Chapter 8
NEED FOR ADDITIONAL CAPACITY

NOTE: It is important to note that the needs analysis shown in this chapter has been superseded by the capacity allocation process currently being conducted by the Hazardous Waste Management Capacity Allocation Committee of the Association of Bay Area Governments as part of the effort to develop an interjurisdictional agreement among the nine Bay Area counties for siting new hazardous waste facilities.

CAPACITY ALLOCATION PROCESS/STATUS OF INTERJURISDICTIONAL AGREEMENTS

The Bay Area Regional Hazardous Waste Management Capacity Allocation Committee (CAC) was created to develop a regional approach for providing hazardous waste management facility capacity in the Bay Area. Providing for capacity is required by State law for individual jurisdictions (counties) unless interjurisdictional agreements are in place. As part of the regional effort, the member counties of the CAC have entered into a hazardous waste interjurisdictional agreement. The Hazardous Waste Management Planning Interjurisdictional Agreement is included in Appendix J of this document. As an essential part of the interjurisdictional agreement, the CAC has developed a Capacity Allocation Plan for providing the capacity necessary to manage hazardous waste in the region.

The Capacity Allocation Plan is based on a "Fair Share" method for allocating responsibility within the jurisdictional boundaries of the member counties. In order to implement the Capacity Allocation Plan, the Committee has collected the latest available data on generation of off-site managed hazardous wastes and hazardous waste management capacity within the nine-county Bay Area region. The data used in the Capacity Allocation Plan supersede the 1986 generation data shown in the Alameda County Hazardous Waste Management Plan.

The CAC estimated the need for future offsite hazardous waste management facilities using a model developed by the Association of Bay Area Governments to project hazardous waste generation based on projected economic growth of generators. The projections also assume a 25 percent reduction in hazardous waste generated due to aggressive waste minimization and source reduction programs considered to be the highest priority in the interjurisdictional agreement. The region's offsite hazardous waste management capacity is projected to be approximately 300,000 tons annually in the year 2000. This projection includes existing facilities only. The region's projected capacity requirement is about 495,000 tons per year in 2000. Therefore, the nine-county region will have an overall capacity deficit of about 195,000 tons in 2000 assuming existing capacity remains and no new capacity is added.

The Capacity Allocation Plan distributes the responsibility for filling the regional capacity deficit gap among the participating counties based upon their contribution to the deficit. Those counties

contributing to the capacity deficit are assigned responsibility for specific treatment method groupings depending on the size of the deficit contribution. Treatment methods have been ranked by desirability and less desirable methods (those lowest on the waste management hierarchy) have been assigned to the counties with the greatest deficit contributions. Each member county is being requested to provide siting opportunities, consistent with its own County Hazardous Waste Management Plan, for treatment or disposal capacity. The outcome of this process allocates responsibility in the following manner:

Santa Clara County	Residuals Repository Capacity
Contra Costa County	Incineration Capacity
Sonoma County	Stabilization Capacity
Solano County	Aqueous Metals Treatment Capacity
Alameda County	**Other Recycling Capacity**
Napa County	Other Recycling Capacity
Marin County	Other Recycling Capacity
San Mateo and San Francisco Counties[1]	No Allocation

For more details on the Capacity Allocation Process and the interjurisdictional agreements contact the Association of Bay Area Governments for a copy of Staff Report, prepared for the San Francisco Bay Area Hazardous Waste Management Capacity Allocation Committee, August 28, 1991.

A. BASIC HAZARDOUS WASTE MANAGEMENT OPTIONS AND ECONOMIES OF SCALE

Alameda County's many hazardous waste generators, even with aggressive source reduction, will generate a large volume of hazardous wastes well into the 21st century. Estimates range from a low of 88,200 tons/year to a high of 138,600 tons/year. These wastes require effective management, either onsite or offsite, in a range of appropriate facilities:

- Transfer
- Storage
- Recycling
- Aqueous treatment (including physical, chemical and biological treatment)
- Incineration, except as otherwise prohibited

[1] San Mateo and San Francisco Counties have met their fair share responsibility pursuant to the criteria set forth by the CAC and described in detail in the Staff Report.

- Solidification or stabilization
- Mobile treatment
- Residual repositories (for land disposal of treatment residues)

Moderate and aggressive (and strict) source reduction estimates already include significant onsite and offsite recycling capacity.

BASIC HAZARDOUS WASTE MANAGEMENT TECHNOLOGIES

Basic information on the typical characteristics and sizes of hazardous waste management technologies or facilities is provided in Appendix F. This information will assist in understanding the environmental implications of each type of facility found to be needed in Alameda County.

B. ALTERNATIVE PROJECTIONS OF ALAMEDA COUNTY WASTES APPROPRIATE FOR TREATMENT ONSITE OR OFFSITE

Some of these treatment capacity needs could be shifted away from commercial offsite capacity needs if, after maximum waste minimization is achieved, onsite treatment was employed. To predict the reduction in commercial capacity need achievable by onsite actions is difficult, unfortunately, because of the many factors which affect a generator's ability to participate in onsite treatment. Any degree of onsite treatment will reduce offsite needs. More widespread use of onsite treatment will reduce offsite treatment needs to a greater extent.

There are several barriers to implementing a widespread onsite treatment program. First, some onsite treatment technologies may be quite costly. In Alameda County, approximately 66 percent of all businesses included in the No Survey Method had fewer than 10 employees; 90 percent had fewer than 50 employees. Small businesses, such as the majority of Alameda County's predicted (and manifested) hazardous waste generators, cannot easily afford the investments required to install equipment for onsite treatment. Usually these small businesses have very slim profit margins. The No Survey Method (NSM) estimated a total of approximately 7,000 small generators. DEH estimates that they have identified 3,000 generators. A phone survey of a sample of the 7,000 small quantity generators identified was conducted in February 1988. Approximately 65 percent of the firms participating in this survey stated that they do not generate hazardous wastes. This finding may explain the discrepancy between the NSM estimate and the DEH estimate. After the generators have been identified, education and funding plans must be developed to help these firms participate in any onsite effort. Also, appropriate technologies to handle small amounts of waste must be developed and made easily available. Thus, there are significant barriers associated with widespread participation in an onsite treatment program.

It is likely that the large quantity generators in the county, which tend to be large, profitable businesses (see Chapter 3), could increase significantly the amount of onsite treatment they use.

While it is thought that a large amount of onsite treatment is currently in place with large generators, it is probable that many local businesses have not yet installed waste treatment technologies. This is encouraging because these large generators contribute a significant amount to the Alameda County hazardous waste stream; are easily identified (they are probably manifestors); and there is a strong possibility that they could fund installation of onsite treatment equipment. Also, technologies to reduce large quantities of waste do exist and are readily available. Alameda County could, with reasonable probability of success, reduce its offsite treatment needs significantly by encouraging large generators to utilize onsite treatment technologies for wastes remaining after aggressive source reduction.

Alameda County's needs for offsite hazardous waste treatment capacity may be differentiated in several different ways:

- By type of waste
- By type of industry generating the waste
- By location of generating industries
- By type of facility
  - Recycling
  - Treatment
  - Transfer
  - Storage
  - Incineration, except as otherwise prohibited
  - Residuals repository

Several different types of treatment can be used to make hazardous wastes as safe as possible before final disposal. Alameda County's needs for these various types of treatment can best be estimated based on the County's projected hazardous waste stream for 2000.

Precipitation, neutralization, carbon adsorption, and solvent recovery/distillation are the four primary treatment methods for hazardous wastes. Secondary treatments include incineration and stabilization. After wastes have been fully treated, any hazardous residuals must then be deposited in a repository. Figure 8-1 shows this sequence of actions.

The 18 waste categories defined in the DHS Technical Reference Manual can be regrouped into five waste groups based on treatment requirements. These groups are waste metal solutions, high or low pH solutions, aqueous organic solutions, spent solvents or waste oils, and solid or liquid waste organics.

Table 8-1 summarizes waste reduction efficiencies of each basic treatment method. A particular hazardous waste can be reduced only as much as its required treatment sequence will allow. For example, waste metal solutions use precipitation as the primary treatment method. Here

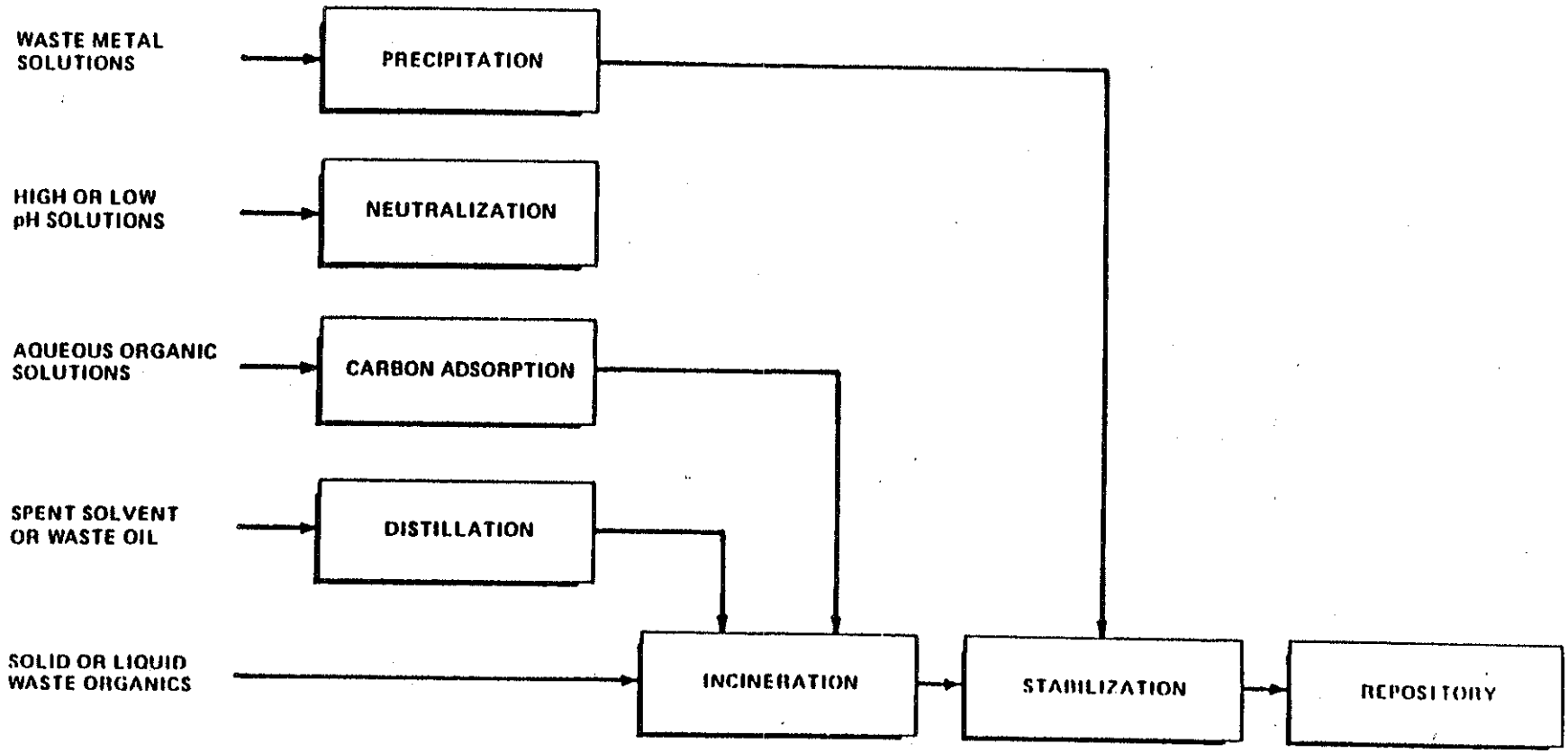

Figure 8-1

WASTE TREATMENT SEQUENCES

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Table 8-1 Generic Treatment Efficiencies	
Generic Treatment	**Percent Reduction by Weight**
Oil Recovery	70-80%
Solvent Recovery/Distillation	70-75%
Carbon Adsorption	80-90%
Incineration	85-90%
Precipitation	50-90%
Neutralization (Non-Metal)	85-100%
Stabilization	Adds 20-40%

they are reduced, in the maximum case, by 90 percent. Precipitation residuals are then stabilized, which increases their weight a minimum of 20 percent. The net reduction potential for waste metal solutions is 88 percent. For high or low pH solutions 100 percent reduction is possible. The potential for aqueous organic solutions is 98.8 percent. Spent solvents can be reduced by as much as 97 percent, waste oils by 97.6 percent. Solid or liquid waste organics have a reduction potential of 88 percent. With proper treatment, only 2.4 to 12 percent of hazardous wastes generated actually require ultimate disposal in a repository.

Figure 8-2 summarizes the different waste treatment capacity requirements in 2000 were no source reduction to be practiced (Baseline projection).

Table 8-2 shows the various treatment capacity needs for this economically-driven baseline generation projection, year 2000, without source reduction. (NOTE: This ignores possible use of onsite treatment systems and transportable treatment units.) Baseline facility capacity needs are summarized in Table 8-3.

These requirements can be reduced, as discussed above, with moderate, aggressive, or strict source reduction efforts and maximum treatment reduction efficiencies. (Average values for efficiency were used in this table.)

Manufacturing represents the highest capacity need in all categories of treatment type, except out-of-state incineration for dioxins and PCBs. Services shows the next greatest demand for distillation, carbon adsorption, precipitation, incineration, stabilization, and repository disposal. Waste reduction would reduce these treatment, incineration, and disposal capacity requirements--the more reduction in wastes, the more reduction in capacity needs.

Table 8-4 illustrates the treatment capacities needed in Alameda County for 2000 waste generation projections at each of the projected levels of onsite source reduction. Moderate source reduction reduces capaciy needs by 10 to 20 percent. Aggressive source reducion reduces capacity needs by 25 to 50 percent. And strict source reduction gives an across-the-board reduction of 38.7 percent.

As expected from the county waste stream profile, the greatest need is for oil and solvent recovery. With no increased source reduction efforts, full recovery would yield 1,421 tons (2.4 percent of baseline generation) of waste oil residuals and 464 tons (3 percent of baseline generation) of solvent residuals requiring disposal. In contrast, an aggressive source reduction effort combined with full recovery would yield 1,066 tons (1.8 percent of baseline generation) of waste oil residuals and 232 tons (1.5 percent of baseline generation) of solvent residuals. The combined effect of maximum source reduction and full treatment yields the greatest possible reduction in hazardous wastes requiring ultimate disposal.

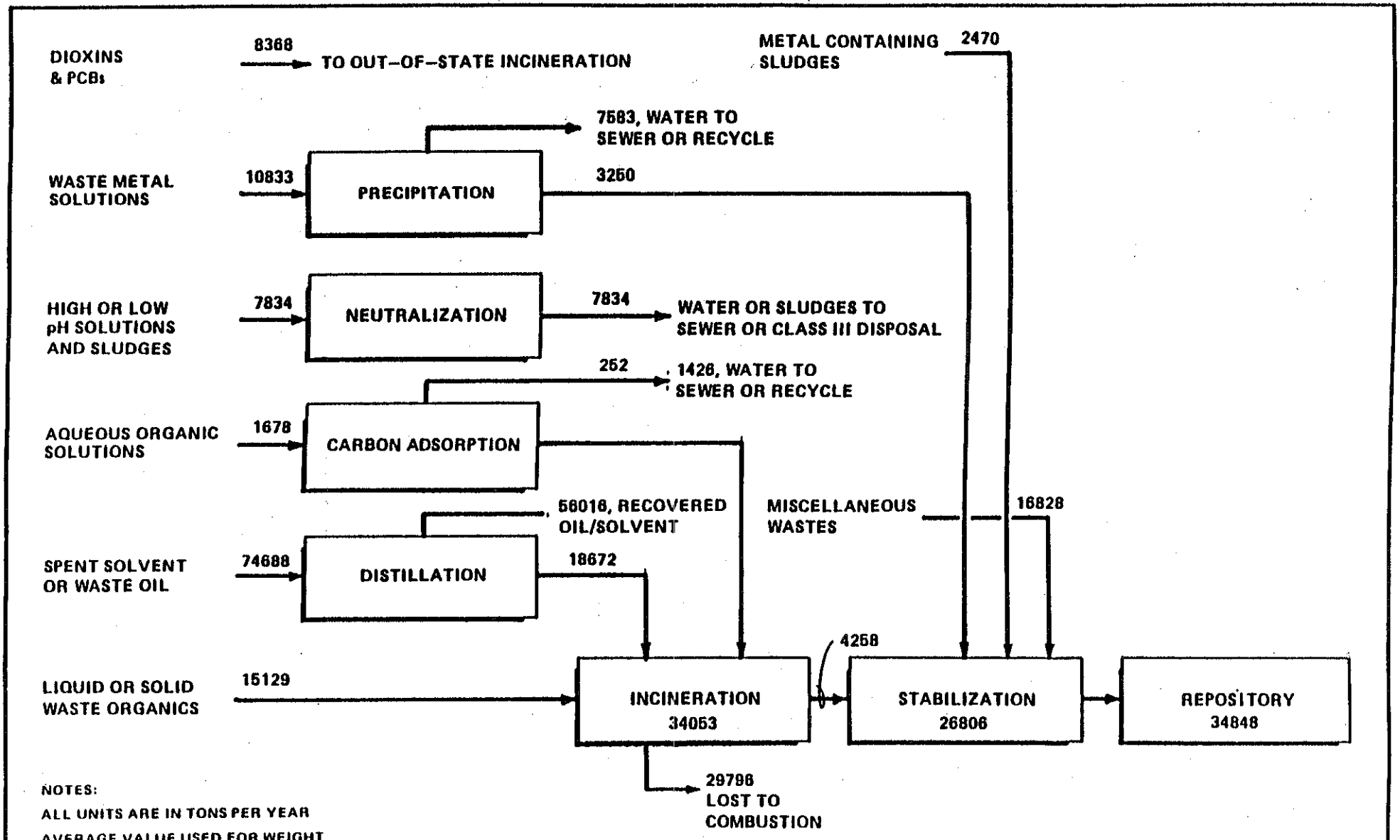

Figure 8-2
WASTE TREATMENT SEQUENCES
YEAR 2000
BASELINE CAPACITIES

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Table 8-2
Alameda County[b,c]

Business Sector	Oil/Solvent Distillation	Carbon Adsorption[a]	Precipitation	Neutralization	Incineration	Stabilization[d,e]	Repository	Out-of-State Dioxin & PCB Incineration
Agriculture	2				77	51	66	
Construction	1,835	6		27	1,204	642	835	
Manufacturing	34,913	1,204	8,101	6,505	18,760	11,516	14,971	526
Transportation, Communication and Utilities	6,809	101	135	637	2,877	1,780	2,314	3,996
Wholesale Trade	866		25	58	329	304	395	2,968
Retail Trade	8,498		1	96	2,306	2,571	3,342	
Finance, Insurance and Real Estate	39	48		22	26	7	9	61
Services	19,993	187	2,283	393	7,055	6,736	8,757	523
Government	907	130	141	811	917	995	1,294	308
Unclassified	826	2	147	93	502	293	391	16
Total	**74,688**	**1,678**	**10,833**	**8,642**	**34,053**	**26,806[f]**	**34,848[f]**	**8,398**

[a]Some of the organic wastes that can be treated via carbon adsorption could not be specifically identified in the No Survey Method; this column represents manifested waste only.
[b]This table does not include capacity for contaminated soils from a variety of sources. Also, the focus on onsite treatment is intensifying.
[c]Average values for weight reduction were used in calculating capacity requirements for processes.
[d]Miscellaneous wastes, e.g., batteries, lab packs, and metal dust are assumed to be stabilized without pretreatment.
[e]Includes household hazardous wastes.
[f]Totals recognize that stabilization reduces toxicity, but adds mass.

Table 8-3
Baseline Waste Stream-2000
Alameda County

Business Sector Growth (%)	SIC Codes	TPY, 1986[a]	TPY,[b,c] 2000	Business Sector Growth %
Agriculture	700-800	100	119	-1.22
Construction	1500-1700	1,751	3,102	4.17
Manufacturing	2000-2700	45,595	67,844	2.72
Transportation	4000-4900	10,292	14,189	2.32
Wholesale Trade	5000-5100	2,672	4,285	3.43
Retail Trade	5200-5700	7,688	11,058	2.63
Finance, Ins. and Real Estate	6100-7000	111	182	3.61
Services	7100-8900	14,623	30,577	5.41
Public Administration	9100-9700	3,219	3,804	1.2
Nonclassifiable	9900		4,376	0.0

[a]Percent growth compounded annually, 1986-2000; TPY = tons per year
[b]Derived from ABAG projection data--Developed by Ray Brady
[c]Includes manifested, SQG, and household waste projections precipitation and stabilization capacities. Requirements for final disposal at a repository are greatest in the manufacturing and services sectors, where most wastes are oils and solvents which yield only 70 to 80 percent reduction with distillation.

Table 8-4
Needs Assessment Capacity Requirements
With Different Waste Reduction Scenarios
Year 2000
Alameda County

Tons Per Year

	Baseline[a]	Moderate	% Baseline	Aggressive	% Baseline	Strict[d]
Oil Distillation[c]	59,212	53,291	90%	44,409	75%	36,292
Solvent Distillation[c]	15,476	12,381	80%	7,739	50%	7,700[e]
Carbon Absorption	1,678	1,510	90%	1,259	75%	1,028
Precipitation	10,833	9,208	85%	6,500	60%	6,500[e]
Neutralization	8,642	7,778	90%	6,482	75%	5,297
Incineration	34,053	30,261	89%	24,573	72%	20,871
Stabilization	26,806	23,627	88%	18,828	70%	16,430
Repository	34,848	30,715	88%	24,476	70%	21,359
Out-Of-State Incineration[b]	8,398	8,398	100%	8,398	100%	8,398

[a]No source reduction
[b]Out-of-state incineration is not affected by source reduction since PCB discovery and abatement is an ongoing program based on past practices.
[c]These categories were separated from each other since their reduction potentials are different.
[d]Detailed calculations were not possible for each waste treatment category. Instead, the same proportional reduction (some 38.7 percent) was applied to each Baseline category once the out-of-state incinceration total was eliminated from both groups.
[e]Assumes lower aggressive total.

C. POTENTIAL EXPANSION OF EXISTING KEY FACILITIES

AB 2948 requires that each county's hazardous wase management plan include an analysis of the probable extent to which that county's future waste stream can be managed in existing treatment, storage, and disposal facilities (TSDFs). As documented in Chapter 3, four facilities received a large proportion of Alameda County's manifested wastes in 1986; Casmalia, Kettleman Hills, Panoche, and Vine Hill/Baker. Current operations at these facilities and potential future expansion are described in Appendix G.

D. IMPLICATIONS FOR HAZARDOUS WASTE MANAGEMENT CAPACITY IN ALAMEDA COUNTY

On the assumption that the need for new facilities results from strict source reduction shown in Table 8-4, not requiring further onsite treatment, and that facilities are developed along the size projections set forth earlier in this chapter, Alameda County's apparent offsite facility requirements are summarized in Table 8-5. These estimates incorporate adequate flexibility to meet actual siting requirements. Numbers are rounded to the nearest 100 tons.

One large oil recycling plant[2] appears warranted; this capacity might be met by expansion of one or more of the three facilities already operating here, or by siting of a new facility. The aggressive source reduction estimates from Jacobs Engineering's report include a component for offsite recycling, which requires siting.

Some additional capacity for solvent distillation and recycling appears to be needed. Alternatively, this need might be met by expanded use of the Romic facility in San Mateo County if sufficient capacity exists there. Romic has applied to the City of Newark to site a rail transfer facility capable of handling 23,000 tons of waste annually. Plans are to transport waste from the East Palo Alto facility to the Newark facility via the Dumbarton Bridge. Waste would be loaded on outbound rail cars at the Newark facility. The Newark facility would handle Alameda County and other county wastes thus serving as a regional facility.

The County's needs for aqueous waste treatment are much smaller than the typical economic and technical facility scale needed. Use of mobile treatment technologies would seem appropriate--or export to fixed treatment facilities located in other counties.

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[2] Evergreen Oil Inc., began operating its oil recycling facility in Newark in 1986. The state of the art recycling process used at this facility produces no hazardous waste byproducts. In 1987, Evergreen recycled approximately 21,000 tons of waste oil. Evergreen estimates that it collected about 2,630 tons of waste oil from within Alameda County with the remaining 18,370 tons coming from other counties. The facility has enough capacity to handle between 35,000 and 42,000 tons of waste oil each year. This facility substantially increases the County's existing waste oil recycling capacity and also serves as a regional facility for other counties.

Table 8-5
Alameda County
Potential Offsite Facility Development Requirements
(tons*)

Technology	Waste Requiring Treatment[a]	Typical Facility Scale[b]	Number and Scale of Potential Facilities Required[c]
Oil Distillation	36,300	40,000	1 Large
Incineration**	20,900	30,000	1 Small[d]
Stabilization	16,400	50,000 (varies)	(Designed to scale)
Solvent Distillation	7,700	10,000	1 Small
Carbon Adsorption	1,000		
Precipitation	6,500	70,000	Mobile Systems
Neutralization	5,300		
Repository	21,400[e]	75,000	0[f]
Transfer Facilities	Large volumes from small generators	10,000	2 or 3

[a]Estimated; assumes a comprehensive waste management program with aggressive source reduction by existing generators and strict requirements for all new facilities.
[b]Based on typical economies of scale for private-sector hazardous waste managment facilities. Installation of new facilities in 1987-1989 will reduce requirements for new facilities.
[c]Assumes basic comparability between capacity requirements and facility scale.
[d]Assumes limit import of incineratable wastes to meet minimum facility size capacity.
[e]Annual capacity requirement.
[f]Assumes export of wastes; repository siting not ruled out, but would require significant imports of wastes to meet minimum facility capacity.
*Rounded to the nearest 100 tons.
**See Policy 2B.

The data indicate that the need for rotary kiln incineration seems close to the smaller scale of a modern facility (about 70 percent). It seems that Alameda County should include such a facility in its Plan. Formal permitting proposals for new incinerators are already underway in the Martinez area by Stauffer Chemical Co.; in southern California, the Vernon proposal; and in Kings County at the Kettleman Hills facility. Moreover, some liquid incineratable wastes could go to the cement kiln incinerator in Lebec, Kern County. New incineration capacity is now under construction in Arizona. Nevertheless, the presence of over 20,000 tons per year of incineratable wastes from Alameda County generators even after strict source reduction (and over 34,000 tons in the baseline alternative) requires careful attention in this planning process. It seems unrealitic to assume much onsite incineration of these wastes, and unreasonable to assume that they can all be sent entirely out-of-county forever.

A residuals repository in Alameda County does not seem warranted by these data. The smallest commercial-scale facility is estimated at some 75,000 tons/year of use. This is approximately three-and-a-half times larger than the wastes requiring disposal in the strict source reduction alternative, and more than twice the size even of the baseline waste stream estimate with no source reduction. These wastes presumably would have to be exported to a facility sited in another county, such as the Kettleman Hills facility in Kings County, or the Casmalia facility in Santa Barbara County. These exports would have to be included in an intercounty agreement. Alternatively, the local treatment residues requiring disposal could be placed in a repository located in Alameda County. This facility would either have to be subsidized by local governments (given its small scale), or important large volumes of waste residues from other counties.

Small transfer stations appear to be needed in North County and South County as well as in the Livermore Valley to responsibly meet the needs of the hundreds of small waste generators located in these areas.

The County's priority siting requirements under these assumptions are for:

- Two or three transfer stations
- A small incinerator, except as otherwise prohibited
- A small solvents recovery facility
- Expanded waste oil recycling capacity (need will be diminished based on planned new facilities)
- A designed stabilization unit

The information on which these assumptions are based are uncertain. The estimates of existing and projected waste generation are uncertain. Most development and siting proposals will be prepared by private developers using their own estimates of regional--or even statewide and national--markets. A portion of the identified facility needs may be addressed through intercounty

agreements. For example, importation of some hazardous wastes for treatment in facilities, such as oil recycling or an incinerator, designed and sized primarily to meet local needs in Alameda County might counterbalance exports of residuals to an economically-sized repository unit located elsewhere. In this event the facility's scale would have to be adjusted upward accordingly.