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PRELIMINARY FEASIBILITY ELSMERE CANYON LANDFILL NEAR NEWHALL, CALIFORNIA

FINAL DRAFT

MAY, 1984

Prepared by
Cooper Engineers
10961 Sun Center Drive, Suite 100
Rancho Cordova, CA 95670
(916) 635-9140

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TABLE OF CONTENTS

TABLE OF CONTENTS
(continued)

APPENDICES

LIST OF FIGURES

LIST OF TABLES

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

Landfill & Ecology Corps requested that Cooper Engineers conduct an assessment to determine the preliminary feasibility of developing a sanitary landfill in the Elsmere Canyon area located southeast of the Interstate 5, Interstate 210, and State Route 14 Freeway Interchange Complex near Newhall, California (See Figure A). The preliminary feasibility assessment was completed to the extent that a firm decision can be made to commit to additional engineering, environmental, and implementation efforts needed to permit the site and start operations. The preliminary feasibility investigation focussed on evaluating major environmental constraints, reviewing geotechnical, geological, and hydrogeological factors of the site, reviewing the need and availability of waste for the site, preparing preliminary development alternatives, and conducting a preliminary economic assessment.

Elsmere Canyon and its southerly tributaries provide good topography for a canyon landfill. There is a divide, separating the site into a northern and southern section. The feasibility investigation focussed on development of the northern and central areas first, primarily on properties owned by Barbara Letourneur and Chevron, USA. Three development options were investigated:

- Alternative 1 - Full utilization of the central and part of the northern section of the property (950 acres); capacity of 140 million tons; re-route the LA Department of Water and Power power transmission lines (SHEET 1).

- Alternative 2 - Develop the same general area as Alternative 1 (950 acres); capacity of 60 million tons; however, keep the power lines in their current location and fill around them (SHEET 2).

- Alternative 3 - Utilization of the Latourneur parcel only (160 acres); capacity of 9,000,000 tons; keep power lines in their current locations (SHEET 3).

The site appears well suited for development into a municipal solid waste (MSW) disposal facility meeting the requirements of a Class III disposal site. This new classification has recently been adopted State Water Resources Control Board and is equivalent to the old Class II-2 classification. No liquid or hazardous wastes would be accepted. Our assessment includes the following findings, conclusions and recommendations:

- The site appears suitable for development into a municipal solid waste disposal site (no liquid or hazardous wastes; only refuse and inert wastes).

- There will be a shortfall of 6,000 tons/day of landfill capacity due to landfill closure by the beginning of the 1990's. The City of Los Angeles Toyan landfill is expected to close by 1985 (2,000+ tons/day) with no alternative available in the near future. A large portion of this shortfall is in the Los Angeles and San Fernando Valley area. Some of this shortfall is expected to be absorbed by waste-to-energy facilities.

- The potential waste supply must be attracted to this facility through market agreements and a competitive price.

- The nearby Sunshine Canyon Landfill would be a direct competitor for this waste stream. However, its long-term capacity to accept these wastes are dependent on getting approvals for expansion from the City and County of Los Angeles. There has been significant citizen opposition to this expansion. Disposal fees at Sunshine appear to be higher than the proposed fees at Elsmere Canyon.

- Based on a waste supply of 2,000 tons/day, the site could be operated at a tipping fee of about $3.90/ton during its first year of operation assuming the use of all new equipment. These fees could be reduced by about $0.30 ton if used equipment is purchased.

- The facility would have an ultimate life of over 200 years, if utility lines are moved, assuming a 2000 ton/day waste input (Alternative 1). The life would be about one half of that (100 years) without the movement of utility lines (Alternative 2). The site would have 12 years of life using only the center parcel (Alternative 3).

- There appears to be no geotechnical, geological, or hydrogeological factors mitigating the suitability of the site. The pertinent geotechnical findings are as follows:

  - Sufficient cover material can be generated on site through excavation and ripping.
  - The underlying groundwater is insignificant in quantity, likely is contaminated by naturally occurring deposits of tar and oil, and would have little beneficial use. Based upon known information the site should not pose a threat to contamination of usable groundwater.
  - Natural slope stability appears to be relatively good, except for the dip-slope area south of Fremont Peak. This area is not considered for development at this time.
  - There are no known active faults within the property which would preclude development of the site as a disposal site for MSW.

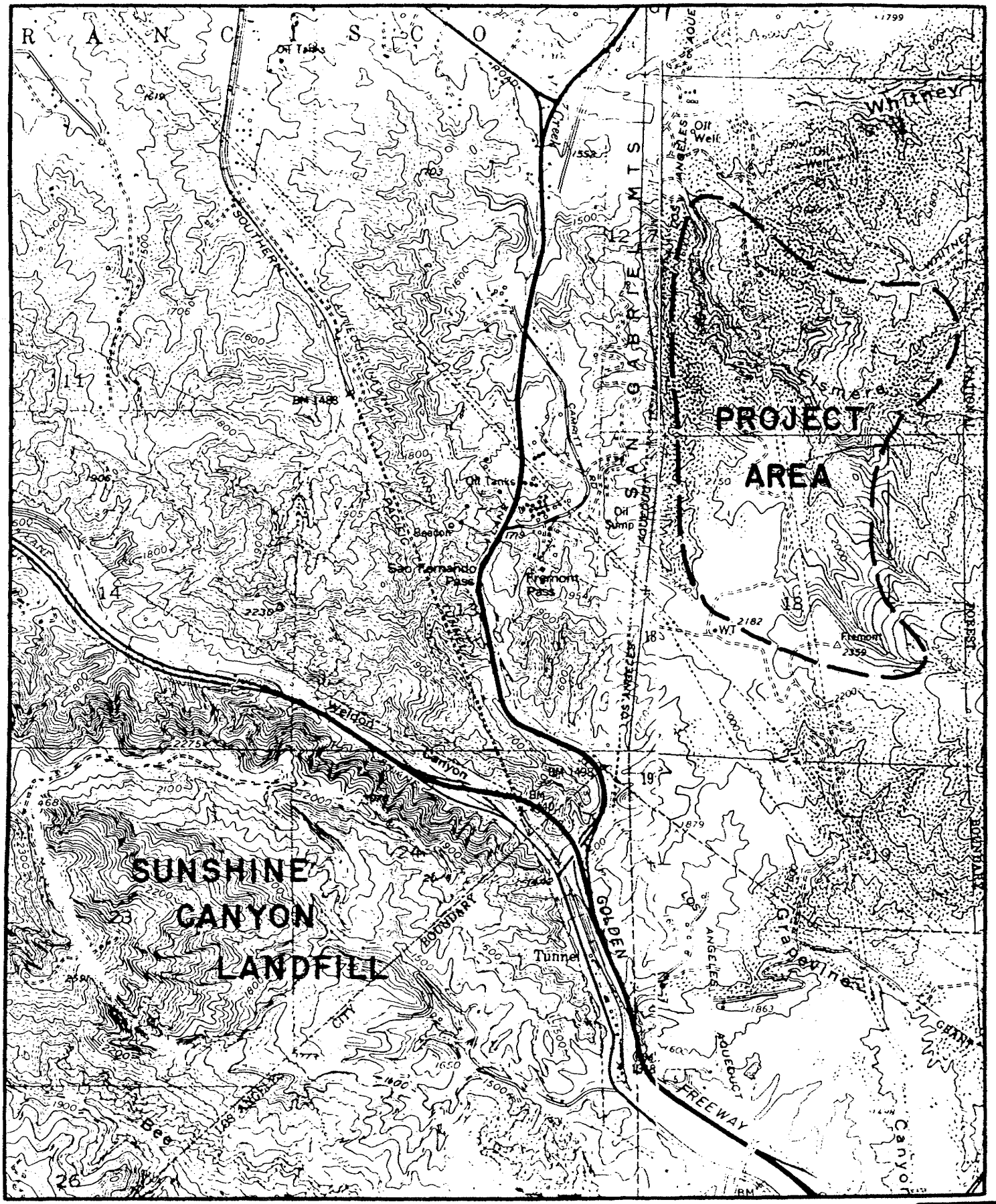
- Further investigation is necessary to determine if sufficient low-permeability material is on-site for final cover and liner purposes. However, the climate and groundwater conditions are such that other design methods should be available to preclude the need for low permeability materials.

- A capital investment of about $200,000 is needed to support permit procurement activities (engineering, EIR, etc.). About $3 to 4 million of capital would be needed for site improvements, property acquisition, and equipment for each of the three alternatives. An undetermined amount would be needed eventually to relocate utility lines for Alternative 1.

- A preliminary environmental investigation concluded that there appear to be no unmitigatable environmental impacts.

- The permitting and environmental assessment process should begin as soon as possible. Based on the history of other similar projects, a time frame of 1-2 years or longer to complete this process may not be unreasonable.

FIGURE A



PROPOSED ELSMERE CANYON LANDFILL
VICINITY MAP

Cooper Engineers

PRELIMINARY FEASIBILITY
ELSMERE CANYON LANDFILL
NEAR NEWHALL, CALIFORNIA

PRELIMINARY FEASIBILITY
ELSMERE CANYON LANDFILL
NEAR NEWHALL, CALIFORNIA

INTRODUCTION

Landfill and Ecology Corps is pursuing the development of a sanitary landfill in the Elsmere Canyon area located southeast of the Interstate 5, Interstate 210, and State Route 14 Freeway Interchange Complex near Newhall, California. The location and vicinity maps of the proposed disposal site are shown on Figure 1 and 2.

Cooper Engineers, Inc. has been retained by Landfill & Ecology Corps to prepare a preliminary feasibility assessment for development of a landfill at this site to accept municipal solid waste (MSW) and meet the requirements of a Class III disposal site (recently adopted State Water Quality Control Board classification equivalent to the old Class II-2 classification).

This study was performed pursuant to our proposal to Landfill & Ecology Corps dated May 6, 1983. A preliminary reconnaissance of the property was made by representatives of Cooper Engineers and Landfill & Ecology Corps on June 25, 1982. At that time it was determined that the site looked promising for development into a solid waste facility. However, further investigation of key items was desirable to confirm the preliminary feasibility. Therefore Landfill & Ecology requested Cooper Engineers to conduct the study outlined in our proposal. Tasks under this study focused on determination of the following key items:

1. Identify the regulatory and institutional constraints.
2. Prepare a preliminary geotechnical/geological analysis of the site (review and analysis of existing data and a limited field investigation).
3. Assess surface hydrology characteristics of the site.
4. Assess site characteristics and constraints.
5. Identify major environmental considerations.
6. Review proposed landfill operational aspects.
7. Prepare a preliminary cost estimate for development of the site.
8. Prepare a report on the preliminary feasibility assessment for development of a land disposal site.

PROPOSED ELSMERE CANYON LANDFILL
LOCATION MAP

FIGURE 1

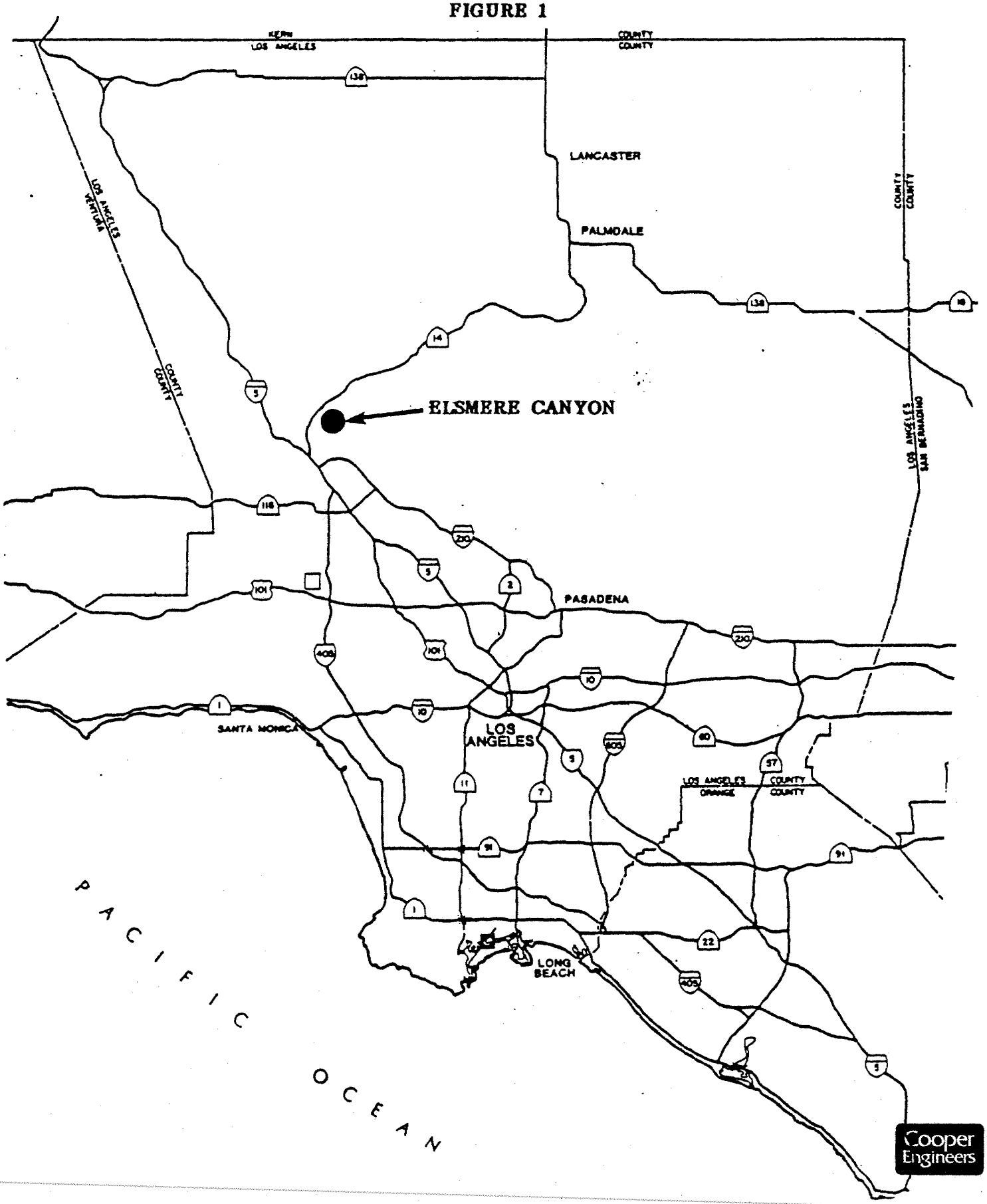


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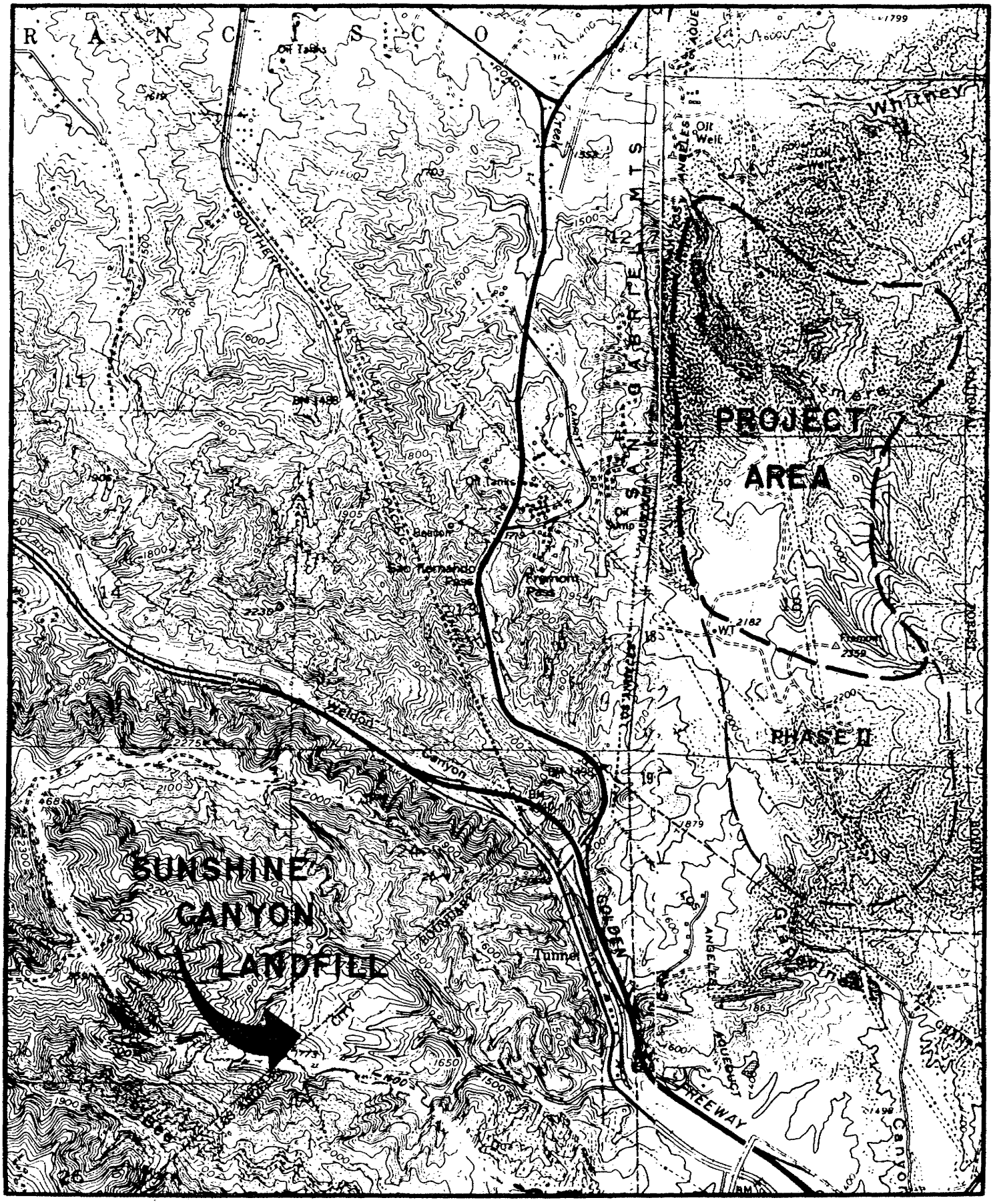
FIGURE 2



PROPOSED ELSMERE CANYON LANDFILL
VICINITY MAP

The report presented in the following sections addresses the above key items. The report first presents a summary of the general waste management system in the greater Los Angeles Area. Based upon this information, an assessment of future landfill capacity is made to give a general picture of the potential waste supply available to the proposed landfill. Next the environmental and geotechnical factors are addressed. Then a presentation of development alternatives, general design and operating criteria, and a preliminary economic evaluation follows. The report is completed with a discussion of planning and permit requirements, and recommendations for future action.

REGIONAL BACKGROUND

LANDFILLS

Most of the solid waste generated in the Los Angeles area is currently disposed of in sanitary landfills. For many years Los Angeles area residents have had sanitary landfills conveniently located near the major metropolitan areas of the County. As a result, the cost for collecting, transporting and disposing of the solid waste has been inexpensive compared to other areas of the State and County.

However, the benefit of having large landfills located close to metropolitan areas in Los Angeles is rapidly being eliminated. The Palos Verdes Landfill, operated by the Los Angeles County Sanitation Districts (LACSD), was closed about two years ago. Before its closure, residents of a small city in the South Bay Area were paying about $4.50 per month per residence for waste disposal at the Palos Verdes site. Since closure of Palos Verdes, the waste is being hauled to other landfills and the cost per resident in that city is now $12.00 per month, an increase of nearly 300%.

These increased costs to the homeowner result from increased costs to transport and dispose of waste in new remote locations. These large potential cost increases were discussed in the environmental impact report for the Puente Hills Landfill expansion. In that report the Los Angeles County Sanitation Districts (LACSD) estimated that additional annual costs of more than $17 million would result if that landfill closed. Closure of the landfill would also result in 350 tons of increased annual emissions from vehicles hauling waste, a 1.5 million gallon increase of annual fuel consumption and increased annual travel of 9 million miles.

Landfill closure can also have regional impacts. Closure of each landfill will have a domino effect by increasing the rate of disposal at other landfills, causing them to close sooner. Denial of the Puente Hills Landfill expansion discussed earlier, would increase disposal by more than 90% at a nearby landfill, effective cutting its life in half. Other nearby landfills would see increases of more than 14%.

In addition to landfills closing, the amount of solid waste being generated within the county is steadily growing. The LACSD estimates that about 35,000 tons of solid waste is being generated and disposed of per day in landfills in Los Angeles County. By the year 2000 they estimate that about 45,000 tons of waste will be generated each day.

Los Angeles County is going to be subjected to additional landfill closures. There are now 19 operating landfills and by 1990 it is estimated that there will be only 11 operating landfills, unless new permits are granted to extend the life of some of these landfills. This is not likely considering recent actions. With the expected landfill closures, the solid waste management system in Los Angeles County will need some significant revisions by the year 2000.

TRANSFER STATIONS AND REGIONAL LANDFILLS AS AN ALTERNATIVE

One of the significant revisions in the solid waste management system has been the establishment of transfer stations to haul refuse to very large but distant landfills. Los Angeles County currently has ten permitted large volume transfer stations, with

eight more being currently proposed. Table 1 is a list of the existing stations with the approximate volume of waste handled in 1982-83. The new transfer stations are listed under Table 2, Proposed Facilities Designated in the Draft Los Angeles County Solid Waste Management Plan Triennal Update.

RESOURCE RECOVERY AS AN ALTERNATIVE

One of the most significant improvements in solid waste management would be utilization of resource recovery facilities to reduce the volume of much of this waste material. One estimate shows that about 60% of the waste generated in this county is combustible. If that is the case, resource recovery facilities could handle more than 27,000 tons of waste per day in the year 2000.

Many communities have seen that solid waste disposal is a growing and continuing problem. There are currently at least 11 resource recovery projects being planned within Los Angeles County. Plans for these facilities range from conceptual to detailed design. However, no facility is currently under construction in the county. Resource recovery can be a technology that can dispose of refuse close to its source of generation given that environmental impacts can be mitigated and economic conditions are favorable. Some of the proposed projects are very close to resolving the economic and other impediments to implementation. As the disposal problem gets worse, we expect even greater interest in resource recovery from many of the cities in the County. Over the next 5-10 years it is expected that these facilities will absorb some of the landfill shortfall.

SOLID WASTE MANAGEMENT PLAN

The County has committed to solve the refuse disposal problem through the County Solid Waste Management Plan. The plan covers a 20-year planning period, during which a 10-year reserve disposal capacity is to be maintained. The reserve capacity is estimated at 80 million tons of additional capacity (equivalent to a current 10-year capacity). According to the Los Angeles County staff the current existing permitted capacity of landfills located in the county is 165 million tons. For the 20-year planning period, the county staff has estimated that 195 million tons of capacity are needed, based on projected waste quantities and an eventual split of 50% resource recovery and 50% landfilling. The current landfill capacity shortfall is estimated by county staff to be 110 million tons (195+80-165=110).

TABLE 1

MAJOR TRANSFER STATIONS IN LOS ANGELES COUNTY
(Larger than 50 Tons per Day)

SITE	OWNERSHIP	LOCATION	1982-83 WASTE VOLUME Tons/Day	DISPOSAL SITE USED
Bel Art Disposal	Private	Long Beach	400	BKK
American Transfer (Action)	Private	Gardena	600	BKK
Falcon Disposal Service	Private	Wilmington	1,100	BKK
Western Refuse Hauling	Private	Carson	1,200	Various
Advance Recycling	Private	Compton	900	Sunshine Canyon
DeGarmo St. Transfer Station	Private	Sun Valley	120	Chiquita
Universal By-Products	Private	Sun Valley	250	N/A
South Gate Transfer Station	Sanitation Districts	South Gate	500	Puente Hills
Santa Monica Transfer Station*	Municipal	Santa Monica	200	Sunshine Canyon
Beverly Hills Transfer Station	Municipal	Beverly Hills	120	Puente Hills

*Not open to the general public.

TABLE 2
PROPOSED FACILITIES DESIGNATED IN THE DRAFT LOS ANGELES COUNTY SOLID WASTE MANAGEMENT PLAN TRIENNIAL UPDATE

Type Facility	Name	Address
Landfill Expansions	Antelope Valley Landfill	1200 West City Ranch Road Palmdale, CA 93550
	Azusa Western Landfill	1201 Gladstone Azusa, CA 91502
	Burbank Landfill	1600 Lockheed View Drive Burbank, CA 91510
	Calabasas Landfill	26919 Ventura Freeway Agoura, CA 91301
	Lopez Canyon	11950 Lopex Canyon Road Pacoima, CA 91331
	Puente Hills	2800 South Workman Mill Rd. Whittier, CA 90607
	Scholl Canyon Landfill	7721 North Figueroa Los Angeles, CA 90041
	Spadra Landfill	4125 West Valley Boulevard Walnut, CA 91789
	Sunshine Canyon	14735 San Fernando Road Sylmar, CA 91352
	Toyon Canyon	5050 Mt. Hollywood Drive Los Angeles, CA 90049
New Landfills (Class II)	Catalina Island	Avalon, CA 90704
	El Gee	11670 Wicks Street Sun Valley, CA 91352
	Elsmere Canyon	14 Sections; 7, 18, 19T3N R15W Baseline Meridian Newhall, CA
	Forest Lawn Memorial Park Hollywood Hills	6300 Forest Lawn Drive Los Angeles, CA 90068

TABLE 2
PROPOSED FACILITIES DESIGNATED IN THE DRAFT LOS ANGELES COUNTY SOLID WASTE MANAGEMENT PLAN TRIENNIAL UPDATE
(Continued)

Type Facility	Name	Address
	Strathern	8300 Tujunga Avenue Sun Valley, CA 91352
	Two Harbors	Catalina Island Avalon, CA 90704
New Landfills (Class III)	Cal Mat	9436 Glen Oaks Boulevard Sun Valley, CA 91352
	Redondo Beach	190th & Flagler Streets Redondo, CA
	Nu-Way Industries, Inc.	400 East Live Oak Avenue Irwindale, CA
Waste-to-Energy Facilities	Avalon Project	Catalina Island Avalon, CA
	Central City Waste-to-Energy Project	City of Los Angeles, CA
	Compton Energy Systems (Advance Transfer Station)	2509 West Rosecrans Avenue Compton, CA 90222
	City of Downey Project	Downey, CA
	City of Gardena Project	Gardena, CA
	City of Industry Project	Industry, CA
	Irwindale Waste-to-Energy Facility	Irwindale, CA
	Puente Hills Project	2800 South Workman Mill Rd. Whittier, CA
	South Gate Project	South Gate, CA

TABLE 2
PROPOSED FACILITIES DESIGNATED IN THE DRAFT LOS ANGELES COUNTY SOLID WASTE MANAGEMENT PLAN TRIENNIAL UPDATE
(Continued)

Type Facility	Name	Address
Transfer Stations/ Processing Facilities	California Disposal Company	1145 South Taylor Street Montebello, CA
	City of Industry Municipal Service Center	Industry, CA
	City of Inglewood Transfer Station	222 West Beach Road Inglewood, CA
	City of Los Angeles Adivari Transfer Station	1733 East Robidoux Street Wilmington, CA 90744
	City of Los Angeles Rubbish Transfer Station	9643 Cozycraft Avenue Chatsworth, CA 91311
	City of Los Angeles Venice Street Maintenance Yard Transfer Station	2000 Washington Boulevard Venice, CA 90291
	City of Los Angeles W&W Transfer Station	9824 Topanga Canyon Blvd. Chatsworth, CA 91311
	City of Los Angeles Westchester Street Maintenance Yard Transfer Station	5223 West 111 Street Westchester, CA 90045
	City of Redondo Beach	190th Street/Flagler Ave. Redondo Beach, CA
	County Road Maintenance Yard	Arrow Highway/Walnut Ave. San Dimas, CA

The County Solid Waste Management Plan has identified 801 million tons of non-permitted capacity at existing and new sites. Table 3, Landfill Capacity Analysis, summarizes these quantities. However, under recent action taken by the Los Angeles City Council, three new proposed landfills located inside the City's limits have been deleted from the plan: La Tuna Canyon (20 million tons), Mission Canyon (23.5 million tons), and Rustic-Sullivan (300 million tons) for a total of 343.5 million tons. The remaining proposed expansions and new Class II landfills could provide 459 million tons of landfill capacity to offset the 110 million ton shortfall. The Los Angeles City Council, by deletion of three tentative sites, has committed itself to an ambitious waste-to-energy and recycling program.

TABLE 3
LANDFILL CAPACITY ANALYSIS

Proposed Class II Expansions

Landfills	Expansion Capacity (Million Tons)
Puente Hills	79
Sunshine Canyon+	217
Lopez Canyon*	10
Toyon Canyon*	4.5
Spadra	2
Calabasas	14
Scholl Canyon	15
Azusa Western	1
Antelope Valley	N/A
Burbank	9
Total	351.5

Proposed New Class II Landfill Sites

Landfills	Capacity -No Deletions- (Million Tons)	Capacity -W/Deletions- (Million Tons)
El Gee*	15	15
Strathern*	5	5
Mission Canyon*	23.5	-
La Tuna Canyon*		
1. La Tuna Canyon Property	20	-
2. Las Barras Canyon	N/A	-
3. BKK Corporation	N/A	-
Elsmere Canyon	75	75
Nu-Way Landfill	12.5	12.5
Rustic-Sullivan*	300	-
Total	451	107.5
TOTAL CAPACITY	801 million tons	459 million tons

*Located within the City of Los Angeles.
+Current disposal activities located in City of Los Angeles. Expansion 80% within the unincorporated county area.

WASTE SUPPLY

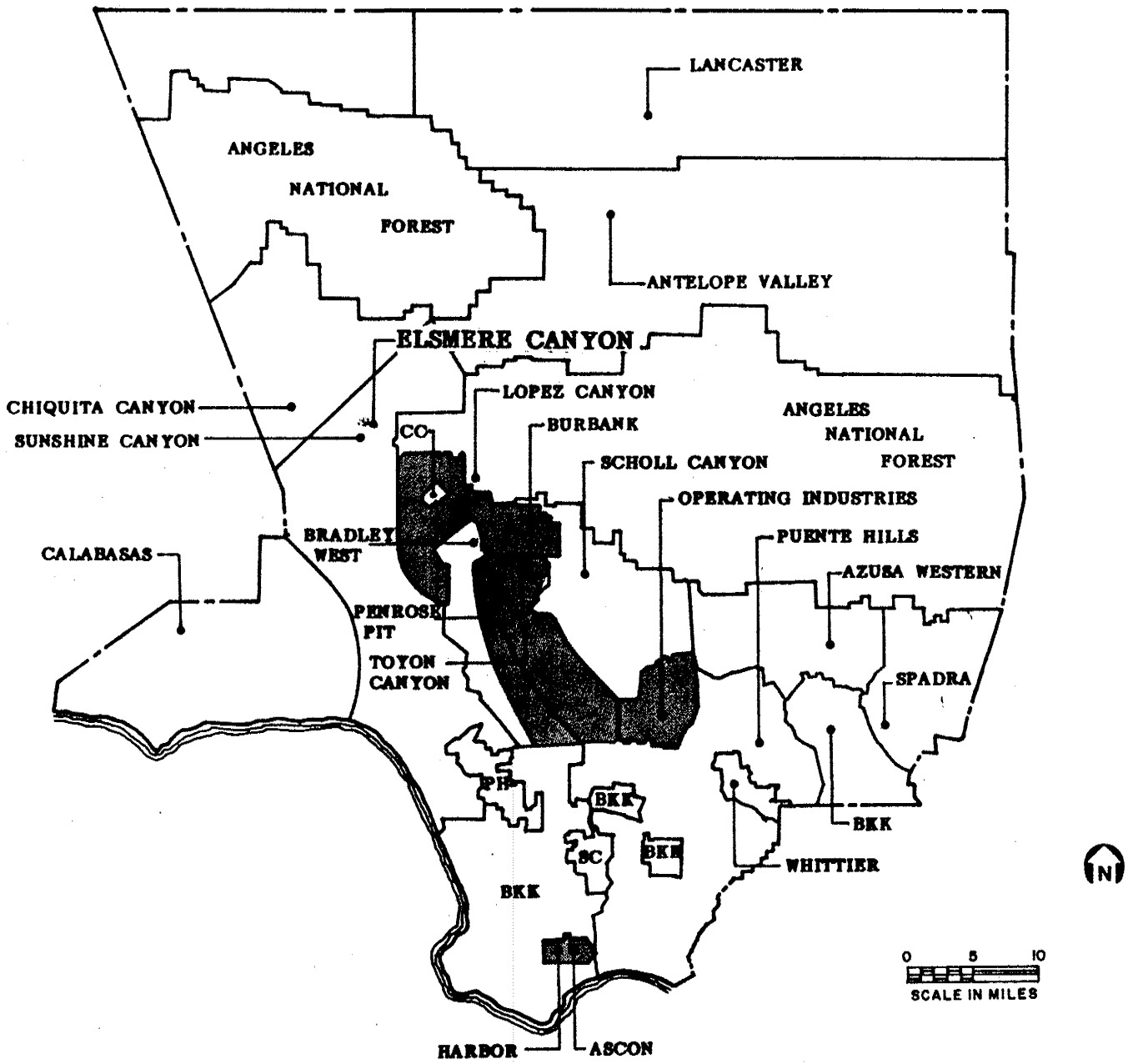
The supply of waste is a critical element in the proposed disposal site's feasibility. An adequate amount of waste material must be delivered to the facility to maintain a successful operation. Since Los Angeles County has a 110 million ton deficiency in permitted landfill volume over the next 20-year planning period, adequate waste appears to be available for the proposed facility. However, it would be desirable for the landfill operator/owner to obtain firm commitments for waste from haulers and/or the City of Los Angeles prior to construction. The discussion below gives an estimate of the waste supply that is potentially available for the Elsmere Canyon Landfill.

Figure 3, Location and Service Area of Landfills in Los Angeles County, shows the locations of all landfills in the County and the location of the proposed Elsmere Canyon Landfill. Table 4, Landfills Operating in Los Angeles County, presents pertinent data on these landfills. Six of these landfills are expected to close in Los Angeles County before 1991. Table 5, Los Angeles County Landfill Closures before 1991, lists their owners and operators. The closure of the six landfills will leave a disposal capacity deficiency of about 2,404,000 tons/year (6,500 TPD_7*). The wasteshed of these landfills is shown as the cross-hatched area on Figure 3. This figure indicates that a good portion of this wasteshed subject to landfill closure is relatively close to the proposed site.

*TPD_7: tons/day based on a seven day week.

LOCATION AND SERVICE AREA OF LANDFILLS IN LOS ANGELES COUNTY

FIGURE 3



BKK - BKK Wasteshed

CC - Chiquita Canyon Wasteshed

PH - Puente Hills Wasteshed

SC - Sunshine Canyon Wasteshed

LC - Lopez Canyon Wasteshed (Angeles National Forest is not a part of the Lopez Canyon Wasteshed).

- Closing Landfill Wasteshed

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TABLE 4

MAJOR CLASS I AND II LANDFILLS
OPERATING IN LOS ANGELES COUNTY

Landfill	Classification	Owner/Operator	Quantity of Waste Disposed Tons/Year (1982) Group 2	Group 3	Nonhazardous Liquid	Sewage Sludge	Remaining Permitted Capacity Million Tons	Calculated Closing Date	Tipping Fee* Dollars/Ton
Puente Hills	II	LACSD	2,232,000	275,000	235,000	170,000	3.4	1993	3.75 **
BKK	I	BKK Corporation	2,200,000	-	115,000	-	36.5	2000	3.75
Sunshine Canyon (North Valley)	II	Browning-Ferris Industries (BFI)	1,100,000	330,000	-	-	39.0	1991	— ***
Bradley West	II	Valley Reclamation Company	300,000	75,000	-	-	11.3	2012	5.00
Scholl Canyon	II	LACSD	698,000	110,000	-	-	7.7	1992	5.00
Lopez Canyon	II	City of Los Angeles	372,000	180,000	-	-	5.1	1991	-
Calabasas	II	LACSD	360,000	90,000	-	-	2.8	1988	3.75 **
Operating Industries	II	Operating Industries, Inc.	271,000	18,000	74,000	-	1.0	1985	4.00
Toyon Canyon	II	City of Los Angeles	404,000	306,000	-	-	0	1983	-
Azusa Western	II	Azusa Land Reclamation Company	465,000	58,000	-	-	14.6	2010	5.00
Spadra	II	LACSD	303,000	38,000	1,400	-	3.9	1993	3.75 **
Penrose Pit	II	Los Angeles Byproducts, Inc.	280,000	430,000	-	-	2.1	1985	5.00
Whittier	II	City of Whittier	95,000	15,000	-	-	5.3	2030	6.00
Chiquita Canyon	II	Newhall Land and Farming Company (owner)	95,000	5,000	-	-	4.6	2028	6.00
Burbank	II	City of Burbank	50,000	4,000	-	-	0.43	1990	-
Antelope Valley	II	Santa Clarita Disposal Company	80,000	14,000	-	-	0.71	1990	5.00
Lancaster	II	Waste Management, Inc. (owner)	50,000	16,000	-	-	0.26	1986	5.00
Ascon	II	Watson Energy Systems	-	-	-	-	0.30	-	-
Harbor	II	City Disposal, Inc., and Waste Recovery Systems, Inc.	82,000	18,000	-	-	0.50	1987	12.00
Total			9,437,000	1,982,000	425,400	170,000	139.5		

*Updated from information in the LA CoSWMP.

**Sites operated by LACSD will have a July 1984 tipping fee increase to $5.00/ton.

***Tipping fees for Sunshine Canyon are not listed. Charges vary and are based on volume (no scales at site). Based on limited data it is estimated that average disposal fees are $5.00/ton or more.

TABLE 5
LOS ANGELES COUNTY LANDFILL
CLOSURES EXPECTED BY 1991

Landfill	Closure Date No Expansion	Closure Date With Expansion	Fill Rate 1984 (Tons/Yr)
Toyon Canyon	1985		700,000
Operating Industries	1984	N/A	290,000
Penrose Pit	1985	N/A	810,000
Harbor	1987	N/A	100,000
Burbank	1990	2000+	54,000
Lopez Canyon	1991		450,000
TOTAL			2,404,000

Information from draft 1983 Los Angeles County Solid Waste Management Plan.

Proposed new sites are listed in Table 2, Proposed Sites Designated in the Draft Los Angeles County Solid Waste Management Plan Triennial Update (CoSWMP). Of the proposed resource recovery projects listed, several could provide disposal alternatives to the waste stream of the six closing landfills. The CoSWMP has developed two scenarios (A and B) of waste disposal during a 20-year period. Both scenarios have the waste stream diverted from the closing facilities to Sunshine Canyon Landfill which is located in close proximity to Elsmere Canyon. Scenario A is based on the implementation of no additional solid waste facilities in the future, except for the three planned waste-to-energy facilities. Scenario B is based on the implementation of all the proposed landfill expansions listed in Table 2 along with the three planned waste-to-energy facilities. In either case more than 2,000 tons/day of waste are expected to be diverted to the Elsmere Canyon/Sunshine Canyon area landfills, with some diverted to other waste-to-energy facilities now in the permit procurement/design stage.

There are several major actions which could significantly change the capacity calculations. Sunshine Canyon must obtain additional permits to gain its expansion capacity. There is considerable local opposition to this expansion. The BKK disposal site has recently been ordered to reduce its volume of hazardous liquids due to a potential leakage problem. If this problem cannot be resolved, the site might have to reduce its hazardous waste disposal activity, leading to a potential reduction in solid waste disposal as well.

The success in obtaining the waste necessary to operate the Elsmere Canyon facility will depend on effectiveness of marketing the landfill capacity to the service area of the six closing landfills. The marketing effort to obtain the volume should target the companies planning to construct transfer stations.

ENVIRONMENTAL EVALUATION

BIOTIC RESOURCES

The site under consideration contains foothill woodland and chaparral biotic communities typical of the San Gabriel Mountains at this elevation. South-facing slopes and ridgetops are generally vegetated with low, shrubby plants, including several species of sagebrush, sage, chamise, and occasional live oaks. Canyon bottoms and more shaded slopes support foothill woodland with live oaks predominant and smaller shrubs and herbaceous plants occurring in these moister locations. Some limited grassland areas also occur, which are subject to grazing. There are no riparian areas on the site due to a lack of a permanent water supply.

Development of the property into a landfill would alter the existing biotic community significantly, due to road construction, traffic generation, filling of canyon areas, and other activities related to landfill operations. However, this plant community is very common throughout southern California and the anticipated impacts to it are not expected to be of great concern to regulatory agencies or the public. Protected, rare or endangered plant or animal species are not expected to be impacted, since they tend to occur in less common biotic communities. The site would not be expected to be used frequently, if at all, as a foraging area by the endangered California Condor. This bird resides in more remote areas of the Los Padres National Forest, approximately 25 miles west of the site, and tends to avoid developed areas.

A search is presently being conducted through the computerized data base files of the California Department of Fish and Game to confirm the absence of any sensitive species in the project area. This analysis will provide a more certain basis for the determination of sensitive species on site. The Project sponsors would be required to obtain an agreement from the Department to fill any stream areas, including intermittent streams.

CULTURAL RESOURCES

The site lies in an upland area, which would have a relatively low potential for containing cultural resources. An archeological reconnaissance and clearinghouse check would be required to confirm the presence/absence of cultural resources.

TRAFFIC

Traffic impact would primarily be noted on major arterials and freeway to be used by refuse trucks and transfer trailers using the site. New access roads would be built with sufficient storage capacity to keep lines of waiting vehicles from backing onto travelled roadways. Traffic impacts should not be a major problem.

NOISE

Noise generated on-site would generally be confined on-site due to the canyon features of the site. Noise from the freeways would tend to drown out any noise from the site. The nearest land use is a refinery on the west side of Route 14.

AESTHETICS

Landfill operations would generally be hidden from view. Final slopes would be reseeded.

GROUNDWATER

Any naturally occurring groundwater is of low quality, high in contaminants, and very deep under the landfill. The site would be designed to meet regulatory standards.

HEALTH AND SAFETY

The site would be operated according to established standards.

GEOTECHNICAL/GEOLOGICAL AND HYDROGEOLOGICAL CONDITIONS

This summarizes the preliminary geotechnical investigation conducted by Cooper Engineers in association with Alvin L. Franks, Ph.D. for the Elsmere Canyon Landfill Feasibility Study. An expanded discussion of this geotechnical investigation is included as Appendix A.

DATA REVIEW, FIELD EXPLORATION AND LABORATORY TESTING

To accomplish the objectives of this part of the investigation, Cooper Engineers compiled and reviewed available, pertinent geotechnical, geologic, hydrologic and hydrogeologic information for the site.

The subsurface conditions in a portion of the site were explored by excavating five test pits to depths ranging from 8 to 14 feet, at the locations shown on the Geologic Map Plate 1. A detailed description of the field exploration and laboratory analysis. is presented in Appendix B to this report.

GEOLOGY

The Elsmere Canyon Site is located near the center of the Transverse Range Geomorphic Province. In general, the Province is characterized by very complex geologic relationships and, as the name implies, an east-west structural grain which lies transverse to the northwest-southeast grain characteristic of much of Southern California. The site is at the west end of the San Gabriel Mountains, just east of San Fernando Pass. The pass forms the geographic boundary between the San Gabriel and the Santa Susana Mountains to the west which are considered part of the Ventura Depostional Basin.

As shown on Plate 1, Geologic Map, the proposed Elsmere Canyon Landfill site is almost entirely underlain by Tertiary age sedimentary rocks. Only the extreme northeast corner of the site is underlain by Miller's basement complex granitic intrusives. The sedimentary rocks underlying the site consist of the Pico and Towsley formations and an unnamed group of Eocene age silstones, sandstones and conglomerates. To the north, in Whitney Canyon, wells in the Eocene rocks have yielded some oil and, reportedly, some of the more friable sandstone beds in Elsmere Canyon are tar saturated with occasional oil seeps along fractures.

GEOLOGIC STRUCTURE AND SEISMICITY

All of the sedimentary units in the Elsmere Canyon area have a regional dip to the west of about 35 degrees. However, regional faulting has impressed gentle, westward plunging folds on the regional structure. The dip slope condition in the southern portion of the site has likely contributed to the development of the widespread landsliding in the Towsley formation south of Fremont Peak. In addition to the folding, faulting has stratigraphically displaced the rocks within the site area.

Seismically, there are no known active faults through or immediately adjacent to the site. The San Fernando Fault Zone is located about one mile south of the site. The San Gabriel Fault is located about 2½ miles northeast of the site. Although there is no known geologic evidence of activity, the San Gabriel Fault is considered potentially active based on its association with the San Andreas Fault. The active San Andreas Fault is located about 21 miles to the northeast. On the basis of its proximity to known active and potentially active faults, it can be anticipated that the site will be subjected to strong groundshaking during its useful life.

GROUNDWATER CONDITIONS

The rocks underlying the proposed site and its vicinity are considered to be part of non-water bearing rock series of the Santa Susana and San Gabriel Mountains. They are, for the most part, relatively impervious and therefore, store comparatively little water. Water yield to wells drilled in these sediments is very low. As would be suggested by the tar and oil content of the rocks, the quality of the water found is generally unsuitable for most beneficial uses. There are no known wells in or adjacent to the proposed site.

SOIL CONDITIONS

Soil conditions at the site consist of a mixture of residual and colluvial types which mantle the ridgelines, sideslopes and valleys.

The test pits indicated the near-surface soils to consist of brown to dark brown, medium stiff to stiff, clayey silts with traces of sand and gravel. Underlying this layer, to the depths explored, were brown, medium stiff silts; moderately weathered, soft, sandy siltstone; and moderately weathered, soft, sandstone.

Additional subsurface exploration should be performed to better define subsurface soil conditions. The preliminary investigation showed that sufficient materials are on-site for cover purposes. However, it could not be confirmed whether sufficient low permeability materials are available on-site for bottom or cover liner material.

GEOLOGIC CONCLUSIONS AND RECOMMENDATIONS

- The conclusions and recommendations presented herein are general in nature, and are based on a brief site reconnaissance, limited subsurface exploration and on our interpretation of geotechnical conditions. A more detailed investigation will be required to address specific geotechnical considerations and provide landfill design criteria.

- The proposed appears to be site is geologically and geotechnically suitable for development of a MSW sanitary landfill. There do not appear to be any geologic hazards which would preclude development of the site for disposal of household wastes. There are no known active faults within the site and the underlying materials do not contain significant quantities of groundwater. The groundwater that is present likely has little beneficial use due to contamination by naturally occurring deposits of tar and oil. Except for the dip-slope area south of Fremont Peak, natural slope stability appears to be reltively good.

- Based upon the laboratory test results, the near surface clayey silts may not be suitable for use as final cover material. In general, coefficients of permeability was less than 1×10^{-5} cm/sec but higher than 1×10^{-6} cm/sec.

- Based upon our preliminary review of the existing site conditions and the performance of existing roadway cuts at the site, temporary cut slopes of up to 20 feet in height, excavated at slopes no steeper than 1½:1 (horizontal to vertical) should be considered feasible. Sloughing, ravelling and erosion of cut slopes should be anticipated.

- All vegetation in portions of the site to be excavated should be cleared. To minimize surface erosion, cleaning should be performed in stages as the landfill is expanded across the site. Unsuitable material should be removed and all near-surface clayey or silty soils should be stockpiled as cover material.

- For normal operating procedures, most of the excavated on-site clayey silts or silty soils should be suitable for daily cover. Additionally, it appears that much of the near-surface, weathered rock would be suitable for daily cover.

- Consideration should be given to excavation and operation procedures that will minimize impact due to erosion, such as to limit sheet and rill erosion of cut slopes and to minimize sloughling of cut slopes.

- A comprehensive revegetation program will need to be developed for planting of the site following closure of the landfill.

DEVELOPMENT AND DESIGN CRITERIA

DISCUSSION OF ALTERNATIVES

The proposed landfill would be implemented by using the land that is currently owned by Chevron, USA, Robert Symonds, City of Los Angeles Department of Water and Power, and Barbara Letourneur. The property owned by Barbara Letourneur would be the initial area for development of the proposed landfill. Operations at the site were developed to allow disposal of an estimated waste tonnage of about 730,000 cy/year (2000 tons/day). This quantity seems a reasonable target for initial operation. However, higher throughputs can easily be accepted at the site. Three alternative final grading plans were prepared for preliminary evaluation and discussion. The first alternative is shown on Sheet 1. This alternative is designed to maximize the volume on all four parcels of property with the power transmission lines re-routed to accommodate more landfill volume. The second alternative is shown on Sheet 2. This alternative utilizes the same portion of land as Alternative I, but the transmission lines were not re-routed to accommodate more landfill volume. The third alternative is shown on Sheet 3. This alternative is designed to maximize the volume on the parcel of property owned by Ms. Letourneur.

In evaluating the alternatives, it is important to take into consideration the location of the major portion or bulk of the landfill capacity. This is important at this preliminary feasibility stage of the project so that the landfill's final design will allow the most economic manner of filling. For example, during the preliminary feasibility stage of discussion and evaluation, the final grading contours may be changed (to be compatible with final land use, etc.). What may appear to be minor adjustment, however, could greatly impact the final capacity if the bulk of the volume is located in the area of the change. On the other hand if the major volume is at the lower elevations, the final contour design could be altered to fit any particular need without a major impact on the final capacity.

Alternative I

Alternative I evaluates the landfill's ultimate capacity. This alternative requires the purchase or purchase/lease of 941 acres; 160 acres currently under option, 394 acres to the south and an additional 386 acres to the north. The transmission lines need to be re-routed to accommodate more landfill volume. Relocation has conceptually been shown on Sheet 1 but would need to be confirmed by the LA Department of Water and Power. The need to relocate these lines will not occur until about 40% of the capacity is used (80 years at a 2,000 TPD waste disposal rate). Prior to this time detailed planning and engineering will be needed to develop relocation plans. The capacity gained by relocating the transmission lines and filling in the void is 131% greater than filling around and under the lines. This alternative will have a final refuse capacity of 140 million tons for a life expectancy of about 200 years, assuming the waste disposal rate of 2,000 tons/day. The final contours can be adjusted to accommodate just about any final land use plans proposed because the majority of the landfill's capacity is in the lower elevations. Although not detailed on the plans (Sheet 1), the site could be expanded southward to gain 20-40 million tons of capacity (30-60 years). However, significant additional work to move utility lines would be needed.

Alternative II

Alternative II would require the purchase or lease/purchase of the same 941 acres as Alternative I. The area under the transmission lines would be filled or regraded to provide easier access and drainage. This filling alternative will have a final capacity of 60 million tons for a life expectancy of about 85 years, at a constant 2,000 tons/day waste disposal rate. The final contours can be adjusted to accommodate about any final land use plan proposed because the majority of the landfill's capacity is spread out over the lower elevation on both the east and west side of the powerlines. Alternative II could be the first phase of Alternative I. This would allow filling for a considerable time, with relocation of powerlines sometime in the future.

Alternative III

Alternative III evaluates the central Barbara Letourneur parcel. This filling alternative will have a final refuse capacity of 9 million tons for a life expectancy of 12 years, again assuming the waste disposal rate of 2,000 ton/day. The majority of the capacity is located on the western side of the transmission lines, between elevation 1,960 and 2,090 feet above mean sea level (3,300,000 cy). This volume is mid-height of the fill area so it is possible that adjustments in the contours could have a significant impact on the capacity of this alternative.

FACILITY IMPROVEMENTS

A number of major capital improvements would be necessary for the development of the landfill. These include the installation of a paved access road to the facility's entrance, weigh scale(s), scalehouse, employee facility, maintenance building, fueling station, landscaping, and an on-site all-weather gravel access road (6 inches of 3/4-inch gravel) to the active face. A water supply must be developed for dust control, fire fighting and drinking water.

The large size operation of the proposed landfill would require the availability of adequate truck weighing scales. The vehicle count at the landfill could be as high as 200 per day, which, if averaged over an 8-hour day, would mean one every 2 minutes. During peak periods the traffic count should exceed one per minute, requiring an additional scale. If a large fraction of the traffic is transfer vehicles, these could be weighed at the transfer stations alleviating the need for the second scale. However, if this is not the case, one scale would be needed for each in-bound and one for each out-bound vehicle. The scales should be located where additional room is available so scales can be added as the traffic increases and staff support facilities can be built. The scalehouse would have to be attended every working hour of the site by two full-time employees during the week, two part-time employees during the weekend, and one employee as an alternate to substitute as needed.

There are no access roads to the site that would handle the heavy expected traffic. There are three possible areas that could be developed as an entrance to the facility. A south entrance, north entrance and middle entrance. General design criteria to entrance and access roads are as follows:

- o Maximum grade of 10 percent.
- o Sufficient structural strengh to handle the maximum allowed truck axle loads.
- o Entrance roads located where a scale facility could be constructed and expanded when necessary.
- o Entrance should have pleasing aesthetics.

The best entrance alternative is the north entrance (see Sheet 1). The area has easy access from State Highway 14, a large flat area for a scale facility, and moderate road grades. The south entrance would require more extensive and difficult road construction work (more difficult terrain) and would require a long climb before reaching the disposal area. A south entrance would become more attractive if the site expands operations to the south. The mid-entrance is not really feasible since a considerable amount of material must be cut to provide minimum roadway grades, and a new roadway must be built to replace the existing Caltrans frontage road. There isn't sufficient room for scales and related facilities at this entrance either.

A fueling station and maintenance yard for landfill equipment should be provided. The fueling station should include an underground 15,000 gallon diesel tank and an underground 5,000 gallon gasoline tank with the appropriate pumps and plumbing. Fueling of equipment however, would generally be done from a mobile fuel/lube truck. The maintenance yard should be fenced-in with a portion of it covered to provide storage for lubricants, hand tools, and one or two pieces of landfill operating equipment for maintenance purposes.

A water supply in the range of 75-100 gal/min should be developed for domestic, dust and fire control purposes. An elevated storage tank (about 8,000 gallon capacity) should be provided to store water.

GAS MIGRATION CONTROL

Migration of landfill gas (50% methane) that would be generated at the proposed landfill should not be a major problem. The remoteness of the site, and the buffer areas around the site are factors that should alleviate the need to install a gas migration control system. Gas monitoring probes, however, should be installed along the property boundary in areas where refuse is deposited in close enough proximity to possibly cause as accumulation. They are continuously monitored for as long as a gas migration problem might exist.

LEACHATE CONTROL

Leachate generation at the proposed landfill is not anticipated to be a major problem due to the following factors:

- The final contours of the landfill are designed to promote surface water runoff and drainage and allow for significant differential settlement without creating ponded water areas.

- Final land reclamation will occur concurrently with the filling operation. As one portion is filled to final grade, a cover layer of 3 feet of soil would be placed over the refuse and stabilized to prevent infiltration, erosion and slumping.

- Historic rainfall data indicates that a low-to-moderate rate of rain occurs at the site (average of 12 inches per year).

- The geotechnical characteristics of the site are such that there is sufficient separation between the refuse bottom and any usable groundwater to attenuate any leachate discharge.

Therefore, a clay liner at the bottom of the refuse fill or a leachate control system may not be required. Groundwater monitoring wells must be installed up stream and down stream of the fill. Periodic monitoring would indicate any degradation due to leachate infiltration and allow corrective actions to be taken. There is sufficient buffer area at the low ends of the landfill to install leachate collection lagoons, if leachate seeps are formed.

SURFACE WATER AND SITE DRAINAGE

The points and quantities of surface water discharge from the site would not change. Surface water generated upstream would be diverted around the site, and surface runoff from the site would be discharged after settling out of any suspended sediments. This would cause no increase or decrease in historical discharge volume at the point where the runoff leaves the site. The anticipated discharge for a 100-year storm was calculated to be as great as 730 second-feet. During the initial start-up period no major surface water diversion runoff is anticipated since filling will be confined to minor drainage basins. However, as filling proceeds a major drainage diversion channel will be necessary to discharge drainage from the Elsmere Canyon drainage basin. These would be constructed by excavating and using the spoils as cover. Therefore, the cost would be considered part of the operation. Drainage from excavation areas and similar areas should be channeled to a temporary sedimentation basin. The top and side slopes of the final fill should be maintained at a minimum 3% grade to promote drainage and a maximum grade of 2½:1 (horizontal to vertical). The final slopes should be seeded with grass or other natural vegetation to reduce surface erosion.

DISPOSAL SITE OPERATION

Operations should start in the north-south trending arm of Elsmere Canyon located on the Letourneur property. Proposed fill sequencing is shown on Sheet 4. The simultaneous excavation of the side hills would accompany the placement of refuse in the canyon. This type of fill sequencing should be used throughout the site to obtain sufficient cover material. Any leachate barrier and/or collection system should be installed, needed.

The filling technique shown on Sheet 4 is called modified area-fill/canyon-fill type method. Initially waste is spread and compacted on levelled soil pad in 15- to 20-foot lifts. Upon completion of each lift, another would be started on top of the previous one. Cover material is obtained directly from excavation areas located on the side hills, or nearby stockpiles during the winter.

Refuse is unloaded onto a centrally located dumping apron or pad. A single D9L bulldozer could push about 2,000 tons/day to the active face if 65% of the waste is delivered to the site in transfer trailers. Since this approaches the effective limit of this piece of machinery, a stand-by may be needed. Two landfill compactors should be provided for refuse compaction. One compactor can effectively work up to 1,200 tons per day.

The amount of soil material to be excavated per year for cover is about 310,000 cy. This amount of soil would provide daily (6 inches), intermediate (12 inches), and final cover (3 feet) for 1,240,000 cy (730,000 tons) of solid waste. A ratio of four parts refuse to one part cover was used for design. The equipment required to excavate and to move the 310,000 cy of soil material per year was based on the following design criteria:

- Maximum one-way haul distance of 2,000 feet.
- Maximum haul road slope of 10 percent.
- Cover material required for summer - May through September - 210,000 cy.
- Stockpile of cover material required for winter - November through April - 100,000 cy.
- Production rate for a Caterpillar 627 earth scraper/mover is 180 cy/hr.

This would require a total of 1,750 hours of equipment use per year. More cover soil is excavated during the summer to provide stockpiles for winter wet weather operations. Two Caterpillar 627's working an average of 5 hours per day, can handle the work load easily during the summer months, leaving sufficient time for maintenance and downtime. Additional equipment could be rented if needed.

A water truck should be available at all times during cover excavation and compaction to minimize the generation of dust. Dust collected on transmission lines negatively impacts their transmission efficienty. They are currently cleaned every 54 days. However, this sequence may have to be increased at an additional cost to the site.

The recommended complement of equipment for operation of this site which was used for economic evaluation is shown on Table 6.

TABLE 6
RECOMMENDED MINIMUM EQUIPMENT LIST
FOR A 2,000 TONS PER DAY SITE

Equipment Type	Quantity	Unit Cost* New	Unit Cost* Used	Total Cost New	Total Cost Used
Landfill Compactor	2	$284,000	N/A	$568,000	$568,000
D9L Dozer	1	455,000	N/A	455,000	455,000
627 Tandem Powered Scrapers	2	400,000	160,000	800,000	320,000
D8L Dirt Dozer	1	340,000	136,000	340,000	136,000
Water Truck	1	N/A	20,000	20,000	20,000
Motor Grader	1	140,000	80,000	140,000	80,000
Lube Truck	1	N/A	70,000	70,000	70,000
			Total	$2,393,000	$1,649,000

* Based on 1984 equipment purchase quotations and list prices.

ECONOMIC EVALUATION

Site development and operating cost estimates were prepared for the three alternatives and are outlined on Tables 7 and 8. These costs must be considered very rough, "order of magnitude" costs which were developed for planning purposes only. More refined and detailed cost estimates would require much more detailed design and considerably more refined estimating activities than possible in this preliminary feasibility study. However, they are adequate for preliminary financial planning.

Following is a summary of assumptions and information sources:

- Property purchase cost was assumed to be ~$3,500/acre, based on the purchase option agreement between Barbara Letourneur and Landfill & Ecology Corps.

- The scale, scalehouse, maintenance structure, fuel station, employee facility and landscaping cost were derived from previous Cooper Engineers estimating experience.

- The access road was assumed to cost $1.20 per square foot for paving and base. An additional cost was added for earthwork.

- Engineering cost includes preliminary design, EIR, final geotechnical/geological report, detailed landfill design, detailed building design, permit acquisition and construction layout.

TABLE 7
SITE CAPITAL INVESTMENT

	Alternative I & II	Alternative III
Property		
160 acres	560,000	560,000
790 acres	**	N/A
950 acres total		
Powerline Relocation	?*	N/A
Scales (2)	100,000	100,000
Scalehouse	35,000	35,000
Maintenance Structure	50,000	50,000
Fuel Station	40,000	40,000
Access Road	250,000	250,000
Employee Facility	25,000	25,000
Landscaping	10,000	10,000
Engineering	350,000	250,000
Total	$1,420,000	$1,320,000
Equipment (New)	$2,390,000	$2,390,000
(Used)	1,600,000	1,600,000

* The cost to move the powerlines for Alternative I is unknown but would be significant. However, capital for such a move could be raised during the first 10-15 years of site operation before the lines need to be moved. If a $0.10/ton surcharge was initiated, it would raise about $10 million dollars during a 30-year time period, including accured interest.

**To be leased for minimal consideration.

TABLE 8
ANNUAL OPERATING COST

	Alternative I & II	Alternative III
Administrative Overhead	$100,000	$100,000
Wages	975,000	975,000
Fuel & Lubricants	180,000	180,000
Equipment Maintenance	400,000	400,000
Engineering	80,000	80,000
Site Maintenance	50,000	50,000
Site Overhead (Supplies, Utilities Misc.)	40,000	40,000
Property Tax	20,000	6,000
Insurance	50,000	50,000
Contingency	100,000	100,000
Capital Amortization 30 yrs. at 14% (Alternative I & II) 12 yrs at 14% (Alternative III)	205,000	230,000
Equipment Amortization		
5 yrs. at 12% (New)	650,000	650,000
5 yrs. at 12% (Used)	440,000	440,000
Total		
New Equipment	$2,850,000	$2,861,000
Used Equipment	$2,645,000	$2,651,000
Cost per ton/First year at 2,000 TPD		
New equipment	$3.90*	$3.92
Used equipment	$3.62*	$3.63

* A surcharge may need to be added for Alternative I to allow moving the power poles.

- The selection of landfill equipment and its cost was based on previous project experience of the consultant and confirmed through contacts with equipment vendors. Table 9 summarizes the quantity and type of equipment required for an efficient operation and gives estimates of costs for new and used equipment.

The operating costs were developed for a project assumed to receive 2,000 tons of refuse per day. If the actual amount of refuse differs, the operating cost should be adjusted accordingly. A larger operation could benefit somewhat from economy of scale. A summary of the major assumption used in developing operating cost is as follows:

- Labor costs are summarized in Table 10. It was assumed that the site would operate as a union shop, with benefits paid through the union. A non-union operation could yield a 10%-20% cost savings. Costs were obtained by comparing union rates for the types of jobs outlined.

- Fuel and lubricant cost were based on previous experience of the consultant and confirmed by comparing with standard fuel use factors illustrated in the 1983 Caterpillar Performance Handbook.

- Equipment maintenance and repairs could vary somewhat from the figures given. Our estimates were purposely conservative, using an average cost of 14% of new equipment cost. Maintenance costs can be assumed using the following industry guidelines:

Year	Maintenance Cost % of New Equipment Cost
1	Warranty - 2%
2	6%
3	10%
4	14%
5	18%
6 and up	18-20%

TABLE 9
RECOMMENDED MINIMUM PERSONNEL
REQUIRED FOR DISPOSAL OF 2,000 TONS PER DAY

Position	Quantity	Hours Year	Hourly Rate $/Hr.	Cost
Supervisor	2	2,080	$35	$145,600
Equipment Operator				
Full-time	5	2,080	27	280,800
Part-time	3	1,000	27	81,000
Scale Person				
Full-time	2	2,080	20	83,200
Part-time	3	1,000	20	60,000
Mechanic	3	2,080	28	174,800
Site Labor	6	2,080	12	$149,800
			TOTAL	$975,200

Note: All union employees
All hour costs include benefits

- The annual engineering costs reflect setting grade control, preparing drainage control plans and specifications, groundwater monitoring, and preparing an annual operation plan.

- The site maintenance, site overhead, property tax and insurance cost are based on previous experience of the consultant.

PROJECT IMPLEMENTATION

PROJECT FEASIBILITY

The technology aspects of waste supply, environmental factors, geotechnical factors, site development options, general design criteria, and a preliminary economic assessment were presented in the previous sections of the report. Cooper Engineers believes that based on a preliminary feasibility assessment the site appears well suited for development into a municipal solid waste (MSW) disposal facility meeting the siting requirements of the State Water Resource Control Board for such a facility. The Board recently adopted new regulations defining certain classes of disposal sites. Sites accepting only MSW are now classified as a Class III site (previous equivalent designation was II-2). The determination of preliminary feasibility is based on the following findings:

- There will be a shortfall of 6,000 tons/day of landfill capacity due to landfill closure by the beginning of the 1990's. The City of Los Angeles Toyan Landfill is expected to be closed by 1985 (2,000+ tons/day) with no alternative available in the near future. A large portion of this shortfall is in the Los Angeles and San Fernando Valley area. Some of this shortfall is expected to be absorbed by waste-to-energy facilities. The nearby Sunshine Canyon Landfill would be a direct competition for this waste stream. However, its long-term capacity to accept these wastes are dependent on getting approvals for expansion from the City and County of Los Angeles. There has been significant citizen opposition to this expansion.

- Based on a waste supply of 2,000 tons/day, the site could be operated at a gate fee of about $3.90/ton during its first year of operation assuming the use of all new equipment. These fees could be reduced by about $0.30/ton if used equipment is purchased.

- The facility would have an ultimate life of over 200 years, if utility lines are moved, assuming as 2,000 ton/day waste input (Alternative I). The life would be about one half of that (100 years) without the movement of utility lines (Alternative II). The site would have 12 years of life using only the center parcel (Alternative III).

- There appears to be no geotechnical, geological, or hydrogeological factors mitigating the suitability of the site. The pertinent geotechnical findings are as follows:

  - Sufficient cover material can be generated on site through excavation and ripping.
  - The underlying groundwater is insignificant in quantity, likely is contaminated by naturally occuring deposits of tar and oil, and would have little beneficial use. Based upon known information the site should not pose a threat to contamination of usable groundwater.
  - Natural slope stability appears to be relatively good, except for the dip-slope area south of Fremont Peak. This area is not considered for development at this time.
  - There are no known active faults within the property which would preclude development of the site as a disposal site for MSW.

- A capital investment of about $200,000 is needed to support permit procurement activities (engineering, EIR, etc.). About $3 to 4 million of capital would be needed for site improvements, property acquisition, and equipment. An undetermined amount would be needed eventually to relocate utility lines.

- A preliminary environmental investigation concluded that there appear to be no unmitigable environmental impacts.

RECOMMENDED IMPLEMENTATION ACTIVITIES

There are a number of activities which Landfill & Ecology Corps should pursue to move toward implementation of the project. Many of these relate to conformance with Federal, State and Local rules and regulations, plans, and policies. An expanded discussion of these is given in Appendix C. The site permitting, plan conformance, and environmental assessment (EIR) activities should be started by Landfill & Ecology Corps as soon as possible. Based on the history of other similar projects, a time frame of 1-2 years or longer may be needed, although the process could be completed within 12 months if it is not publicaly or politically sensitive or controversial. The following is a list of these technical activities:

- Apply to the Los Angeles County Zoning Board to obtain adequate zoning for the site, and request a General Plan modification, if needed. This request would trigger the need for an environmental impact report. The Los Angeles County Department of Regional Planning would be designated as lead agency for the preparation of the EIR. However, the EIR document would be prepared under the direction of the applicant.

- Prepare the EIR. Cooper Engineers has submitted a proposal to prepare the EIR, conduct specific engineering and environmental studies necessary to the EIR, prepare detailed site engineering, development, operation, and closure plans, and assist in the permit procurement process.

- Request a Conditional Use Permit (CUP) from the Los Angeles County Department of Regional Planning. The application should be submitted fairly early so that sufficient time will be available for the reviewing agency to assure that the application is complete, and be able to request additional information if needed. The permit, however, canot be issued until the EIR has been completed and certified.

- Apply to the Los Angeles County Solid Waste Committee for a County Solid Waste Management Plan Conformance Finding.

- Prepare engineering documents to support preparation of the EIR and permit applications:

  - Complete geotechnical and groundwater investigation.
  - Detailed project description.
  - Detailed Site Engineering Report.
  - Site Operations Report.
  - Site Closure and Post-Closure Maintenance Report.

In addition to these technical activities, Landfill & Ecology Corps should be actively soliciting agreements with waste haulers to confirm an adequate waste supply for the landfill. Also, lining up public and political support for the project would greatly enhance its ability to be permitted.

APPENDIX A

PRELIMINARY GEOTECHNICAL/GEOLOGICAL AND HYDROGEOLOGICAL INVESTIGATION

APPENDIX A

PRELIMINARY GEOTECHNICAL/GEOLOGICAL AND HYDROGEOLOGICAL INVESTIGATION

The objective of Cooper Engineer's services was to review the geotechnical, geological and hydrological factors associated with the proposed site and determine whether any of these factors provide technical constrains which would prevent the site from being developed as a landfill. Specially, the scope of our services included in the following:

1. Research available published geologic data.

2. Perform a geologic reconnaissance and preliminary mapping of the site.

3. Explore subsurface conditions by excavating five test pits.

4. Perform laboratory testing to evaluate the physical and engineering properties of the subsurface soils.

5. Perform appropriate engineering analyses to evaluate the general suitability of the site for refuse disposal purposes.

DATA REVIEW, FIELD EXPLORATION AND LABORATORY TESTING

To accomplish the objectives of our investigation, we compiled and reviewed available, pertinent geotechnical, geologic, hydrologic and hydrogeologic information for the site. The data reviewed included logs of borings and drilled piers for the Victorville-Renaldi 500 KV transmission line No. 1 from Los Angeles County Department of Water & Power, logs of borings for adjoining freeways from CalTrans, and soils, geologic and groundwater information published by State and Federal agencies such as California Division of Mines and Geology and U.S. Geological Survey.

The subsurface conditions in a portion of the site were explored by excavating five test pits to depths ranging from 8 to 14 feet, at the locations shown on the Geologic Map Plate __. A detailed description of the field exploration is presented in the Appendix to this report. The results of the laboratory testing, which included moisture content, dry density, grain size, compaction and permeability tests, are also presented in the Appendix.

INTERPRETATION OF GEOTECHNICAL CONDITIONS

REGIONAL GEOLOGY

The Elsmere Canyon Site is located near the center of the Transverse Range Geomorphic Province. In general, the Province is characterized by very complex geologic relationships and, as the name implies, an east-west structural grain which lies transverse to the northwest-southeast grain characteristic of much of Southern California. Rocks exposed throughout the province include a wide variety of sedimentary, igneous and metamorphic types which vary in age from Precambrian to Quarternary (see Figure __, Geologic Time Scale). Sedimentary rocks are predominant in the western part of the province while metamorphic and igneous rocks are more common in the eastern part. The boundary between the two terrains lies just east of the Elsmere Canyon site. Similarly, topography in the west is controlled by folding with some secondary compressional faulting, while in the east, tensional block faulting with some compressional faulting controls. In the west, the roughly parallel, east-west trending ridge and valley system mirrors the underlying folding with anticlinal ridges and synclinal valleys.

The Elsmere Canyon site is at the west end of the San Gabriel Mountains, just east of San Fernando Pass. The pass forms the geographic boundary between the San Gabriel and the Santa Susana Mountains to the west which are considered part of the Ventura Depostional Basin. The Late Cenozoic age Ventura basin is an elongated, east-west trending sedimentary trough containing units of Pre-Cretaceous basement complex overlain by a thick sequence of Tertiary to Quaternary marine and non-marine sedimentary rocks. According to Miller,* the basement complex is composed of an older metamorphic assemblage which has been intruded by younger plutonic rocks ranging from granite to quartz diorite. This basement complex outcrops in and, in fact, underlies much of the San Gabriel Mountains which lie east of the basin. Although San Fernando Pass forms the geographic boundary between the sedimentary Santa Susana Mountains and the igneous and metamorphic San Gabriel Mountains, the geologic boundary actually lies about a mile east of the pass. The sedimentary rocks overlap the basement complex at the western end of the San Gabriels. Mapping compiled by Winterer and Durham* has divided the

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* Miller, W.J., 1983, Geology of the Western San Gabriel Mountains of California, UCLA Pub. in Mathematics and Physical Science, Pages 1-114.

Tertiary sedimentary rocks into several distinct formations. From oldest to youngest, these are an unnamed Eocene age formation, and the Tertiary age Mint Canyon, Modelo, Towsley and Pico formations and the Sunshine Ranch member of the Saugus formation. These formations are chiefly comprised of interfingering layers of sandstone, siltstone and conglomerate with characteristic abrupt lateral gradation between marine and non-marine beds.

SITE GEOLOGY

As shown on Plate __, Geologic Map, the proposed Elsmere Canyon landfill site is almost entirely underlain by Tertiary age sedimentary rocks. Only the extreme northeast corner of the site is underlain by Miller's basement complex granitic intrusives. The sedimentary rocks underlying the site consist of the Pico and Towsley formations and an unnamed group of Eocene age siltstones, sandstones and conglomerates. The Eocene rocks which outcrop in a small area within Elsmere Canyon in the center of the site are the oldest known sedimentary rocks in the region. They dominantly consist of well indurated, light to medium gray, fine to medium grained sandstone with interbedded dark siltstone and grayish-orange conglomeritic sandstone. The sandstone and conglomerate tend to be thick bedded and graded bedding is often apparent. The unit is in fault contact with the underlying crystalline basement complex and is unconformably overlain by the upper Miocene to lower Pliocene Towsley formation. To the north, in Whitney Canyon, wells in the Eocene rocks have yielded some oil and, reportedly, some of the more friable sandstone beds in Elsmere Canyon are tar saturated with occasional oil seeps along fractures.

The Towsley formation unconformably overlies Eocene rocks in the Elsmere Canyon area. It underlies much of the proposed site and, for the most part, outcrops on the interior slopes of the canyon. Generally, the formation consists of a basal conglomerate, middle sequence of poorly bedded sandstone, siltstone and mudstone with occasional conglomerate lenses and an upper massive, sandy siltstone. The basal conglomerate is about 15 feet thick, well indurated, light colored and contains angular blocks of basement complex rocks, as well as, well rounded clasts of other rock types. The middle unit is about 150 feet thick, moderately indurated, light colored and fossiliferous. The sandstone layers often contain highly fossiliferous concretions and the entire sequence is reportedly tar stained and has oil seeps. The upper sandy siltstone is about 150 feet thick, moderately indurated, yellow-brown in color and massively bedded.

* Winterer, E.L. and Durham, D.L., 1962, Geology of Southeastern Ventura Basin, Los Angeles County, California, USGS Professional Paper 334-H.

The Pliocene Pico formation unconformably overlays the Towsley formation and outcrops in the northwest corner of the site. It consists of moderately indurated, cream colored to yellow-brown, coarse grained sandstone and light brown conglomerate. Both have lenticular bedding and are conspicuously cross-stratified. The conglomeratic beds in the lower part of the formation are tar soaked.

GEOLOGIC STRUCTURE AND SEISMICITY

All of the sedimentary units in the Elsmere Canyon area have a regional dip to the west of about 35 degrees. However, regional faulting has impressed gentle, westward plunging folds on the regional structure. Within the site area, the folding has produced an anticlinal structure whose axis trends roughly northwesterly through the site. In the southern portion of the site this has resulted in a relatively uniform inclination of the sediments to the southwest with dips of about 20 to 55 degrees and strikes roughly north 45 degrees west. The dip slope condition produced by these bedding attitudes has likely contributed to the development of the widespread landsliding in the Towsley formation south of Fremont Peak. In the northern portion of the site several smaller folds appear to have been impressed on the anticline producing numerous reversals of dip direction.

In addition to the folding, faulting has stratigraphically displaced the rocks within the site area. Vertical movement of the Whitney Canyon Fault, which trends in a north-south direction through the eastern portion of the site, has elevated units to the west of the fault. The Eocene rocks which outcrop in the center portion of the site are in contact with the stratigraphically higher Towsley rocks to the east along the fault trace.

Seismically, there are no known active faults through or immediately adjacent to the site. The San Fernando Fault Zone is located about one mile south of the site. Ground rupture occurred along this zone during the magnitude 6.4 earthquake of February 1971. Maximum horizontal ground accelerations in the vicinity of the fault averaged about 0.5g. However, at Pacoima Dam, southeast of the site, recorded accelerations exceeded 1.0g. The Santa Susana Fault is a westward continuation of the San Fernando Fault zone and is considered to be potentially active in the vicinity of the site based on its association with The San Fernando Fault. The San Gabriel Fault is located about 2½ miles northeast of the site. Although there is no known geologic evidence of activity, the San Gabriel Fault is considered potentially active based on its association with the San

Andreas Fault. Correlation of displaced rocks suggest that the San Gabriel Fault has had about 35 miles of post Miocene right-lateral offset. It is believed capable of generating a magnitude 7.2 earthquake. The active San Andreas Fault is located about 21 miles to the northeast. On the basis of its proximity to known active and potentially active faults, it can be anticipated that the site will be subjected to strong groundshaking during its useful life.

GROUNDWATER CONDITIONS

The rocks underlying the proposed site and its vicinity are considered to be part of non-water bearing rock series of the Santa Susana and San Gabriel Mountains. They are, for the most part, relatively impervious and therfore, store comparatively little water. Water yield to wells drilled in these sediments is very low. As would be suggested by the tar and oil content of the rocks, the quality of the water found is generally unsuitable for most beneficial uses. There are no known wells in or adjacent to the proposed site.

SOIL CONDITIONS

Soil conditions at the site consist of a mixture of residual and colluvial types. The residual soils are, for the most part, confined to the ridgelines and immediately adjacent sideslopes. They are derived from the weathering of the directly underlying rock materials. Colluvial soils mantle virtually all of the site sideslopes and were derived from the weathering of rock materials farther upslope and transported by gravity to their present position.

The test pits indicated the near-surface soils to consist of brown to dark brown, medium stiff to stiff, clayey silts with traces of sand and gravel. Thicknesses of this layer ranged from about 2½ feet up to greater than 14 feet in Test Pit No. 4, with the majority of the test pits indicating thicknesses of about 3 feet; however, thicknesses of this layer would vary across the site. Underlying this layer, to the depths explored, were brown, medium stiff silts; moderately weathered, soft, sandy siltstone; and moderately weathered, soft, sandstone.

Additional subsurface exploration should be performed to better define subsurface soil conditions.

CONCLUSIONS AND RECOMMENDATIONS

GENERAL

The conclusions and recommendations presented herein are general in nature, and are based on a brief site reconnaissance, limited subsurface exploration and on our interpretation of geotechnical conditions. The intent of the conclusions and recommendations is to provide general geotechnical information to be used for the preparation of a feasibility study of developing the subject site as a Class II-2 sanitary landfill. A more detailed investigation will be required to address specific geotechnical considerations and to provide landfill design criteria. On this basis, it is our opinion that the proposed site is geologically and geotechnically suitable for development of a Class II-2 sanitary landfill. There do not appear to be any geologic hazards which would preclude development of the site for disposal of household wastes. There are no known active faults within the site and the underlying materials do not contain significant quantities of groundwater. The groundwater that is present likely has little beneficial use due to contamination by naturally occurring deposits of tar and oil. Except for the dip-slope area south of Fremont Peak, natural slope stability appears to be relatively good. However, based upon the laboratory test results, the near surface clayey silts may not be suitable for use as final cover material. A more detailed discussion on the cover material is presented in subsequent sections.

FINAL COVER MATERIAL

In general, two types of soils considered feasible for final cover material were observed at the site; (1) near-surface clayey silts, and (2) near-surface silts. To evaluate the suitability of these soils for final cover material, laboratory permeability tests were performed on samples of these near-surface soils compacted to at least 90 percent of the maximum dry density as determined by ASTM D-1557-78 Test Procedure. For the on-site near-surface silts and clayey silts, our laboratory permeability tests indicate permeabilities on the order of 10^{-5} centimeters per second. The test results indicate permeabilities greater than the State's minimum requirement of 1×10^{-6} centimeters per second. Thus, at this time, it appears that import fill material will be required for final cover. Any import material considered should be free of vegetation, predominanty fine grained and should have a permeability of less than 10^{-6} centimeters per second.

Our opinions regarding final cover material are based upon our preliminary geotechnical investigation and laboratory permeability tests. Further detailed site investigations and a laboratory testing program will be required to determined if other on-site materials,

not encountered by our subsurface investigation, will be suitable for final cover material, or if an engineered material consisting of a mixture of import and on-site soils meeting the State's permeability requirements can be developed.

CUT SLOPE CONSIDERATIONS

Development of the landfill will necessitate the construction of short-term slopes during cut and fill operations. Geotechnical considerations include short-term stability, allowable slope ratios and maximum allowable slope heights. Specific cut slope design recommendations will require engineering analyses for various site operating conditions based on laboratory strength test data from relatively undisturbed soil and rock samples. Based upon our preliminary review of the existing site conditions and the performance of existing roadway cuts at the site, temporary cut slopes of up to 20 feet in height, excavated at slopes no steeper than 1½:1 (horizontal to vertical) should be considered feasible. Sloughing, ravelling and erosion of cut slopes should be anticipated.

SITE PREPARATION

All vegetation in portions of the site to be excavated should be cleared. To minimize surface erosion, cleaning should be performed in stages as the landfill is expanded across the site. Unsuitable material should be removed and all near-surface clayey or silty soils should be stockpiled as cover material.

For normal operating procedures, most of the excavated on-site clayey silts or silty soils should be suitable for daily cover. Additionally, it appears that much of the near-surface, weathered rock would be suitable for daily cover. Some of the harder standstone concretions in the Pico formation and the more highly indurated Eocene rocks may not be suitable.

Our brief field reconnaissance and the test pit excavations, suggest that most site materials can be excavated to moderate depths with conventional grading equipment. Some heavy ripping or light blasting may be necessary in highly cemented sandstones or conglomerates.

SURFACE DRAINAGE CONSIDERATIONS

Development of the landfill may produce a short-term increase in erosion rates. Much of the increase would result from the alteration of surface drainage patterns and the removal of protective vegetation and humus layers.

Consideration should be given to excavation and operation procedures that will minimize impact due to erosion, such as to limit sheet and rill erosion of cut slopes and to minimize sloughing of cut slopes. In addition, a comprehensive revegetation program will need to be developed for planting of the site following closure of the landfill.

APPENDIX B

FIELD EXPLORATION AND LABORATORY TESTING

APPENDIX B
FIELD EXPLORATION AND LABORATORY TESTING

FIELD EXPLORATION

The subsurface conditions of a portion of the site was explored by excavating of five test pits to depths ranging from 8 to about 14 feet. The field exploration was conducted on December 20, 1983.

The log of test pits,prepared from the field data, together with the field notes, and some laboratory test results, are presented on Plate A-1A through Plate A-1C. An explanation of the nomenclature used on the test pit logs is shown on Plate A-2, Method of Soil Classification and Plate A-3, Description of Rock Properties.

The test pits were excavated with a backhoe under the technical direction of one of our engineering geologists, who examined and visually classified the soils and rock encountered, maintained a continuous log of the surface and subsurface conditions encountered, and assisted in obtaining disturbed and relatively undisturbed soil and rock samples for further examination and testing. Relatively undisturbed samples of soils were recovered using a 3-inch-diameter thin wall sample tube, driven by a Corps of Engineers Surface Soil Sampler, following ASTM D-2937 Procedure.

LABORATORY TESTING

All soil and rock samples recovered during the field exploration program were visually examined and classified in our laboratory, and laboratory tests were performed on selected, representative soil samples. The laboratory testing program was designed to provide data for the general evaluation of the physical properties and engineering characteristics of the subsurface soils at the site. The types of tests performed are described in the following paragraphs.

Classification Tests

Moisture and Density. Moisture contents and dry densities were determined on selected relatively undisturbed soil samples. The tests were performed in accordance with ASTM Test Designation D-2166. Test results are tabulated on the test pit logs adjacent to the appropriate samples.

Atterberg Limits. As an aid in classifying the near-surface soils considered possibly

suitable for cover material, the liquid limits were determined for selected samples. The tests were performed in accordance with ASTM Test Designations D-423 and D-424 on composite samples. The results are tabulated below:

Test Pit No.	Material	Unified Soil Classification System Designation	Liquid Limit	Plasticity Index
1, 2 & 4 At depths of 0 to 3 feet	Near-Surface Clayey Silt	CL/ML	39	13
2 & 3 At depths of 6 to 8 feet	Near-Surface Silts	ML	38	4

Grain Size Analysis. To provide information on particle size, and as an aid in classification, a sieve analysis and hydrometer test was performed on a composite sample of sandy silts obtained from Test Pits 2 and 3 at 6 to 8 feet deep. The results are shown on Plate A-__, Gradation Test Data.

Compaction Tests

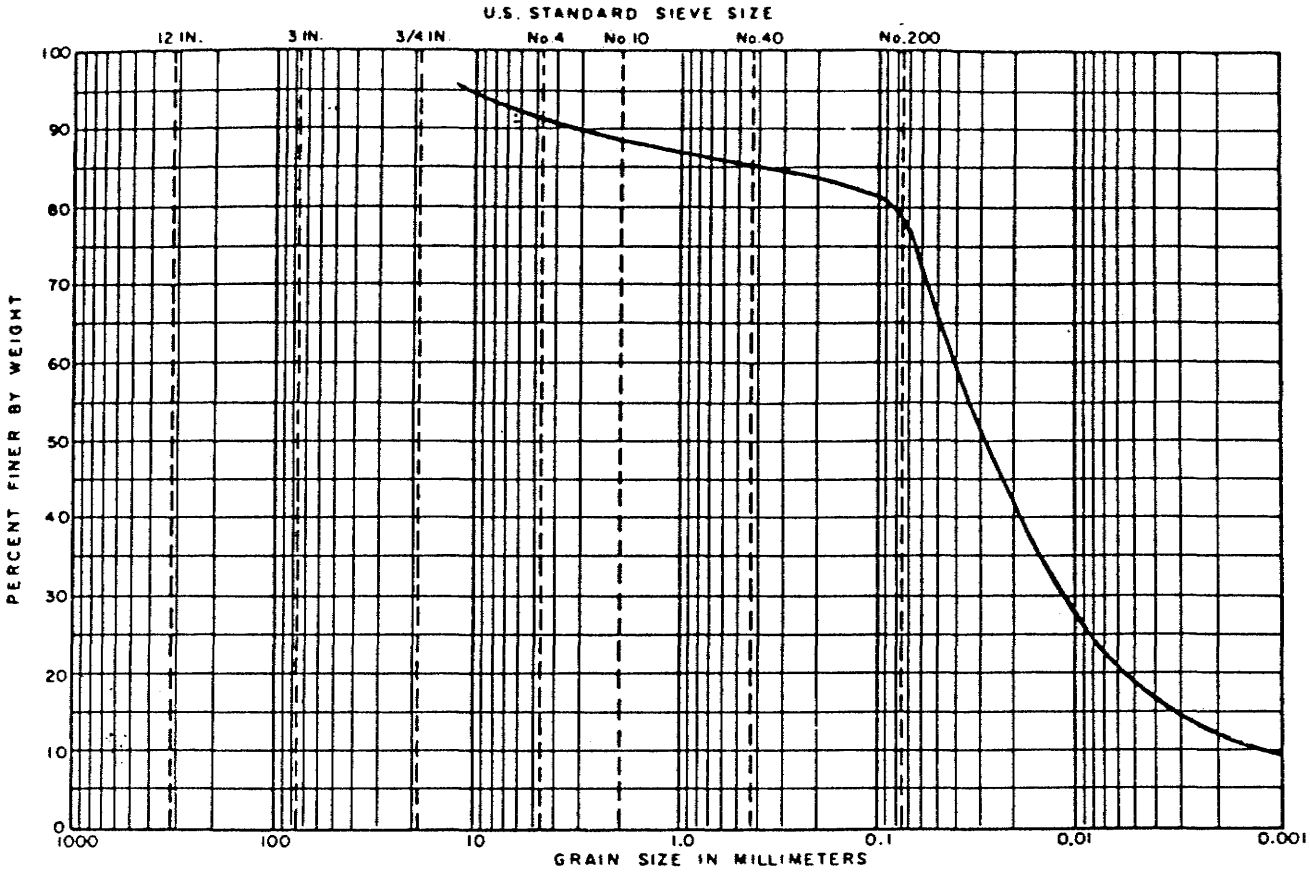
Compaction tests were performed on composite samples using ASTM D-1557-78 Test Procedure. One sample consisted of near-surface clayey silts from Test Pits 1, 2 and 4 (0 to 3 feet deep) and the other consisted of deeper sandy silts from Test Pits 2 and 3 (6 to 8 feet deep). The results are presented on Plate __, Compaction Test Data.

Permeability Tests

Laboratory permeability tests were performed to estimate the permeabilities of the near-surface clayey and sandy silts which appeared possibly suitable for use as cover material. Constant head permeability tests were performed on two remoulded samples. In the test, samples are saturated and consolidated under confining stresses equivalent to the existing overburden stresses. After consolidation, a constant differential backpressure head is applied axially across the samples with the corresponding flow through the sample being recorded. Permeabilities of the samples are determined from these flowrates. The test results, corrected to 20°C, are tabulated below:

Test Pit Number	Depth (Feet)	Soil Type	Initial Moisture Content (%)	Initial Dry Density (pcf)	Confining Stress (psf)	Permeability (cm/sec)
Remoulded Sample*						
1, 2, 4	0-3	CL/ML	15	100	200	1.2×10^{-5}
1, 2, 4	0-3	CL/ML	14	99	400	2.7×10^{-5}
2 & 3	6-8	ML	17	98	200	1.5×10^{-5}
2 & 3	6-8	ML	18	98	400	1.4×10^{-5}

* Sample compacted to at least 90 percent of the maximum dry density as determined by ASTM D-1557-78 Test Procedure.



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

(UNIFIED SOIL CLASSIFICATION SYSTEM)

LEGEND	———		
BORING NUMBER	Combined samples TP-2 and TP-3		
DEPTH (FEET)	6 – 8		
SOIL DESCRIPTION	ML		
EFFECTIVE SIZE, D_{10}			
COEFFICIENT OF UNIFORMITY D_{60}/D_{10}			
COEFFICIENT OF CURVATURE $D_{30}^2/(D_{10} * D_{60})$			

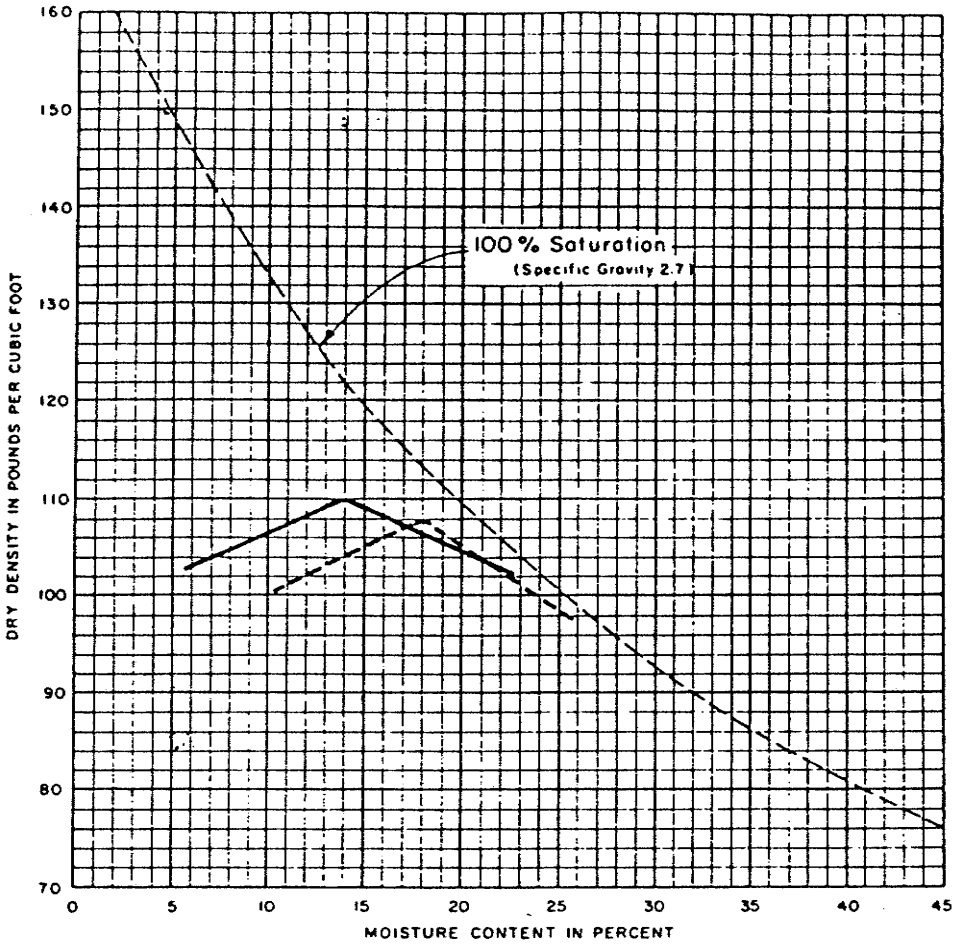
LOCATION Newhall, California

GRADATION TEST DATA

Cooper Engineers

Job Number 2727-A Client Landfill and Ecology Corp.
Location Newhall, California
Cross Reference Job Number

Drawn By CJ Date 1/17/84
Checked By Date



COMPACTION METHOD:

- ☐ ASTM D 698 (OR AASHO T 99)
- ☐ ASTM D 1557 (OR AASHO T 180)
- ☐ CALIF. 216
- ☐ OTHER _____

LEGEND	———	- - - - - - - - - -	
BORING or SAMPLE NUMBER	Combined samples TP-1, TP-2, TP-4	Combined samples TP-2, TP-3	
DEPTH (FEET)	0 – 3	6 – 8	
SOIL DESCRIPTION	ML/CL	ML	
SOURCE OF MATERIAL	On-site	On-site	
USE OF MATERIAL			

OPTIMUM MOISTURE CONTENT (%)	14	18	
MAXIMUM DRY DENSITY (PCF)	110	108	

COMPACTION TEST DATA

Cooper Engineers

APPENDIX C
CONFORMANCE WITH PLANS, ORDINANCES AND POLICIES

APPENDIX C
CONFORMANCE WITH PLANS, ORDINANCES AND POLICIES

A complex set of regulations and standards govern the disposal of solid wastes. These regulations are administered by local, county, state, and federal agencies. Many of the regulations contain monitoring and reporting requirements for the purpose of assuring compliance with standards. The purpose of this section is to describe standards which would be applicable to the proposed Elsmere Canyon Landfill project and to describe some of the anticipated monitoring requirements. Each of the permitting agencies will specify requirements as conditions of granting permits.

FEDERAL

1. Solid Waste Disposal Act/Federal Resource Conservation and Recovery Act (RCRA)

   The Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA) of 1976, provided the guidelines by which California developed its solid waste and resource recovery management plan.

   In general, the objectives behind RCRA are to encourage "methods for the disposal of solid waste which are environmentally sound, to maximize the utilization of valuable resources, and to encourage resource conservation" (Metry, The Handbook of Hazardous Waste Management, 1980). The guidelines presented in the act consider numerous aspects of solid waste disposal including:

   - Practices which protect ground and surface water quality from leachate,
   - Protection of air quality,
   - Appropriate means of resource recovery and conservation, and
   - Markets for recovered material.

The Acts do not provide for direct federal enforcement of the State Solid Waste Management Plan, but the Environmental Protection Agency (EPA) can sue to stop any handling of solid waste which presents "imminent and substantial" hazards to public or environmental health. Officially California has not been delegated authority over solid waste matters, but in practice the EPA allows the State to manage its own affairs in this area and would step in only if it felt that the State was not doing an adequate job.

2. Endangered Species Act

The Endangered Species Act (ESA) of 1973, as amended, provides for the protection of certain species of fish, wildlife and plants which are in danger of extinction because of either direct taking of the species or depletion of their habitat. Should such a species be threatened by a project the Act requires certain studies be completed to assess the impacts and possible mitigating measures.

STATE

1. California Waste Management Board (CWMB)

The CWMB is required by state law to take two actions relative to a solid waste facility before it operates. The first action is to find conformance with the CoSWMP as recommended by the local solid waste planning entity, in this case the Los Angeles County Solid Waste Management Committee. Once the CoSWMP is approved by the CWMB it is considered to be consistent with the Board's adopted policies.

The CWMB must also review a solid waste facilities permit for the solid waste facility and concur with or reject it. This permit is issued by the Los Angeles County Department of Health Services. The permit requirements are covered more fully in the discussion of the County Department of Health Services.

2. Regional Water Quality Control Board - Los Angeles Region

The Regional Water Quality Control Board (RWQCB) is the state agency charged with ensuring that groundwater supplies remain uncontaminated and safe for human consumption. The design and siting of landfills is regulated by RWQCB because of the potential for leachate to contaminate underground water sources.

The regulations outlined below governing waste disposal to landfill are those in effect at this time. However, the State Water Resources Control Board is now in the process of revising these regulations to conform to the standards mandated by EPA. This revision should be completed during 1984.

Current Disposal Site Classification

- Class I sites must provide maximum protection of ground and surface water (as well as of public health and wildlife resources) from all wastes deposited at the site. These sites can handle all wastes, including Group 1 wastes (those which contain toxic substances and substances which could significantly impair the quality of usable water).

- Class II-1 sites overlie usable groundwater but have the capability (through either natural or artificial means) of preventing lateral and vertical continuity between liquids and gases emanating from the site and usable surface or groundwater. These sites can accept Group 2 wastes (decomposable material which does not contain toxic substances nor substances capable of significantly impairing the quality of usable waters, including municipal solid waste) and Group 3 wastes (non-water-soluble, non-decomposable inert solids). With the approval of the Regional Water Quality Control Board, the sites can accept certain Group 1 wastes.

- Class II-2 sites have vertical and lateral hydraulic continuity with usable groundwater but also have features (either natural or artificial) which assure protection of the quality of usable groundwater underneath or adjacent to the site. These sites can accept Group 2 and Group 3 wastes. The existing Sunshine Canyon Landfill is a Class II-2 site.

- Class III sites provide protection to water quality from Group 3 wastes by preventing erosion of deposited material.

These regulations allow the disposal of municipal solid waste at Class II-2 sites such as the proposed Elsmere Canyon.

The proposed regulations would revise this classification system by allowing the State Water Resources Control Board (again, through the Regional Boards) to classify disposal sites as follows:

Proposed Disposal Site Classifications

- Class I sites have natural geologic barriers capable of preventing vertical movement of waste to waters of the state, and have natural or artificial barriers capable of preventing lateral waste movement to waters of the state. These sites can accept all types of waste, including hazardous waste, as classified by the Department of Health Services.

- Class II sites have natural or artificial barriers which provide isolation for "designated waste". "Designated wastes" are either a) wastes which could cause degradation of waters of the state but do not contain toxic or hazardous constituents in excess of certain specified concentrations, or b) hazardous wastes which have been granted a variance from the Group 1 waste requirements by the Department of Health Services.

- Class III sites provide adequate separation between refuse and waters of the state. Refuse includes non-hazardous municipal or domestic solid waste.

The proposed Elsmere Canyon Landfill would be classified as a Class III site under these new regulations and could accept municipal solid waste. In general, incinerator ash will also be acceptable for disposal at Class III sites, unless the Department of Health Services determines that a specific type of ash is hazardous. It is expected that ash from the incineration of municipal solid waste will not be classified as hazardous and will thus be allowed for disposal at Class III sites (Gil Torres, State Water Resources Control Board, pers. comm.).

3. California Department of Fish and Game

The California Department of Fish and Game (CDFG) takes interest in any project which may impact wildlife or wildlife habitat, especially waterways. Typically CDFG requires permits for operations such as the Elsmere Canyon Landfill if any activity is expected to occur in a waterway. Landfill & Ecology Corps would be required to obtain an agreement from the CDFG to fill any stream area, including intermittent streams.

4. California Department of Conservation, Division of Forestry

The Elsmere Canyon Landfill will not have an impact on California Division of Forestry (CDF) operations or responsibilities, but the site is subject to California Forest and Fire Laws, Public Resources Code Sections 4291, 4374, 4375, 4427, 4431, 4117, and 4442.

These codes specify equipment required on site and regulations for equipment use which minimize the chances of operation-related fires. Section 4374 requires a firebreak of a minimum of 150 feet around the landfill and a firebreak of a minimum of 100 feet around structures within 150 feet of the periphery of the landfill.

5. California Department of Health Services

The Department of Health Services (DOHS) may submit comments on the EIR but would not require a permit for the Elsmere Canyon Landfill unless hazardous wastes were going to be accepted there. If that were the case, the landfill operator would have to obtain a Hazardous Waste Disposal Facility Permit from DOHS prior to operation, and possibly a permit from the EPA if the waste was regulated under RCRA as a hazardous waste.

The DOHS also oversees the health related standards required of the landfill operator, such as vector and odor control. DOHS will be in consultation with the County of Los Angeles Department of Health Services regarding enforcement of the standards.

6. California Department of Transportation (Caltrans)

As part of its responsibility for highway maintenance, Caltrans requires an Encroachment Permit for any development activity proposed to occur within the right-of-way of the highway. The Caltrans office in Los Angeles will review the EIR and determine if the project requires such a permit.

LOCAL AND REGIONAL

1. Zoning Change and General Plan Consistency

An application must be made to the Los Angeles County Zoning Board to obtain adequate zoning for the site. This request would be in conjunction with a request for a change in the General Plan to allow the landfill use and designate the landfill on the plan. This request would trigger the need for an environmental assessment, in all likelihood an EIR. The LA County Department of Regional Planning would be designated as lead agency for the preparation of an EIR. The EIR itself would be prepared by the applicant.

2. Land Use Permit

The land use permit necessary for the development of the Elsmere Canyon Landfill is a Conditional Use Permit (CUP) that would be issued by the Los Angeles County Department of Regional Planning. The process by which a CUP is obtained commences with the submission of an application which includes the Final EIR and detailed maps showing the location and a plot plan of the proposed project. The application will include a discussion of how the

requested use at the proposed project site will or will not a) adversely affect the health, peace, comfort, or welfare of persons residing or working in the surrounding area, b) be materially detrimental to the use, enjoyment, or valuation of property of other persons located in the vicinity of the site and c) jeopardize, endanger, or otherwise constitute a menace to the public health, safety or general welfare. Additionally, the following will need to be substantiated to the satisfaction of the Zoning Board and Planning Commission: 1) that the proposed site is adequate in size and shape to accommodate all development features described in the Conditional Use Permit Case-Burden of Proof Ordinance, or as otherwise required in order to mitigate said use with the uses of the surrounding area, and 2) that the proposed site is adequately served by streets or highways and by other public or private service facilities as required. The Regional Planning staff will review the application package and set a date for a public hearing by the Zoning Board. After the public hearing, the Zoning Board will submit its recommendations to the Regional Planning Commission. If the Zoning Board approves the CUP, specific conditions will be included in the approval. The Planning Commission will review the Zoning Board recommendations and accept, reject, or modify the conditions. The Planning Commission decision can then be appealed to the County Board of Supervisors which may approve or deny the project, refer the case back to the Regional Planning Commission, or hold a new hearing. Throughout this process, public hearings will be held and conditions to which the project must adhere would be set.

3. Air Quality Permit

The South Coast Air Quality Management District (SCAQMD) is responsible for implementing local air quality controls and issuing permits for modified sources and for new sources of air pollution. The Elsmere Canyon Landfill falls under the jurisdiction of the SCAQMD, and the landfill would need an air quality permit. Burning is not planned as part of the landfill operation.

4. County of Los Angeles Department of Health Services

New solid waste handling and disposal facilities are required to obtain a Solid Waste Facilities Permit to ensure that they are designed and operated with adequate protection of public health and safety. The permit is concurred in by the CWMB, but is written and issued by the local enforcement agency (LEA). The LEA in Los Angeles is the County Department of Health Services.

It is the responsibility of the LEA to ensure that a solid waste facility adheres to the conditions of its operating permit. This is normally accomplished through periodic inspections, collection of monthly reports detailing the types and quantities of wastes disposed of, and in the case of landfills, quarterly chemical analyses of monitoring-well samples.

5. Los Angeles County Solid Waste Committee

The Los Angeles County Solid Waste Committee is responsible for the preparation and updating of the CoSWMP. The committee also recommends to the CWMB whether a proposed facility conforms to the plan. In order for a landfill project to conform to the CoSWMP, the plan must be amended to specifically identify the project and its sources of refuse. The Elsmere Canyon facility is included in the CoSWMP, but additional information will have to be before Finding of Conformance is issued.

The various permits and approvals necessary for the project are listed on Table 6. Although a time frame for each permit is listed, many of the activities can be conducted concurrently. It should take about 1-2 years to complete these activities, although longer time frames have been the rule for controversial projects.