that optimizing percentage of recycled content affects the overall price for plastic bottles
- , Work with the consumer products industry and vendors of bottles that manufacture specific types of plastic bottles to increase their usage of recycled content and encourage production of recyclable containers

Marketing and Outreach

The Arizona Recycling Market Development Program worked with a consultant to survey existing collectors, processors, brokers and end users of recycling materials. The survey data is used to calculate the state's recycling and diversion rates.

In addition, Arizona Recycling Market Development Program staff participated in the following events to promote recycling market development efforts in Arizona and highlight the state as an ideal recycling business location:

- , National Recycling Coalition – Charlotte, NC
- , Governor's Rural Development Conference – Sedona, Ariz.
- , National Recycling Market Development Roundtable – Chicago, Ill.
- , Arizona Recycling Coalition Rural Recycling Roundtables – Sierra Vista and Yuma, Ariz.

Program staff also visited numerous local communities, both urban and rural, and

tribal nations to educate and assist local economic development officials and community members in their recycling economic development efforts.

Administration

During FY 2001, the Arizona Recycling Market Development Program received \$91,953 from the Arizona Recycling Program to administer the program and \$50,000 to fund specific projects.

Business Development and Technical Assistance

The Arizona Recycling Market Development Program provided a wide range of assistance to over seventy companies and entrepreneurs during this past fiscal year. Assistance included: site location assistance, identification of financing options, permitting assistance, recyclable supply stream analysis, networking, market research and cost of doing business in Arizona and incentives information. Eight of these companies announced the relocation or expansion of their business into Arizona or expansion of existing Arizona operations. They will create 225 new jobs in the state within three years and make capital investments exceeding \$44 million. In addition, these businesses will divert over 63,000 tons of secondary material from Arizona's landfills annually. Recyclables handled by these companies include fiber (paper), tires, organic material, coal combustion waste, metals, plastics, glass and wood. The companies include:

Arizona Paper Shredding – This paper shredding and recycling business expanded and moved its operations to a new facility in Phoenix.

Copper Consulting Industries – A major reprocessor of copper scrap, this Glendale company expanded operations at a new facility.

Enviroc – This start-up company will produce autoclaved aerated concrete wall panels and floor panels for use in residential, commercial, industrial, institutional and public works construction near Kingman, Ariz. Coal combustion wastes will comprise a significant percentage of the manufacturing raw material.

GreenFiber LLC – A cellulose insulation manufacturer, this company is a result of a merger between US Fiber and Greenstone. The operation is located in Phoenix. GreenFiber is a major consumer of phone directories.

Hudson Baylor (River Recycling LLC) – This company will locate a material recovery facility on the Salt River Landfill, operated as an enterprise of the Salt River Pima-Maricopa Indian Community. The facility will be capable of handling 350 tons of residential and commercial commingled recyclables daily from communities including Scottsdale and Mesa.

LB International – A manufacturer of PureBlaze firelogs, made from recycled paper and wood, this company moved and expanded its operations in Winslow, Ariz. They are in the process of developing an eco-industrial park focused on using waste wood.

Mattera Enterprises Recycling/Discount Dumpster Services – A construction and demolition © and D) debris recycling facility, adjacent to a new C and D landfill, Iron King Waste Reduction Facility, in Humbolt, Ariz. The facility will sort cardboard, plastic, mixed paper, metal and wood debris for recycling.

LandStar (formerly PolyTek Rubber & Recycling) – This Queen Creek, Ariz.-based tire recycler retrofitted the former PolyTek manufacturing operation with their proprietary Activated Modified Rubber devulcanization process.

FY 2002 Projects

Goals

- , Continue to provide leadership in establishing a “critical mass” of recycling-based industries in Arizona
- , Facilitate the growth and development of complimentary industry clusters that recycle and reuse waste streams, especially in rural areas
- , Act as a clearinghouse for information and contacts to enhance recycling market development efforts in Arizona
- , Work to identify and expand supplies of recyclable raw materials for existing and new businesses
- , Coordinate with other organizations to help small recycling-based businesses access capital

Objectives

- , Trade shows and conferences
 - National Recycling Congress
 - SPRA Southwest Market Development Conference
 - Biocycle West Coast Conference
 - Waste Expo
 - Arizona Recycling Coalition Conference
- , Based on results of recycling economic impact study, develop marketing piece for recycling industry in Arizona; through press releases and articles, promote results of study in recycling and solid waste trade publications
- , Assist Bullhead City’s Windy River Institute and LB International in Winslow as they develop eco-industrial park concepts and assist Flagstaff in the marketing of their business incubator
- , Meet with and tour facilities of top 25 recycling businesses in Arizona

- and survey recycling businesses to determine their needs and receive input on topics such as sources of materials, access to capital
- , Urge the Arizona Recycling Program to continue to provide research and development funding to recycling businesses, identify state university and community college research and development capabilities in environmental technology field and transfer information to appropriate companies
 - , Complete the EPA Jobs Through Recycling Rural Recycling Business Initiative project and use the information provided through the project's Web-based database to encourage rural eco-industrial parks and businesses that utilize industrial and agricultural wastes
 - , Complete update of the recycling economic impact study
 - , In conjunction with the Arizona Recycling Program, secure funding, identify contractor and begin development of the Arizona Recycling Market Directory, which will list processors and manufacturers in Arizona and serve as a source of information for collectors, processors and end users of recyclables
 - , Co-sponsor two rural recycling economic development training sessions in conjunction with the Arizona Recycling Coalition
 - , Continue to work with valley-wide recycling coordinators to expand their collection of recyclable materials (residential, multi-family and commercial) for use by Arizona recycling-based businesses and work with the city of Tucson to convert from twice monthly recycling collection to automated once a week recycling collection
 - , Assist in the planning and development of the Arizona Recycling Coalition's spring 2002 annual conference
 - , Promote services and identify leads through regular attendance at:
 - Arizona Recycling Coalition events
 - Arizona Association of Industries' meetings
 - Environmental technology industry cluster events
 - Maricopa Association of Governments Solid Waste Advisory Committee meetings

Used Oil Recommendations

The recycling program is required by A.R.S. §49-832.C. to include recommendations on the feasibility of maximizing the use of re-refined oil for state lubrication needs, and the state's use of used oil as the oil feedstock of re-refiners. ADEQ obtained the lubrication information from *Re-refined Oil*, published by the Buy Recycled Business Alliance, 1996.

Use of Used Oil for the State's Lubrication Oil Needs

As was first reported in the 1996 recycling program's annual report, automobile warranties do not prohibit the use of re-refined (recycled) oil for engine lubrication. Auto manufacturers and the oil industry do not distinguish between re-refined oil and virgin oil. Many brands of lubricating oil are sold in containers that indicate a portion of the oil is re-refined by displaying the recycled content symbol. However, as there is no recognized distinction between re-refined and virgin oil, re-refined oil may be purchased in a container that does not identify its contents as re-refined. Therefore, consumers may be purchasing recycled content oil without realizing it.

Guidelines set by the American Automobile Manufacturers Association, the American Petroleum Institute, the Society of Automobile Engineers, the American Society of Testing Materials and the Chemical Manufacturers Association do not distinguish between re-refined oils and virgin oils. In addition, all three major United States automobile manufacturers (Ford, General Motors and Chrysler) recognize that re-refined oils meet the performance criteria in their warranties. Engine oils must be licensed indicating that they meet the current American Petroleum Institute (API) designations to guarantee performance and a valid warranty on the car's engine. Consumers must look for the API donut or the starburst symbol on the oil container to be sure the oil they are purchasing meets warranty standards.



The American Petroleum Institutes donut and starburst symbols: lubricant packages displaying these symbols meet all auto warranty standards.

Though foreign auto makers, as a group, have not officially announced they recognize the use of re-refined oil for lubricating needs in their products, foreign manufacturers do not prohibit its use. In fact, Mercedes Benz installs re-refined oil in every new car manufactured in Germany and South Carolina. The cost of re-refined oil has become competitive with virgin oil. In 1994, the United

States Postal Service used re-refined oil in 105,600 vehicles and saved up to five cents per gallon. Re-refined oil now exists that: 1) meets the warranty requirements of automobile manufacturers, and 2) has become competitive in price with virgin oils. With this in mind, the recycling program encourages the continued use of the API licensed re-refined oil as a lubricant in the state's fleet vehicles and its use by the public at large.

Use of This State's Used Oil by Re-refiners or as a Lube Stock

Quarterly and annual reports submitted to ADEQ's Solid Waste Section from the

used oil industry in Arizona indicate that 20,170,000 gallons of used oil were collected during the 2000 calendar year. This is an increase of 22 percent over the 1999 calendar year, but only a five percent increase over the 1998 calendar year. It is believed that the large increase over the previous year is the result of poor reporting from the used oil industry for 1999. However, the five percent increase over the past two years is consistent with the growth rate of Arizona's population.

The industry re-used approximately 12,260,000 gallons of used oil in Arizona. Table 7 provides a breakdown of the uses of the recovered oil. The vast majority of this, 12,220,000 gallons, was burned in asphalt and concrete production and energy recovery. Table 8 provides a breakdown of the used oil burned for energy. The remaining 40,000 gallons were recycled as form oil, which is used to lubricate the inside surface of forms and molds, and to shape concrete structures in the construction industry. Therefore, since burning is not considered recycling in Arizona, 2 percent of the oil collected in Arizona was recycled within the state. Table 9 provides a breakdown of the recycled used oil. The Arizona used oil industry exported approximately 7,910,000 gallons of used oil to California, Indiana, Kansas, Oklahoma, Nevada, New Mexico and Texas. Burning, including the use of the oil as bunker fuel, consumed 3,740,000 gallons, while 4,170,000 gallons were recycled by re-refining the oil for lubrication applications. Therefore, a total of 4,210,000 gallons collected from sources in Arizona were recycled. This results in a recycling rate for used oil of 21 percent. This recycling rate is more than double the previously high rate of 10.2 percent for 1997, and almost three times the 7.7 percent rate for 1999. The significant increase is the result of much more used oil being exported to Indiana for recycling.

Table 7. Used Oil Recovered in Arizona that was Recycled

	Re-Refiners	Form Oil	Recycled Total
Arizona		40,000	40,000
California			
Indiana	4,170,000		4,170,000
Kansas			
Oklahoma			
Nevada			
New Mexico			
Texas			

Total			4,210,000
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Table 8. Used Oil Recovered in Arizona that was Burned for Energy Recovery

	Burned	Bunker Fuel	Diverted Total
Arizona	12,220,000		12,220,000
California		670,000	670,000
Indiana			
Kansas	40,000		40,000
Oklahoma		500,000	500,000
Nevada	30,000		30,000
New Mexico	2,330,000		
Texas		170,000	
Total	14,620,000	1,340,000	15,960,000

Table 9. Uses of Used Oil Recovered in Arizona

	Recycled Total	Diverted Total	Total
Arizona	40,000	12,220,000	12,260,000
California		670,000	670,000
Indiana	4,170,000		4,170,000
Kansas		40,000	40,000
Oklahoma		500,000	500,000
Nevada		30,000	30,000
New Mexico		2,330,000	2,330,000
Texas	162,428	170,000	170,000
Total	4,210,000	15,960,000	20,170,000

Recycling Opportunities, Impediments and Disincentives

The Arizona Solid Waste Recycling Act of 1990 (A.R.S. §49-832.C.6.) requires that recycling opportunities impediments and disincentives be reported annually. This section relates the most common of these mentioned by respondents to the FY 2001 annual waste reduction and recycling questionnaire. Opportunities that will be discussed first may be useful to communities considering the implementation of a recycling program. The impediments and disincentives are closely monitored by the recycling program to direct resources toward problems that inhibit the growth of recycling in the state. It is important to note that this information is subjective and reflects the opinions and experiences of the respondents.

Opportunities that Encourage Recycling

The exceptional opportunities for recycling are existing programs, special collection events and community involvement and support. A complete list of the stated opportunities and incentives, as well as a list of the reporting jurisdictions, is provided in Table 10. In the table, the number of jurisdictions identifying each opportunity is given in the middle column. The jurisdictions identifying the opportunity are given in the right column.

Existing Program Opportunities

The most frequently identified opportunity or incentive to recycle is the availability of existing programs. Jurisdictions stated that curbside pickup, drop-off sites, white goods collection and greenwaste collection programs provided the greatest opportunity for their community to recycle.

Special Collection Events

Another identified opportunity or incentive to recycle is the availability of special collection events. The Christmas tree collection and household hazardous waste (HHW) collection events are great ways to get the community involved with recycling. The communities also benefit from these events. Many of the Christmas trees that are collected are shredded to produce mulch for the community. Paint and used oil collected at HHW events are reconditioned and donated locally for reuse. Several communities provide annual and monthly curbside pickup events in an effort to provide an opportunity for their residents to recycle.

Community Involvement Program

The community involvement program uses literature to increase the awareness of recycling opportunities available locally. Communities programs like timeshare volunteers, recycling buy back, office recycling and multi-family recycling allow residents to be involved in recycling activities.

Table 10 lists opportunities and incentives to recycle in Arizona as identified by local jurisdictions within the state. The number of jurisdictions identifying each opportunity is given in the middle column. The jurisdictions identifying the opportunities are given in the right column. Subcategories are given if several jurisdictions identify similar opportunities or incentives.

Table 10. Opportunities and Incentives to Recycle in Arizona as Identified by Local Jurisdictions Within the State		
Opportunity or Incentive	No.	Jurisdictions
Program Type		
Curbside programs	31	Carefree, Chandler, Chino, Coolidge, Cottonwood, Flagstaff, Gilbert, Gold Canyon, Holbrook, Kearny, Lake Havasu, Mammoth, Marana, Mesa, Nogales, Oracle, Patagonia, Payson, Peoria, Phoenix, Prescott, Riverside, San Manuel, Scottsdale, Superior, Tempe, Tucson, Williams, Coconino County, Pima County, Pinal County
Greenwaste collection	20	Chandler, Cottonwood, Douglas, Flagstaff, Florence, Goodyear, Holbrook, Kingman, Litchfield Park, Mesa, Patagonia, Peoria, Phoenix, Scottsdale, Somerton, Tempe, Willcox, Yuma, Navajo County, Pima County
Recycling drop-off	15	Chandler, Douglas, Florence, Goodyear, Holbrook, Lake Havasu, Mesa, Patagonia, Peoria, San Luis, Tucson, Winslow, Apache County, La Paz County, Santa Cruz County
Tire collection/drop-off	7	Florence, Scottsdale, Graham County, Navajo County, Pima County, Pinal County, Yavapai County
Appliance drop-off/pick-up	5	Florence, Holbrook, Patagonia, Coconino County, Gila County
Mobile recycling	5	Arizona City, Goodyear, Mesa, Queen Creek, Pinal County
Weekly pickup	5	Coolidge, Florence, Mesa, Peoria, Apache County

Table 10. Opportunities and Incentives to Recycle in Arizona as Identified by Local Jurisdictions Within the State		
Opportunity or Incentive	No.	Jurisdictions
Transfer stations	4	Prescott, Coconino County, Pima County, Yavapai County
Used oil recycling	3	Florence, Patagonia, Apache County
Daily pickup	2	Coolidge, Florence
<i>Offering Organizations</i>		
Non-profit organizations	10	Coolidge, Florence, Holbrook, Lake Havasu, Patagonia, Gila County, Graham County, Pinal County, Yuma County
Boy or Girl Scout troops	2	Chandler, Navajo County
Private companies	2	Fountain Hills, Prescott
<i>Special Collection Events</i>		
Christmas tree collection	9	Cottonwood, Florence, Goodyear, Kingman, Tombstone, Yuma, Apache County, La Paz County, Yuma County
Household hazardous waste	11	Carefree, Cottonwood, Holbrook, Mesa, Peoria, Scottsdale, Somerton, Tempe, Yuma, Apache County, Pima County
<i>Community Involvement Programs</i>		
Educational program	5	Cottonwood, Phoenix, Sedona, Willcox, Yuma
In-office recycling	4	Chandler, Mesa, Tucson, Pinal County
Multi-family recycling	1	Mesa
Partnerships	1	Sedona

Impediments and Disincentives to Recycling

The impediments and disincentives fall into four main categories, financial impediments, market alternative development, infrastructure and logistical problems and community education development. Financial concerns are, by far, the most frequently identified impediment to recycling. A complete list of the impediments and disincentives, as well as a list of the reporting jurisdictions, is provided in Table 11.

Financial Impediments

Financial impediments were identified by jurisdictions as the greatest impediment. This is consistent with the results from the past five years. The top financial concerns were the costs associated with starting and maintaining a recycling program, a lack of resources available for recycling programs and transportation costs. These are all legitimate issues that are difficult to overcome due to the current locations of recycling processors and end-users and the nature of the recyclable materials market. Other impediments listed included: little or no revenue generated from recycling, size of the jurisdiction, volume of material and the instability of the market prices.

Market Alternative Development

Many jurisdictions identified that marketing alternatives for recyclable materials needed to be developed. The impediment of finding a market for recyclables such as glass and plastics, has hindered the start of several recycling programs. Overall, the market for recyclables continues to fluctuate. It was also observed that the revenues gained, fluctuated with the market. The search for a higher gain for recyclable materials has increased since last year.

Infrastructure and Logistical Problems

Infrastructure and logistical problems were identified as major impediments to recycling. Other impediments noted by jurisdictions were: limited work force, minimal drop-off sites in the community, extended distances to the nearest material recovery facility and limited staff time and resources available to provide adequate recycling opportunities.

Community Education Development and Attitude

Several jurisdictions reported community education development and attitude as an impediment and disincentive to recycling. Other comments included that residents are not interested in recycling, not able to offer recycling due to a lack of funding and challenged with providing recycling education and opportunities to residents living in remote areas.

Table 11 lists impediments and disincentives to recycle in Arizona as identified by local jurisdictions within the state. The number of jurisdictions identifying each

impediment is given in the middle column. The jurisdictions identifying the impediment are given in the right column. Subcategories are given if several jurisdictions identify similar impediments or disincentive.

Table 11. Impediments and Disincentives to Recycle in Arizona as Identified by Local Jurisdictions Within the State		
Impediment or Disincentive	No.	Jurisdictions
<i>Financial Impediments</i>		
Cost of program/ lack of resources	22	Chandler, Cottonwood, Florence, Holbrook, Kearny, Lake Havasu, Marana, Mesa, Oro Valley, Patagonia, Show Low, Sierra Vista, Somerton, Tucson, Willcox, Apache County, Cochise County, Mohave County, Navajo County, Santa Cruz County, Yavapai County, Yuma County
Transportation costs	14	Douglas, Gila Bend, Holbrook, Lake Havasu, Mesa, Oro Valley, Patagonia, Prescott, Show Low, Sierra Vista, Springerville, Cochise County, Navajo County, Santa Cruz County
<i>Market Alternative Development</i>		
Prices/market fluctuations	7	Douglas, Flagstaff, Holbrook, Marana, Sierra Vista, La Paz County, Santa Cruz County
<i>Infrastructure/Logistical Problems</i>		
Lack of funding/support from city government	11	Holbrook, Oro Valley, Patagonia, Prescott, Show Low, Tucson, Apache County, Navajo County, Santa Cruz County, Yavapai County, Yuma County
Limited drop-off locations	9	Camp Verde, Gilbert, Gila Bend, Holbrook, Kingman, Lake Havasu, Marana, Mesa, Patagonia
No local processor nor curbside recycling	8	Goodyear, Kingman, Marana, Patagonia, Peoria, Winslow, Coconino County, Pima County

Table 11. Impediments and Disincentives to Recycle in Arizona as Identified by Local Jurisdictions Within the State

Impediment or Disincentive	No.	Jurisdictions
Control of collections by private company	6	Mesa, Prescott Valley, Apache County, Coconino County, Pima County
Other infrastructure and logistical problems	6	Payson, San Luis, Sedona, Sierra Vista, Apache County, Coconino County
Community size/ volume of materials	3	Cochise County, La Pa County, Santa Cruz County
Limited amounts of items accepted	3	Holbrook, Lake Havasu, Mesa
Contamination	1	Yuma
<i>Community Education Development</i>		
Community attitude/education	7	Chandler, Gila Bend, Marana, Oro Valley, San Luis, Pinal County
Lack of interest toward recycling	5	Bullhead City, Chandler, Mesa, San Luis, Pinal County

Recycled-Content Newsprint

A.R.S. §49-834 requires every consumer of newsprint in Arizona to insure that the newsprint they purchase during each fiscal year contains an average of at least 40 percent recycled content. Though it is not a requirement of the annual report, this section documents the efforts by the Recycling Program to verify that the consumers of newsprint in Arizona were in compliance with the statute for FY 2001. The report will break down the methodology used to acquire information from newsprint consumers and give the results gleaned from that information and compare the results to those from FY 2000.

Statute

The statute (A.R.S. §49-834) requires that every consumer of newsprint in the state insure that the newsprint they purchase each fiscal year contain an average of at least 40 percent recycled-content newsprint. However, certain conditions can be claimed by a consumer which prevented that consumer from satisfying the

minimum recycled content requirement. These conditions are:

- , Recycled-content newsprint was not available at a comparable price to that of newsprint made from virgin material. Comparable price is defined as within five percent of the price of virgin newsprint.
- , Recycled-content newsprint did not meet the reasonable quality requirements of the consumer.
- , Recycled-content newsprint was not available within a reasonable period of time.

Each consumer of newsprint is required to certify to the director of ADEQ the number of tons of newsprint and the number of tons of recycled-content newsprint purchased during the preceding year. In addition, each supplier of newsprint is required to certify the amounts of recycled-content newsprint in each shipment to each consumer in the state. To facilitate the collection of the information, the statute allows the director of ADEQ to develop and maintain a list of every consumer of newsprint in Arizona and every supplier of newsprint to those consumers. The reporting period is the state's fiscal year, July 1 through June 30, and the deadline for reporting is Sept. 30 of each year.

A.R.S. §49-831 defines "newsprint" as uncoated paper, whether supercalendered or machine finished, including the type generally used for the publication of newspapers, commercial advertising inserts, directories or commercial advertising mailers, which is made primarily from mechanical wood pulps. "Consumer of newsprint" is defined as a person who uses newsprint in a commercial printing operation or in a commercial publishing operation.

If a supplier of newsprint provides a consumer with misleading information concerning the recycled content of a shipment, or if a consumer supplies the director of ADEQ with misleading information concerning the recycled content of its purchases or misleading reasons why they did not meet the 40 percent requirement, ADEQ has within 30 days of this discovery to refer the misleading information to the attorney general for prosecution for fraud. Violations are subject to a civil penalty of no more than one thousand dollars.

Methodology

To complete the FY 2001 verification process, two forms were developed: one form for the web printers, and the other for the newspapers. Letters alerting each web printer and newspaper that the verification process was beginning were distributed on July 2, 2001. The forms were sent on July 12, 2001. Aug. 6, 2001 was set as the deadline for responses. Once the deadline had passed, phone calls were made to elicit responses. No magazines nor directories were contacted as all were either printed out of state or at known web printers during FY 2001.

Results

This section of the report will discuss the results of the recycled-content newsprint verification process. The section is broken down by the type of newsprint consumer: web printers, newspapers, directories, magazines and print shops. Under the conditions set for FY 2000, web printers are the primary consumers of newsprint, and recycled content results will be discussed for them only. Response rates and other ancillary information will be presented for the other consumers.

Web Printers

Web printers are, generally, the type of printer used by the newspaper industry. The term “web” has been coined as the presses are fed with rolls of newsprint and one continuous sheet of paper criss-crosses through the machine in a manner similar to a spider’s web. Web presses are capable of using any type of paper that is available on large rolls. However, they are very sensitive and can require extensive downtime for adjustments to change from one type of paper to another. Most magazines are printed using web presses and can be printed on coated groundwood paper or newsprint. Magazines containing high quality color photos require special web presses and glossy coated groundwood paper to reproduce the photos. These presses are reserved for this type of printing and will not run newsprint.

The newspaper industry used thirty different web printing facilities in Arizona during FY 2000. In addition, the Arizona Recycling Program staff found three web printers using glossy coated groundwood paper, and two web printers that began operations after the fiscal year ended. The last five printers mentioned were not considered consumers of newsprint for FY 2000 as defined by statute. Therefore, the population of printers that could be classified as newsprint consumers was 25. Several of the presses printed only one newspaper, while others were responsible for up to 26 and may have also been used to print advertisement inserts, directories and magazines (information begins on Page 151).

Of the 30 printers contacted to complete the recycled-content newsprint verification form, 29 were printed on web presses and one was printed on a sheet fed press such as those used by small print shops. Three of these printers no longer had operations in Arizona. All 27 of the active printers, a 100 percent response rate, submitted their completed forms by Sept. 4, 2001.

The average recycled content of the newsprint consumed during FY 2001 was 67 percent. This represents a 12 percent increase over the 55 percent reported for FY 2000. As in FY 2000, three web printers did not reach the 40 percent requirement. Arizona Web Printing had an average recycled content of 25.34

percent. This was an increase from the 19.76 percent they reported in FY 2000. The printer claimed exemption two, "Recycled fiber content did not meet the reasonable quality requirements of the press operator of newsprint." Territorial Newspapers reported an 8.06 percent recycled content. During FY 2000 they reported a recycled content of 3 percent. This printer also claimed exemption two, stating their largest client requires that they use an upgraded paper. Casa Grande Valley Newspapers, which met the requirement last year, reported a recycled content of 38.20 percent. It also claimed exemption two, stating that down time at Abitibi Consolidated prevented the printer from purchasing enough 100 percent recycled-content newsprint. They do not run a web printer, but one that is sheet fed. On the positive side, Liberty Globe Publishing increased its recycled content from 25.5 percent to 100 percent. Three other web printers, Fidelity Press West, The Daily Dispatch (Douglas) and Worldwest LLC also reported using 100 percent recycled-content paper.

Figure 5 shows graphically the number of printers averaging various ranges of recycled content for both FY 2000 and FY 2001. Two peaks occur on the bar chart for each year. The first is composed of those printers averaging between 40 percent and 50 percent recycled content and those averaging between 50 percent and 60 percent recycled content. These are predominantly large printers that use several suppliers to maintain a reliable supply of newsprint and that also print various types of publications. Their newsprint is comprised of various types with various recycled contents.

The second peak is composed of those printers averaging between 80 percent and 90 percent recycled content and 90 percent and 100 percent recycled content. These are smaller printers that rely largely on newsprint from Abitibi Consolidated. This mill produces a 100 percent recycled-content sheet. The chart also shows a definite shift to higher recycled content from the first year to the second. The larger printers have increased their recycled content by approximately 10 percent. This trend is the cause of the 12 percent overall jump in recycled content as the large printers dominate that statistic. The smaller printers have shifted also. The number of small web presses using more than 90 percent recycled content jumped from five to nine, while those in the 80 to 90 percent range increased from three to five. If the statute had not been changed and the requirement had become 50 percent in FY 2000, only five of the 27 printers would have been out of compliance in FY 2001, as compared to nine of the 24 printers in FY 2000.

As a group, the presses consumed 202,674 metric tons of newsprint, a 1.25 percent decrease in total consumption compared to the 205,234 metric tons consumed the previous year. Figure 6 illustrates the amount of newsprint consumed by each of the major web printers, *The Arizona Republic*, *Tucson Newspapers* and *The Tribune*, which account for over 80 percent of the newsprint

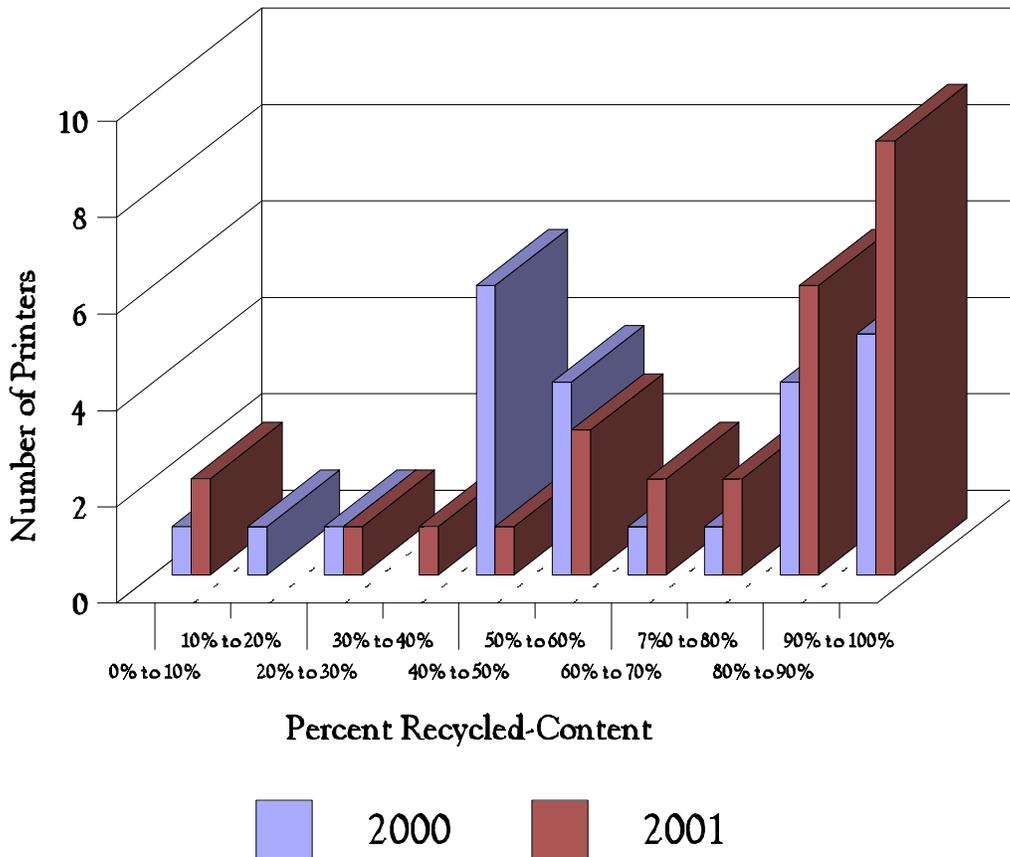


Figure 5. The average recycled-content of Arizona printers. The most common averages are between 40 percent and 60 percent and between 80 percent and 100 percent. The first peak represents large printers who use several suppliers to maintain a reliable supply of newsprint and that also print various types of publications. The second peak represents smaller printers that rely largely on newsprint from Abitibi Consolidated. In addition, there is a clear shift toward higher recycled-contents from FY 2000 to FY 2001.

consumed. In contrast to the decrease in total consumption mentioned above, the amount of recycled-content newsprint rose from 113,137 metric tons during FY 2000 to 135,830 metric tons during FY 2001. This increase of over 22,600 metric tons represents a 20.1 percent jump. Table 14, which begins on Page 151, lists each web printer along with the amount of newsprint each consumed and the average percent of recycled content each used.

Of the 303 newspapers contacted, 181 completed the form, a 60 percent response rate. This is lower than the 89 percent response rate during FY 2000. However, no call backs were made to the newspapers, as no new web printers were reported to begin operations during FY 2001, and all of the newsprint consumed in Arizona could be accounted for through the printers.

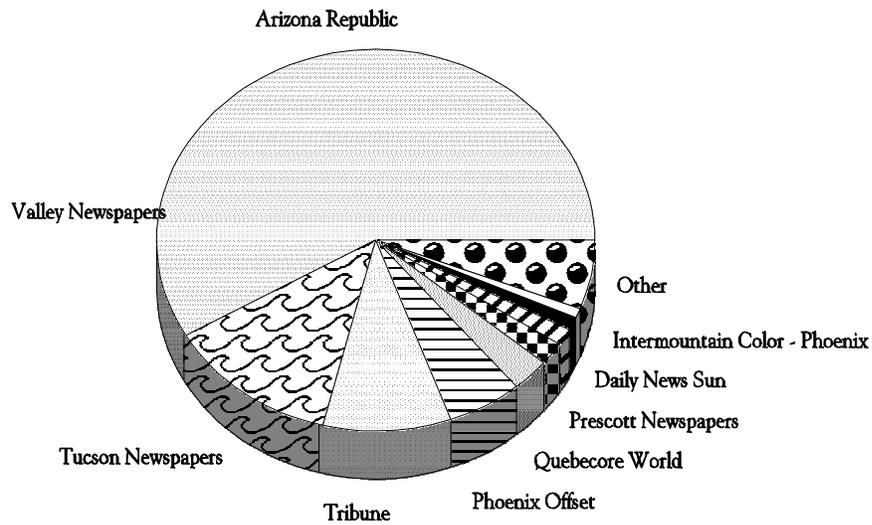


Figure 6. The relative amounts of newsprint consumed by the largest printers in Arizona. The Arizona Republic, Tucson Newspapers and the Tribune combine account for over 80 percent of the newsprint used for the publication needs of all newspapers, directories and magazines in Arizona.