2. PROJECT DESCRIPTION

A. DESCRIPTION OF EXISTING FACILITIES

The Union Mine Disposal Site is a Class III municipal solid waste landfill; the landfill has been developed using both the area fill and canyon fill methods. Landfill development began in 1969 by placing refuse at the toe of the canyon in 15-foot-thick refuse lifts and extending the refuse lifts toward drainage courses and gullies. Setbacks were provided for the natural drainage of surface water runoff. The active working face of the landfill (where refuse is placed and compacted before being covered with soil) occupies approximately 10,000 square feet.

In 1990 the landfill received an estimated 312,000 cubic yards at the gate or approximately 108,000 tons of nonhazardous solid wastes generated from within the West Slope Waste Management Area of El Dorado County. The existing landfill extends above the natural topography of the canyon and covers an approximate area of 33 acres. The landfill is unlined and constructed over native materials. The county has estimated that the existing landfill area has an estimated refuse capacity of 3.1 million cubic yards, and as of 1991, approximately 1.1 million cubic yards of capacity remains (which equates to approximately 5 years of service life at present disposal rates).

Fees and tonnage estimates for incoming refuse are calculated from vehicle dimensions. The landfill currently does not have scales to measure the weight of incoming refuse, although scales are planned to be installed by September 1991. The incoming refuse is placed on the working face and is then spread and compacted. A series of passes by landfill equipment (Caterpillar bulldozers) compacts the refuse prior to placement of a soil cover. Soil covers are used to control odors, litter, vectors, and reduce leachate generation. The soil cover consists of clean soil excavated from an onsite source. A minimum of 6 inches of compacted daily soil cover is placed on the side slopes of the advancing refuse fill at the end of each day's activities. A minimum of 12 inches of intermediate soil cover is placed on the top surface of the refuse fill every day.

Waste is brought to the Union Mine Disposal Site by residential self-haul, residential/commercial waste haulers, and industrial/construction waste haulers.

Residential/commercial waste hauling companies collect the majority of the waste disposed of at the Union Mine Disposal Site.

The landfill is open to the public and operates 359 days a year from 8:00 a.m. to 5:00 p.m. during Pacific standard time and until 6:00 p.m. during Pacific daylight savings time. Access to the landfill is provided by Union Mine Road from Highway 49. Union Mine Road is a paved, two-lane public road maintained by the county. It is estimated that there are an average of 145 vehicles which travel to the landfill each day to dispose of refuse, 60 of which are commercial refuse hauling trucks.

Personnel

Ten full-time employees currently staff the waste disposal and landfilling operations at the Union Mine Disposal site. These include:

1 Lead Equipment Operator
4 General Equipment Operators
1 Relief Equipment Operator
1 Spotter/Traffic Control/Load Screening Specialist
1 Litter Picker
2 Gatekeepers/Load Screening Specialists

In addition to the waste disposal crew there are two clerks who run the Recycling/Buy Back Center, and one foreman/crew supervisor and five pickers/ laborers who operate the salvage operations at the landfill.

Equipment

The following heavy equipment (all operate on diesel fuel) is utilized for daily landfilling operations at the site:

- 1 Caterpillar D8 Bulldozer
- 2 Caterpillar Compactors
  80,000 lb. primary use
  40,000 lb.back up

- 2 14-yard capacity scrapers
  - 1 backup
  - 1 primary
- 2 water trucks
  - 4000 gallon capacity primary
  - 2000 gallon capacity backup
- 1 Caterpillar road grader

In addition, the salvaging operations utilize:

- 2 three-quarter ton pickup trucks (gasoline)
- 1 tractor

Waste Characterization for the County of El Dorado

The following information concerning El Dorado County's waste characterization was obtained from the County's Solid Waste Management Plan (1989). El Dorado County is generally rural, with only two incorporated cities. The primary industries in the county include timber production, light manufacturing, and tourism. Specific wastes generated in El Dorado County in 1989 included:

- municipal solid waste (including institutional, commercial, and residential wastes)
- sewage sludge
- ash
- construction and demolition wastes
- grease trap wastes
- hazardous wastes

The county currently has a load screening program in place at the landfill to prevent hazardous materials from entering the landfill. The load screening program is discussed further below, under Environmental Monitoring Program.

In January 1991, CH_2M HILL completed a waste characterization report for the West Slope Waste Management Area of El Dorado County. As part of this report, an analysis of the wastes accepted at the Union Mine Landfill was conducted.

Figure 2-1 shows the characterization of the waste accepted at the Union Mine Disposal Site during the week of May 19 to May 25, 1990. Table 2-1 identifies each type of waste and its percent of the total waste stream.

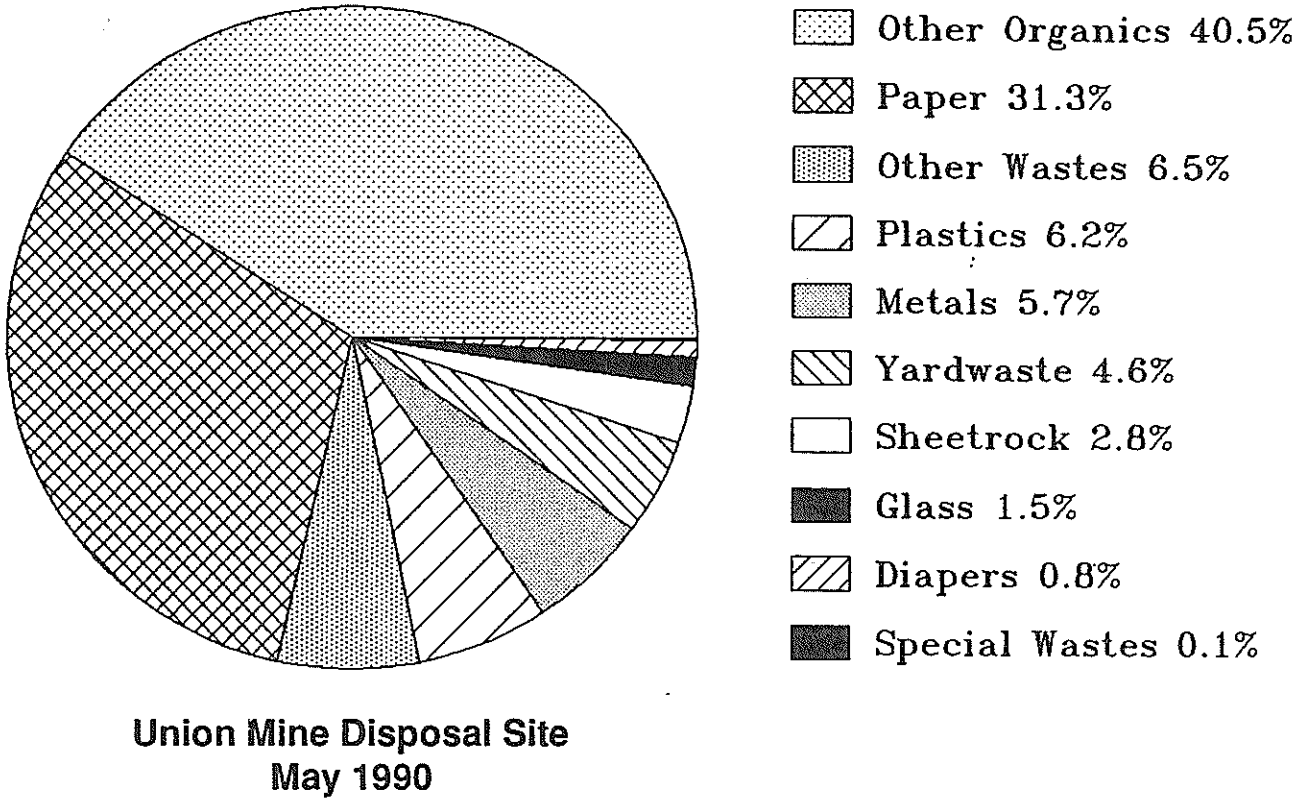
Recycling Program

A municipal waste stream contains many valuable resources such as paper, metals, glass, plastic, yard wastes, and oil that can be recovered and recycled. In El Dorado County, an estimated 17 percent of the total waste generated county-wide annually is recycled or reused (El Dorado County 1991). This high percentage is primarily due to the wood products industry, which is the primary generator and user of recovered products. It is estimated that 99 percent of the waste generated by this industry is reused in some form or another. Municipal solid waste comprises 65 percent of the county's total waste stream. Currently only about 2 percent of the municipal solid waste stream generated in the county is recovered or reused (CoSWMP 1989).

A small recycling and salvage center is currently in operation at the disposal site. El Dorado Disposal Inc., the operators of the Union Mine Disposal Site, recovered and recycled approximately 130 tons of materials brought to the landfill in 1988. (El Dorado County 1989). This included 45 tons of glass, 35 tons of aluminum, and 50 tons of newspaper. In 1990, the recycling operations recovered more than 182 tons of aluminum, 475 tons of glass, and 14 tons of plastic through the on-site buy back center. In addition, approximately 303 tons of miscellaneous metals (aluminum, copper, brass, iron, etc.) were recovered through the active salvaging operations at the landfill.

Emergency Response Plan

An Emergency Response Plan has been developed to minimize potential hazards of events such as earthquakes, fires or rainstorms in excess of reasonable design standards, and provide a standardized procedure for handling occurrences that may endanger public health or the environment. The plan requires that in the event of a fire, explosion, release of significant amounts of waste, failure of a control system or natural disaster, facility personnel undertake the specific emergency procedures developed in the plan.



Union Mine Disposal Site
May 1990

ERCE

Summary of Waste Stream Composition West Slope Area El Dorado County

FIGURE
2-1

UNION MINE LANDFILL/EL DORADO COUNTY
(Based on Sampling during the Week of 5/19 to 5/25/90)

TOTAL OF ALL WASTE SUBPOPULATIONS	WASTE COMPOSITION			
	Percent	Category	Weight	
CIWMB Waste Types	of Total	Subtotals	(lb)	(tons)
1. Paper				
a. Corrugated Containers	12.0%		385,200	192.6
b. Mixed Paper	4.8%		154,300	77.2
c. Newspaper	4.0%		127,700	63.9
d. High Grade Ledger Paper	0.1%		3,800	1.9
e. Other Paper	10.4%	31.3%	335,300	167.7
2. Plastics				
a. High-Density Polyethylene (HDPE)	0.1%		4,400	2.2
b. Polyethylene Terephthalate (PET)	0.0%		600	0.3
c. Film Plastics	2.5%		79,900	40.0
d. Other Plastics	3.6%	6.2%	114,500	57.3
3. Glass				
a. Refillable Glass Beverage Containers	0.0%		200	0.1
b. California Redemption Value Glass	0.3%		9,900	5.0
c. Other Recyclable Glass	1.1%		34,100	17.1
d. Other Non-Recyclable Glass	0.2%	1.5%	5,500	2.8
4. Metals				
a. Aluminum Cans	0.2%		6,300	3.2
b. Bi-Metal Containers	0.0%		1,400	0.7
c. Ferrous Metals and Tin Cans	4.9%		157,100	78.6
d. Non-Ferrous Metals Incl. Aluminum Scrap	0.6%		18,400	9.2
e. White Goods	0.0%	5.7%	1,600	0.8
5. Yard Waste, Incl. Leaves, Grass and Prunings	4.6%	4.6%	147,300	73.7
6. Other Organics				
a. Food Waste	5.6%		179,200	89.6
b. Tires and Rubber Products	7.7%		248,200	124.1
c. Wood Wastes	25.2%		809,800	404.9
d. Agricultural Crop Residues	0.0%		0	0.0
e. Manure	0.0%		0	0.0
f. Textiles and Leather	2.0%	40.5%	63,800	31.9
7. Other Wastes				
a. Inert Solids, Incl. Rock, Concrete	5.1%		165,100	82.6
b. Household Hazardous Wastes	1.4%	6.5%	44,400	22.2
8. Special Wastes				
a. Ash	0.0%		0	0.0
b. Sewage Sludge	0.0%		0	0.0
c. Industrial Sludge	0.0%		0	0.0
d. Asbestos	0.0%		0	0.0
e. Auto Shredder Waste	0.0%		0	0.0
f. Auto Bodies	0.0%		0	0.0
g. Other Special Wastes	0.1%	0.1%	1,900	1.0
9. Sheetrock	2.8%	2.8%	89,300	44.7
10. Disposable Diapers	0.8%	0.8%	24,800	12.4
Total		100.0%	3,214,000	1,607

TABLE 2-1

ERCE

Summary of Waste Composition Results

A copy of the plan is provided to each of the organizations, companies, or agencies that have agreed to provide assistance in emergency situations. One copy of the plan is maintained in the landfill office onsite at all times. The Union Mine Disposal Site Emergency Response Plan is included as Appendix B. In addition, refer to Section 3.F, Hazardous Materials/Infectious Waste for additional information relating to the Emergency Response Plan.

Environmental Monitoring Program

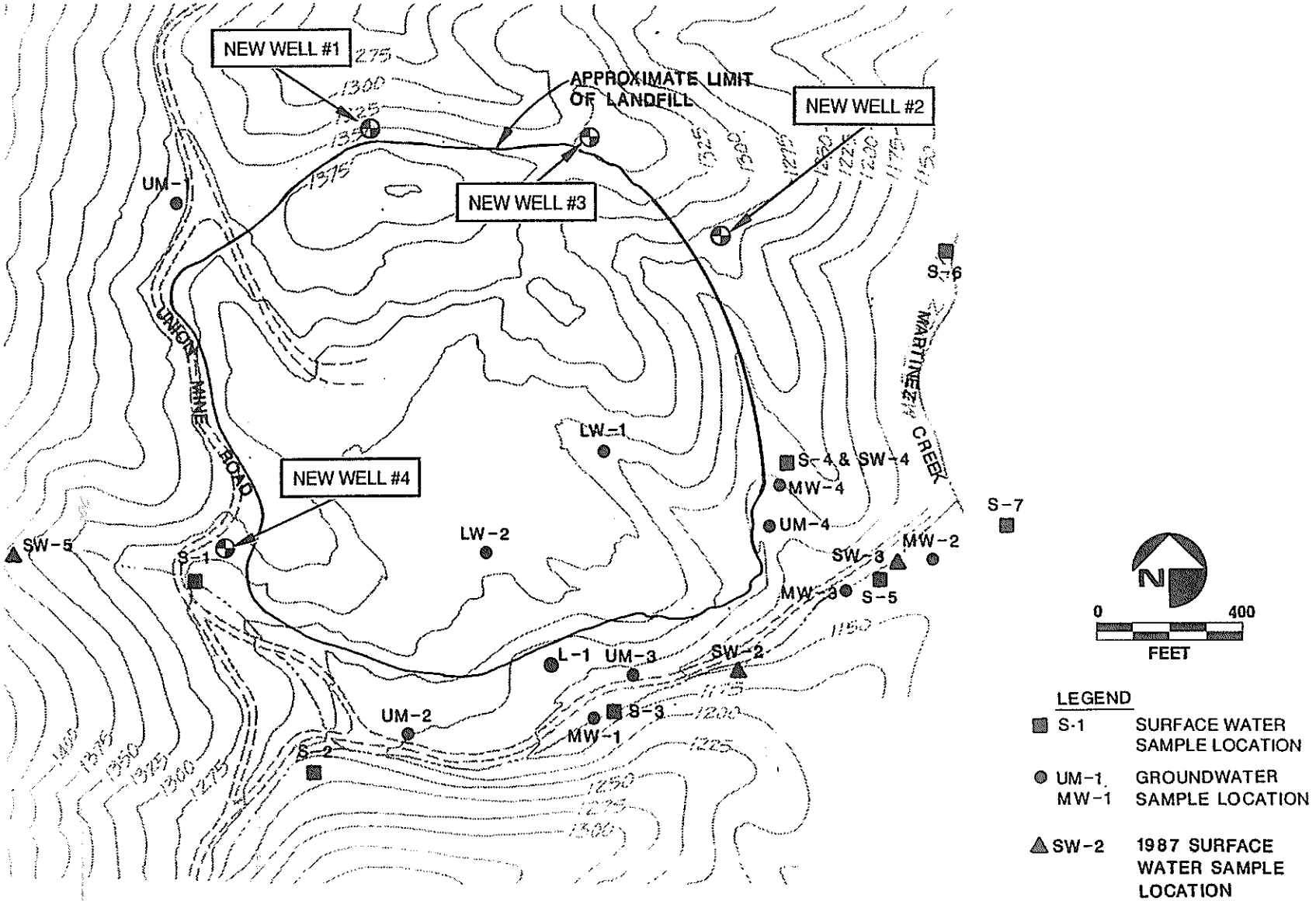
Current monitoring requirements at the Union Mine Disposal Site are specified by the RWQCB in Monitoring and Reporting Program No. 88-149 incorporated into Waste Discharge Requirements (Order 88-149). The required monitoring program includes monitoring of solid waste, leachate, surface water, groundwater, and landfill gas.

Reporting. Monitoring reports are to be submitted monthly to the RWQCB, the CIWMB, and the local enforcement agency (LEA) by the 15th day of the month following the month in which the samples were taken or as soon thereafter as practicable.

Solid Waste Monitoring. The Union Mine Disposal Site operators (EDL) estimate the quantity of waste discharged (in tons), monitor the types of waste and the source of materials, and submit this information monthly to El Dorado County (LEA) and the RWQCB.

Leachate Monitoring. Currently, leachate discharges seasonally from the landfill at several points during and after wet-weather periods as shown in Figure 1-5. Leachate generation is discussed in the *Hydrogeologic Report for Preliminary Design,* prepared by CH_2M HILL in February 1991 and on file with the county. No leachate collection or removal system is currently in place for the active landfill. Leachate currently generated by the landfill is sampled monthly, quarterly, and semi-annually for specific parameters/constituents.

Groundwater Monitoring. Ten groundwater monitoring wells have been established at the facility, as shown in Figure 2-2, and include the following:



SOURCE: CH_2M Hill 1991

ERCE

Approximate Surface Water and Groundwater Sampling Locations

FIGURE 2-2

UM-1: Upgradient well, located in fractured bedrock near northwest boundary of refuse fill area.

UM-2: Crossgradient well, located in fractured bedrock on southwest edge of refuse fill area.

UM-3: Downgradient well, located in fractured bedrock on south-southeast edge of refuse fill area.

UM-4: Downgradient well, located in fractured bedrock on east-southeast edge of refuse fill area.

MW-1: Shallow downgradient well, located in surficial deposits and shallow bedrock in drainage south of fill area.

MW-2: Shallow downgradient well, located in surficial deposits and shallow bedrock in drainage southeast of fill area.

MW-3: Downgradient well, located in bedrock near confluence of unnamed tributary southeast of fill area.

MW-4: Downgradient well, located in bedrock near outlet of Minerva Tunnel east of fill area.

LW-1: Monitoring well installed through the refuse material to bedrock to a depth of 76 feet.

LW-2: Monitoring well installed through the refuse material to bedrock to a depth of 130 feet.

Well UM-1 serves as a background well, and the remaining wells serve as Points of Compliance for the existing groundwater monitoring program. Recently, LW-2 has been vandalized beyond the point of repair, and the county is developing an alternative detection method with the installation of 3000 feet of groundwater/leachate collection trenches.

Surface-water Monitoring. Seven surface water stations located near the landfill are sampled quarterly. The approximate locations of the surface water sampling stations are shown in Figure 2-2 and include the following:

S-1: North Fork of unnamed creek at Union Mine Road

S-2: South Fork of unnamed creek immediately east of Pendar Tunnel drainage confluence

S-3: Unnamed creek immediately west of Golden Gate Tunnel drainage confluence

S-4: Drainage from Minerva Tunnel at portal

S-5: Unnamed creek adjacent to Well MW-2

S-6: Martinez Creek, 300 feet upstream from unnamed creek confluence

S-7: Martinez Creek, 100 feet downstream from unnamed creek confluence

Landfill Gas Monitoring System. Landfill gas monitoring was conducted at the site by the California Air Resources Board from May 11 to May 14, 1987. Sample analysis detected concentrations of vinyl chloride, methylene chloride, chloroform, methyl chloroform, trichloroethylene, perchloroethylene, and benzene. No gas monitoring or control system is currently in place at the landfill.

Environmental Controls

The Union Mine Disposal Site has an active environmental control program in place to mitigate the adverse effects of the site's operation on the surrounding area. Major elements of the environmental control program to be continued through the life of the landfill include dust, odor, noise, litter and vector control.

Dust Control. Nuisance dust is controlled by the use of water sprays and dust pallatives. Dust control equipment is maintained on the site.

Odor Control. Odor is controlled at the landfill site through the use of daily and intermediate soil cover. Refuse is placed and compacted each day. The side slopes are then covered with a minimum of 6 inches of clean soil or other approved cover, and the top surface is covered with a minimum of 12 inches of clean soil or other approved cover.

Noise Control. Mufflers are standard features on landfill equipment to help control noise.

Litter Control. The operator of the landfill is required to keep all areas outside of the active tipping area free of litter and other foreign materials. The site is patrolled by a full time litter picker. Portable windscreens are used onsite during periods of high winds to contain blowing litter.

Vector Control. Vectors (insects and rodents) are controlled through the use of daily and temporary soil cover. Vectors are also controlled through the use of chemical sprays, traps, and other similar measures. According to County staff and EDL, Inc., vectors have never been a problem on the site.

B. DESCRIPTION OF THE PROPOSED PROJECT

The following data regarding the proposed landfill expansion and closure have been excerpted from the "*Design Report", Closure and Expansion of the Union Mine Disposal Site* (1991) and the "*Preliminary Closure and Post-closure Maintenance Plan – Union Mine Disposal Site"* (1991), both prepared by CH_2M HILL.

As previously discussed, the Union Mine Disposal Site consists of the existing landfill, which occupies approximately 33 acres. The proposed project includes a 14 acre expansion of the landfill into a drainage immediately south of the existing fill area, the construction of a leachate treatment facility, a leachate pump station, a contact water basin (which will be converted into a surface water detention basin at a later date), and leachate and leachate/septage transport pipelines. The proposed project also includes the incremental closure of the landfill areas upon reaching capacity. Although the Union Mine Disposal Site (existing and proposed expansion) has more than 20 years of refuse capacity remaining, closure activities would be conducted throughout landfill development.

The final landfill configuration would incorporate a minimum 3 percent gradient on the top surface, 3:1 sideslopes, and one 15-foot-wide bench for every 50 feet of vertical height. This configuration has an estimated refuse capacity of approximately 5,960,000 cubic yards. Site capacity assumptions are shown in Table 2-2. This capacity would provide an estimated landfill service life of 22.6 years. Service life calculations and assumptions are shown in Table 2-3.

The purpose of the landfill expansion is to provide the county with refuse capacity for more than 20 years at present rates. There is not expected to be an increase in the daily volume of waste accepted at the landfill (with the exception of increases due to normal population growth). No significant increases in the number of vehicle trips to the landfill are expected. No new or additional equipment is expected to be needed at this time, and no additional personnel are expected to be

Table 2-2

ESTIMATED SITE CAPACITY ASSUMPTIONS
UNION MINE DISPOSAL SITE

Air Space (cubic yards)	6,250,000
Refuse Capacity (cubic yards)	4,960,000
Refuse Capacity (tons)	2,480,000[a]
Landfill Operations	
Daily and Intermediate Cover (cubic yards)	1,000,000
Final Cover (cubic yards)	240,000
Construction Operations	
Liner, Leachate Collection and Removal System (LCRS), and Operations Layer (cubic yards)	50,000
Borrow Area Excavation (cubic yards)	200,000

[a] Refuse capacity is calculated based on the volumetric ratio of 5:1 (refuse:daily and intermediate cover) and the average end method utilizing planimetered areas. Final landfill slopes are designed at a 3:1 (horizontal:vertical) slope with 15-foot-wide benches at 50-foot vertical intervals.

Table 2-3

LANDFILL LIFE CALCULATIONS AND ASSUMPTIONS
UNION MINE DISPOSAL SITE

Year	Population	Tons[a]	In Place (cu yd)[b]	Remaining Refuse Capacity (cu yd)
1990	97,800	108,000	216,000	4,744,000
1991	101,807	111,998	223,976	4,520,024
1992	105,951	116,546	233,092	4,286,932
1993	110,246	121,271	242,542	4,044,390
1994	114,697	126,167	252,334	3,792,056
1995	119,311	99,028	198,056	3,594,000
1996	124,094	102,998	205,996	3,388,004
1997	129,050	107,112	214,224	3,173,780
1998	134,186	111,375	222,750	2,951,030
1999	139,510	115,793	231,586	2,719,444
2000	145,026	79,764	159,528	2,559,916
2001	150,743	82,909	165,818	2,394,098
2002	156,667	86,167	172,334	2,221,764
2003	162,806	89,543	179,086	2,042,678
2004	169,166	93,041	186,082	1,856,596
2005	175,757	96,666	193,332	1,663,264
2006	--[c,d]		201,065	1,462,199
2007	--[c,d]		209,103	1,253,091
2008	--[c,d]		217,472	1,035,619
2009	--[c,d]		226,171	809,448
2010	--[c,d]		235,218	574,230
2011	--[c,d]		244,627	329,603
2012	--[c,d]		254,412	75,191
2013	--[c,d]		264,589	-189,398

[a] Based on Union Mine Disposal Site estimate of 300 tons per day times 360 days/year = 10,800 tons per year (tpy) ÷ population 90 = 1.1 tons/person/year for years 1990-1994 = 1.1 tons/person/year; for years 1995-1999 = 0.83.

[b] Assumes in-place density of 1,000 lb/cu yd.

[c] Year 1990-2005 population projections based on estimated of AB 939 waste generation population projections.

[d] Year 2006+ assumes constant refuse projection increase of 4 percent.

needed to operate the facility. Operations and procedures are expected to remain the same as present. Some modifications regarding the types of wastes to be accepted have been made. The wastes that are proposed to be accepted are listed below.

Wastes Proposed to be Accepted for Disposal

The Union Mine Disposal Site is designated as a Class III solid waste disposal site and, as such, is authorized to receive only nonhazardous or inert waste (see Title 14, CCR, Section 17225.31 and Title 23, CCR, Sections 2523 and 2524). A description of acceptable wastes including nonhazardous, inert, and other wastes is included in this section as well as prohibited waste.

NONHAZARDOUS WASTE

Nonhazardous solid waste, as defined in Title 23, CCR, Section 2523, includes "all putrescible and nonputrescible solid, semisolid, and liquid wastes, including garbage, trash, refuse, paper, rubbish, ashes, industrial wastes, demolition and construction wastes, abandoned vehicles and parts thereof, discarded home and industrial appliances, manure, vegetable or animal solid and semisolid wastes, and other discarded solid or semisolid wastes; provided that such wastes do not contain wastes which must be managed as hazardous wastes, or wastes which contain soluble pollutants in concentrations which exceed applicable water quality objectives, or could cause degradation of waters of the state" (i.e., designated waste).

Residential and municipal solid waste, as defined in the Public Resource Code, Section 40191, is considered acceptable waste for the Union Mine Disposal Site. In addition, any waste that meets the Class III criteria for waste disposal, as specified in the Waste Discharge Requirements, is acceptable.

Typical wastes in this group include:

1. Municipal and Industrial Origin

- Garbage from handling, preparing, processing, or serving of food or food products (excluding grease trap pumpings and cannery wastes--see Proposed Liquid Wastes).

- Rubbish such as paper, cardboard, tin cans (provided they are empty, opened, dry, and 5 gallons or less in volume), cloth (provided it is not oil- or solvent-soaked industrial cleanup rags), and glass.

- Construction and demolition materials such as paper, cardboard, wood, scrap metal (provided it is not friable, finely divided, or powdered), glass, clay products, plastic, rubber products, roofing paper and shingles (provided they contain less than 1 percent friable asbestos), and wallpaper.

- Street refuse such as sweepings, dirt (provided it is not from a roadside chemical spill or in any way contaminated), leaves, catch basin cleanings, litter, yard clippings, glass, paper, wood, and scrap metals.

- Dead animals and portions thereof.

- Abandoned vehicles.

- Ashes from household burning.

- Medical waste rendered non-infectious and hospital or laboratory wastes authorized for disposal to land by official agencies charged with control of plant, animal, or human disease.

2. Agricultural Origin

- Plant residues and waste from plant products from the production of crops including, but not limited to, stalks, vines, culls, stubble, hulls, lint, untreated seed, roots, stumps, prunings, and trimmings.

- Dried manures.

- Dead animals or portions thereof.

- Adequately cleansed pesticide containers provided that the following minimum criteria are met:

  - Metal, plastic, and glass containers used for liquids or powders shall have been processed by rinsing and draining or some other approved decontamination technique. The processing procedure shall include or be equivalent to at least triple rinsing with thorough draining and puncturing of the containers. Rinsewaters produced shall be placed in the spray tank or disposed of in accordance with requirements of the RWQCB.

  - Prior to any pesticide container disposal at the landfill, the County Agricultural Commissioner must certify that such a processing program exists and is utilized by pesticide users in the County.

Note: Paper or plastic sacks and bags used for pesticide dusts and wettable powders are not to be disposed of at this landfill.

Inert Waste

Inert waste, as defined in Title 23, CCR, Section 2524, includes waste that "does not contain hazardous waste or the soluble pollutants at concentrations in excess of applicable water quality objectives and does not contain significant quantities of decomposable waste." These are generally non-water soluble, nondecomposable solid materials.

Typical wastes in this group include:

- Construction and demolition wastes such as earth, rock (provided the earth and/or rock materials are not from a chemical spill, leaking underground tank, or similar excavation/cleanup), concrete rubble, and asphalt paving fragments.

- Vehicle tires.

- Industrial wastes such as clay products from brick and pipe manufacturing, glass, and inert slags (provided the wastes are blemishes, seconds, or rejects of similar product manufacturing and were never used or came in contact with chemical processing), inert tailings, inert rubber scrap, and inert plastics.

Other Acceptable Wastes

Other wastes acceptable at the Union Mine Disposal Site include:

- Ashes (characterized and accepted on a case-by-case basis)
- Low-level contaminated soil (<100 ppm total petroleum hydrocarbons)
- Treated waste wood such as utility poles, railroad ties, fence and guard rails, and sign posts
- Auto shredder wastes
- Asbestos (in labeled containers composed of a minimum of double, 6 mil plastic bags)
- Dredge and fill materials

Proposed Liquid Wastes

The following liquid wastes will be accepted at the Union Mine Disposal Site after the proposed leachate/septage treatment facility and the Class II surface-water impoundment are constructed.

- Sewage sludge
- Water treatment sludge
- Septic tank pumpings
- Holding tank pumpings
- Storm drain cleanings
- Grease trap pumpings
- Grit and grease

PROHIBITED WASTE

The Union Mine Disposal Site does not accept hazardous waste for disposal. Hazardous waste includes those wastes defined by Title 23, CCR, Section 2521 as hazardous. These include any waste that must be managed as a hazardous waste pursuant to Title 22, CCR, Sections 66300, et seq. Hazardous wastes are regulated by the Department of Health Services and are defined as:

> "A waste, or combination of wastes, which because of its quantity, concentration, physical, chemical, or infectious characteristics may either:
>
> 1. Cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible illness; or
>
> 2. Pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported or disposed of, or otherwise managed."

Hazardous waste also includes waste classified as "extremely hazardous waste by Health and Safety Code Section 25117(b). Extremely hazardous wastes are defined as wastes, or combination of wastes, which have been shown through experience or testing to pose an extreme hazard to the public health because of their carcinogenicity, acute toxicity, chronic toxicity, bioaccumulative properties or persistence in the environment, when improperly treated, stored, transported, disposed of, or otherwise managed (Health and Safety Code Section 25117).

Hazardous wastes commonly found in municipal refuse include:

Household Cleaners

- Drain openers
- Oven cleaners
- Wood and metal cleaners and polishers

Automotive Products

- Oil and fuel additives
- Grease and rust solvents
- Carburetor and fuel injection cleaners
- Air conditioning refrigerants
- Starter fluids
- Batteries

Home Maintenance and Improvement Products

- Paint
- Paint thinners
- Paint strippers and removers
- Adhesives

Lawn and Garden Products

- Herbicides
- Pesticides
- Fungicides/wood preservatives

Miscellaneous

- Chemical toilet wastes
- Pool chlorine and other products

Other Prohibited Wastes

Designated Waste

Designated waste, as defined in Title 23, CCR, Section 2522, includes "nonhazardous waste which consists of, or contains pollutants which, under ambient environmental conditions at the waste management unit, could be released at concentrations in excess of applicable water quality objectives, or which could cause degradation of waters of the state." Designated waste also includes

"hazardous waste which has been granted a variance from hazardous waste management requirements."

Designated waste may only be discharged at Class I or Class II waste management units.

Liquid Waste

Any waste with less than 50 percent solids by weight and a moisture content in excess the moisture-holding capacity of the landfill is prohibited from disposal (Title 14, CCR, Section 17743) at the Union Mine Disposal Site until the proposed leachate/septage treatment facility and the Class II surface-water impoundment are constructed.

Burning Waste

No burning wastes or "hot loads" are accepted at this facility.

Miscellaneous Prohibited Waste

The following waste types are currently prohibited from disposal but may be accepted after the proposed Class II surface-water impoundment and groundwater/leachate treatment facility are constructed:

- Sewage treatment sludge
- Septage waste
- Cogeneration ash (from industrial or municipal incinerators)
- Grease trap pumpings
- Cannery wastes

1. Landfill Expansion

A timeline of the proposed landfill expansion/closure activities is presented in Figure 2-3. The initial activity of the landfill expansion/closure project would commence in 1991, and would consist of the development of the southern 17-acres of the existing fill area for partial closure. The 17-acre area would receive

PROJECTED CONSTRUCTION, OPERATIONS AND CLOSURE SCHEDULE

UNION MINE DISPOSAL SITE

Dec 23, 1991

conbar01.wk

DESCRIPTION	1991–1992	1992–1993	1993–1994	1994–1995	1995–1996	1996–1997	1997–1998	1998–1999	1999–2000	2000–2001	2001–2002	2002–2003	2003–2004
ADMINISTRATIVE													
Repayment of Revolving Fund Loan													
Consultant Contracts													
Construction Management Contracts													
INTERIM FACILITIES													
Intermediate Cover													
Surface Water Drainage Control													
EXPANSION FACILITIES													
Site Clearing, Grading, and Preparation													
Leachate/GW Collection Trench													
Contact/Surface Water Retention Basin													
Surface Water Drainage Ditches													
Groundwater Underdrain													
HDPE and/or Clay Liner Base													
Leachate Collection System													
Mine Shaft/Tunnel Plugging													
Relocation of Union Mine Road													
Scales													
Leachate/Septage Treatment Plant													
LANDFILL OPERATIONS ACTIVITIES													
Self Monitoring Program													
Groundwater Monitoring Program													
Regulatory Permitting													
Site Improvements													
LEA/SEPTAGE Treatment (EID Connect Fee)													
LEA/SEPTAGE Treatment (Utilities)													
Surface Water Treatment (NPDES)													
CLOSURE ACTIVITIES													
AB 2448 Closure Fund													
North East Area (5+ Acre Area)													
Northern Wet Weather (10+ Acre Area)													
Expansion Area (14–Acre Area)													
Final Lift Area (31–Acre Area)													
BOUNDARY PROPERTY ACQUISITION													
BLM (93.55 Min Acres)													
AP#92–011–21 (20.6 acres)													

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Timeline of Expansion/Closure Activities

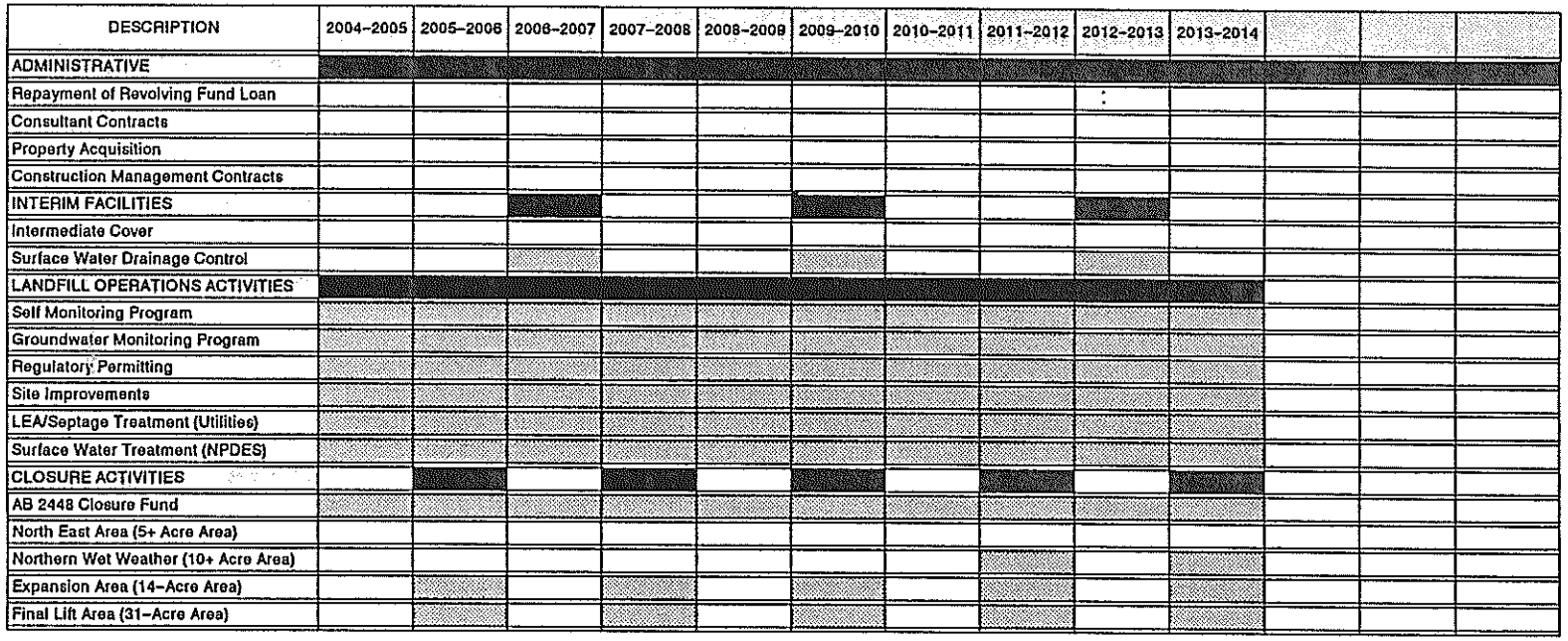
FIGURE 2-3a

PROJECTED CONSTRUCTION, OPERATIONS AND CLOSURE SCHEDULE

UNION MINE DISPOSAL SITE

December 23, 1991

conbar02.wk



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Timeline of Expansion/Closure Activities

FIGURE

2-3b

intermediate soil cover which has a hydraulic conductivity that would not exceed $1x10^{-6}$ cm/sec and would meet the requirements of the RWQCB. A ~~synthetic~~ clay liner would be installed on the southern slope of the 17-acre area adjacent to the expansion area, where the slope and liner would act as one of the boundaries of the expansion area. The ~~synthetic~~ clay liner would have a hydraulic conductivity of greater than $1x10^{-6}$ cm/sec. When the currently active northern 16-acre area of the existing landfill reaches capacity in 1994–1995 (remaining capacity is approximately 1,100,000 cubic yards or approximately 5 years), it would be closed, and final cover would be placed. Figure 2-4 shows the expected final topographic contours of the 16-acre area after closure. Construction of the expansion area is expected to commence in 1994–1995. The 14-acre expansion area would then begin to receive fill. It is expected to have a refuse capacity of 1,700,000 cubic yards, or 8 years. The last area to receive fill would be on top of the 17-acre fill area and the 14-acre expansion area. This area together has an estimated refuse capacity of 2,160,000 cubic yards or 9.6 years. The 17-acre and 14-acre areas would be closed and receive final cover together. The completed landfill final cover profile would be completed in approximately 22.6 years, or by the year 2012. Figure 2-5 shows the final closure contours for the completed landfill.

Figure 2-6 is a schematic cross section through a typical modern sanitary landfill, showing the major components of environmental control systems such as will be developed in the proposed expansion project. Figure 2-7 shows the excavation plan for the 14-acre expansion area. The expansion area would be developed to current state standards, with clay and composite liners (low permeability clay layer plus a high density polyethylene (HDPE) geomembrane), a leachate collection system, and possibly a landfill gas collection and monitoring system. These features and other development plans are discussed in more detail below.

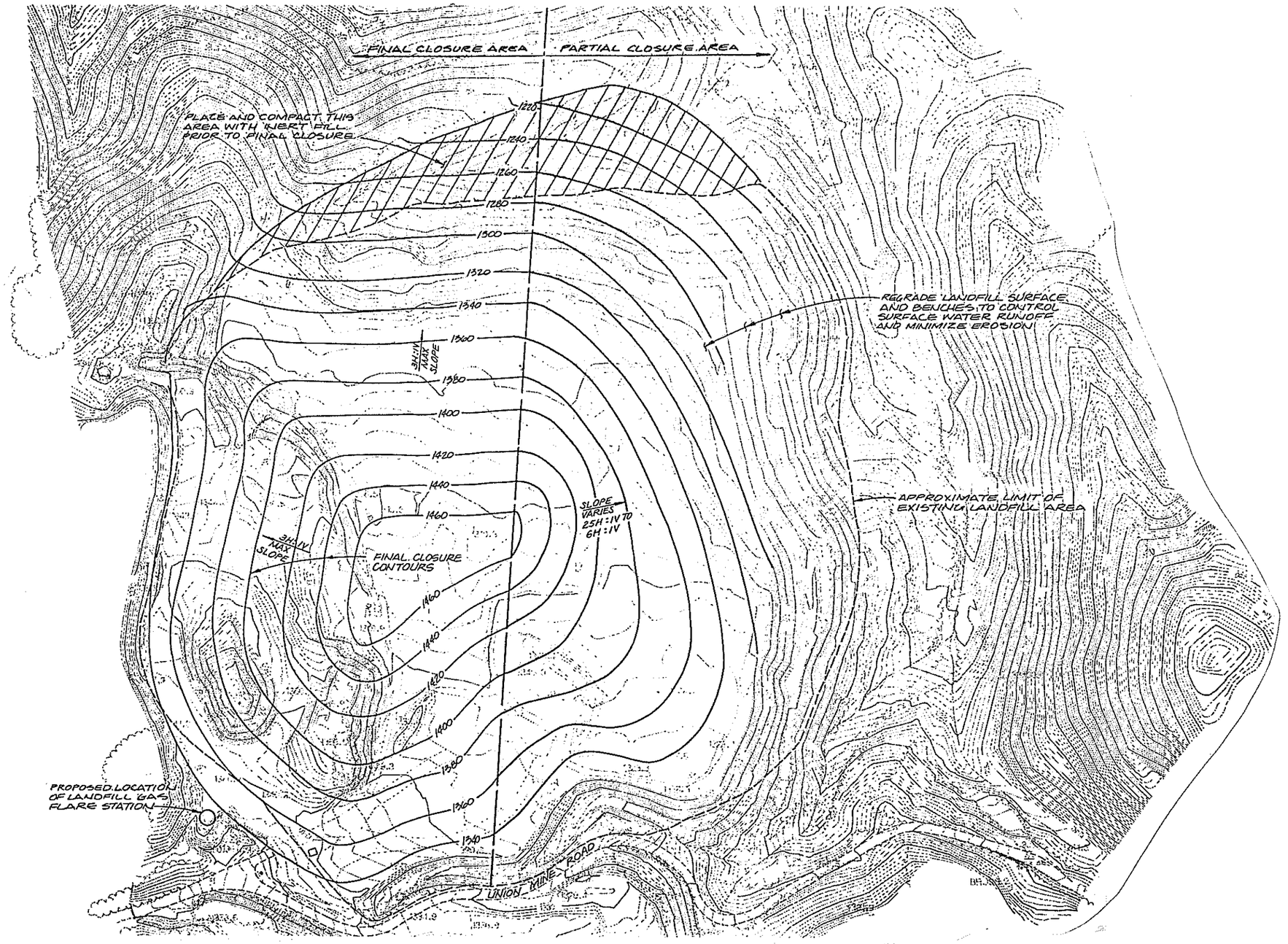
a) Land Acquisition and Rezone

The County acquired a 20-acre privately owned parcel and plans to acquire 93+ acres of BLM land for use as a buffer zone around the landfill. These lands are currently zoned RA-20 (Residential Agricultural – Twenty-acre minimum lot size). The current land use designations on these lands is Rural Residential – Agriculture (1 dwelling unit /10-160 acres). The County proposes to rezone the

20-acre parcel and 200+ acres of BLM property (of which the County will acquire at least 93+ acres in a land exchange) from RA-20 to A (Agricultural). The parcels proposed for rezoning are shown on Figures 1-3, C, D and E. Per county code, the disposal of refuse is permitted within the Agricultural (A) zone with a special use permit. No waste disposal activities are proposed to occur in the buffer area at this time. An expansion of landfill disposal into the buffer area or removal of borrow material from the buffer area would require the approval of a special use permit which is a discretionary action (vs. allowed by right) and is defined as a project, and thus requires environmental review under CEQA. Such a discretionary action would almost certainly require a project Environmental Impact Report (EIR) prepared in accordance with CEQA. In addition, such action would require new permits and authorizations from the Community Development Department, California Integrated Waste Management Board, the Central Valley Regional Water Quality Control Board, the California Air Resources Board and the California Department of Forestry/El Dorado–Diamond Springs Fire District. Actions that may occur in the buffer area include installation of groundwater monitoring wells and landfill gas perimeter monitoring probes; development of a water detention basin; and, possibly a surface water conveyance pipeline or trench system. The land acquisition and rezoning is discussed further in Section 3K (Land Use).

b) Mine Plugging

The Union Mine Disposal Site is located in the Mother Lode mining district of the western Sierra Nevada foothills. The area in the vicinity of the landfill was mined for gold extensively from 1850 to 1940. Three mine tunnels, one stope, and one mine shaft are located in or adjacent to the expansion area (Figure 2-8) Prior to placement of the expansion area liner system, the existing abandoned mine openings would be plugged. Several alternative methods may be used to accomplish this. The plug must be able to support the overburden pressure of the proposed landfill. The pressure on the mine tunnel plug is estimated as the combined weight of the liner (nominal 2 feet of clay), 100 feet of compacted waste and interim cover, and a final cap. The anticipated bearing pressure is relatively low compared to the estimated bearing capacity of the in-place rock and the proposed plug.



SOURCE: CH_2M Hill 1991

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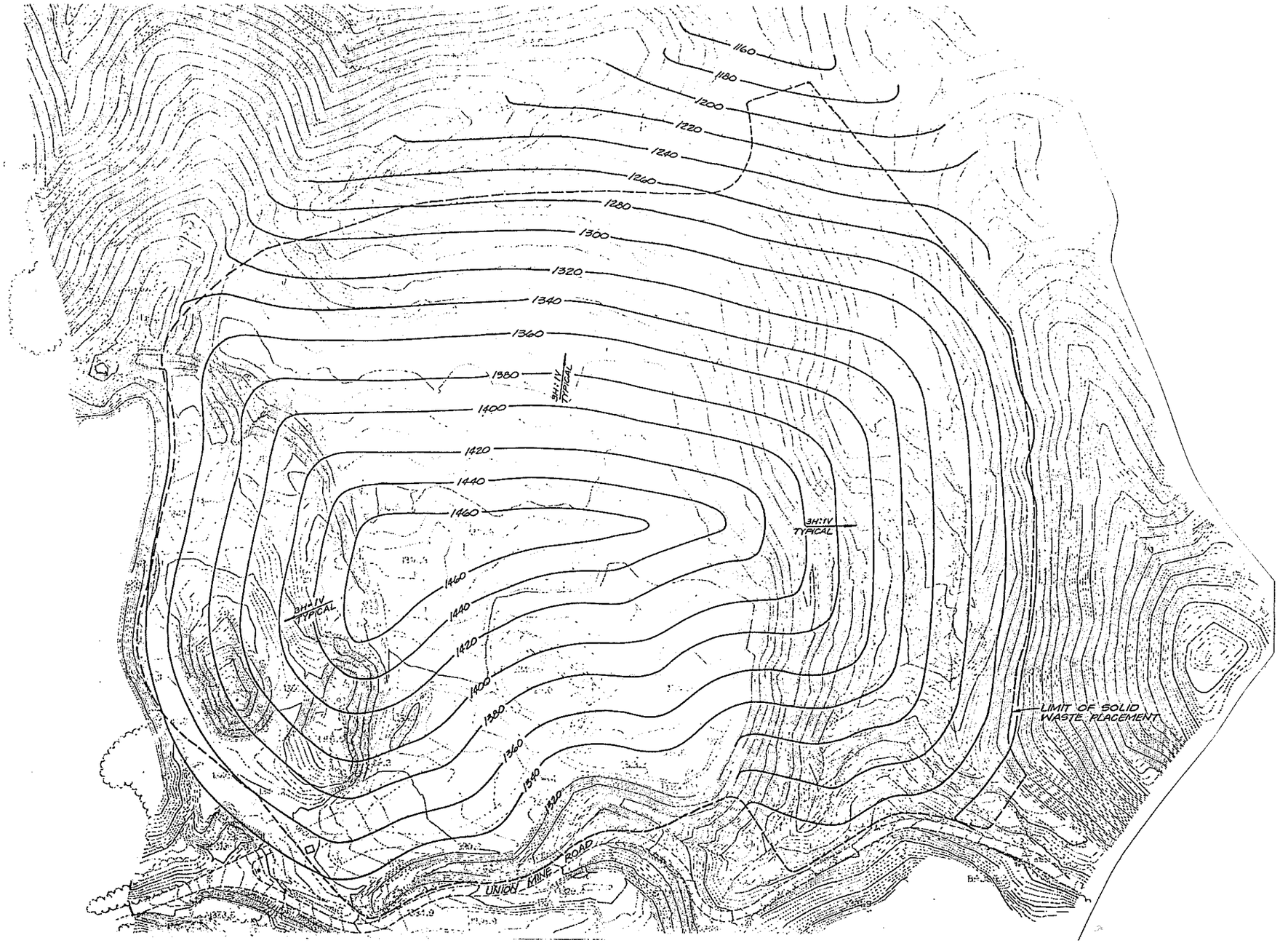
Existing Landfill, Final and Partial Closure Contours

FIGURE 2-4



SOURCE: CH_2M Hill 1991

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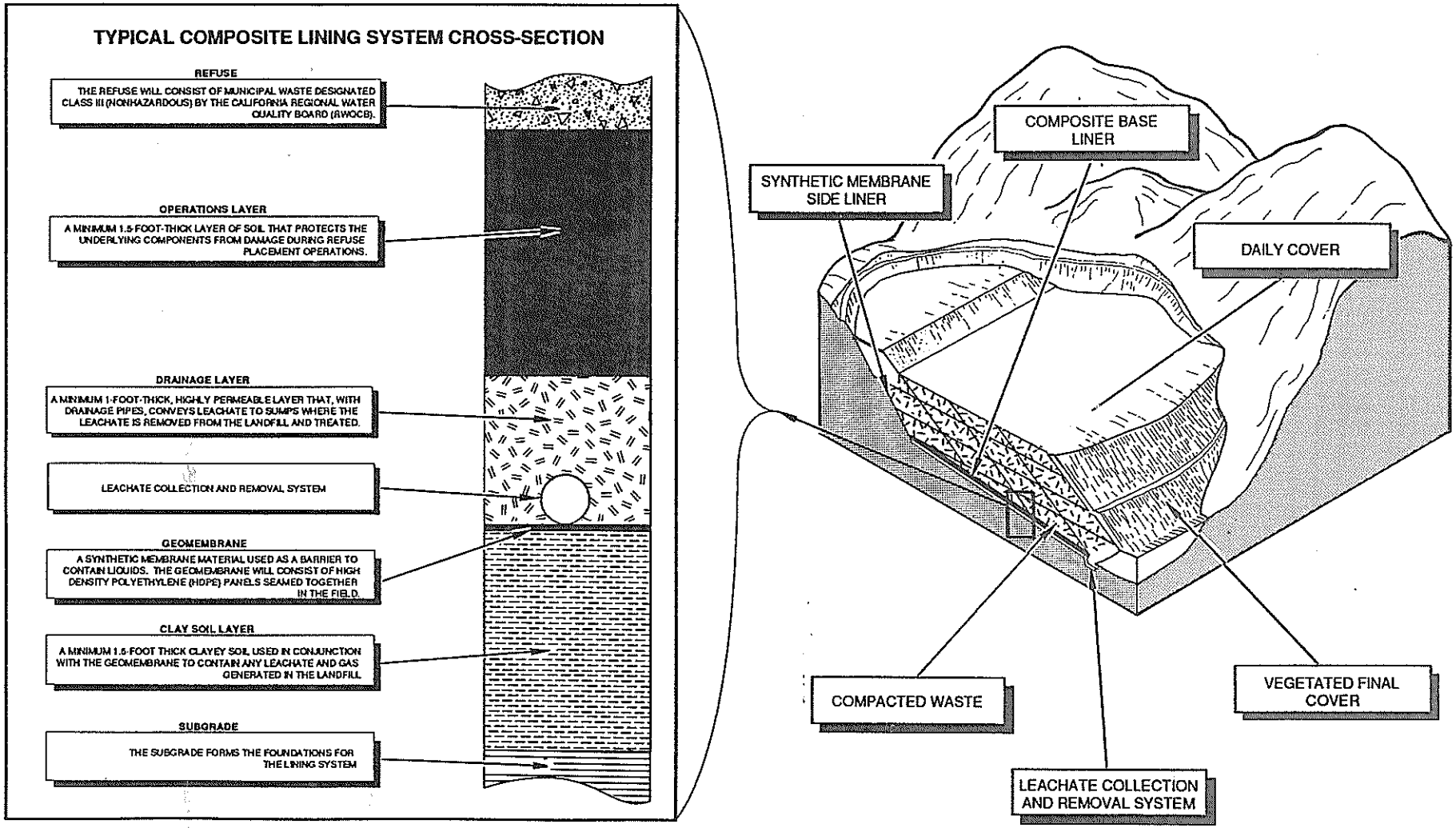
Final Closure Contours

FIGURE 2-5



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Perspective View and Cross-Section of a Typical Modern Landfill

FIGURE 2-6

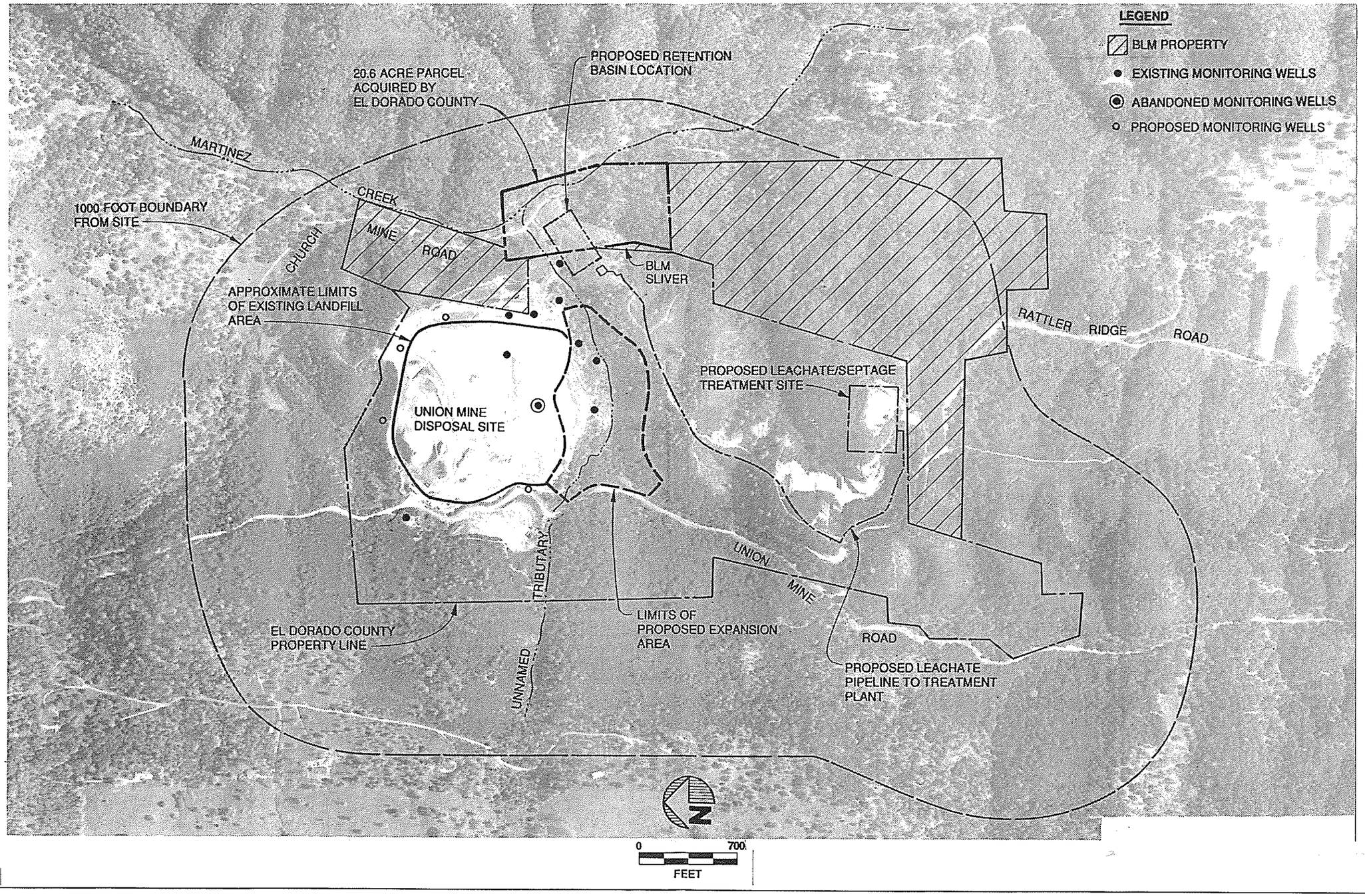
Differential settlement must be minimized between the plug and the surrounding rock. The plug must be approximately as stiff as the rock so that each material undergoes similar compression when the load is applied as the landfill is filled. If the plug compresses more or less than the rock, localized forces may be exerted on the clay liner, which could cause the clay to crack. Cracks in the clay liner could provide a route for leachate to migrate into the underdrain outside of the landfill liner, bypassing the leachate collection system. Selecting a plug material with approximately the same stiffness as the surrounding rock would eliminate the possibility of cracking the clay liner.

CH_2M HILL evaluated several plug alternatives, and concluded that Portland cement concrete would be the material best suited to provide adequate bearing and limit differential settlement between the proposed mine tunnel plug and the surrounding rock. A schematic drawing depicting a concrete plug is shown in Figure 2-9. In addition to having strength comparable to the rock, Portland cement concrete can be placed relatively easily and would conform to the irregular shapes of the mine tunnels.

Water seepage has been observed from the Minerva Tunnel; therefore, the Minerva Tunnel plug would be designed to collect possible future groundwater seepage and discharge it to the leachate collection system. A Portland cement type would be specified to maximize the resistance of the concrete to chemical attack from groundwater seeping from the Minerva Tunnel. Such a consideration also would provide the highest degree of certainty for resistance against potential future seeps of unknown composition. A seepage collection pipe would also be installed in the Minerva Tunnel plug to allow the collection of potentially impacted groundwater.

c) Excavation and Fill Sequence Plan

The preliminary excavation and fill sequence plan is shown on Figure 2-10. The proposed fill operations would continue in the active eastern portion of the northern 16-acre area and move west. When the 16-acre area has reached capacity, fill operations would then commence in the western most portion of the expansion area, and the fill operations would move incrementally to the east. When the expansion area has reached its preliminary capacity, fill operations would then resume in the partially closed southern 17 acres of the existing fill area, starting in

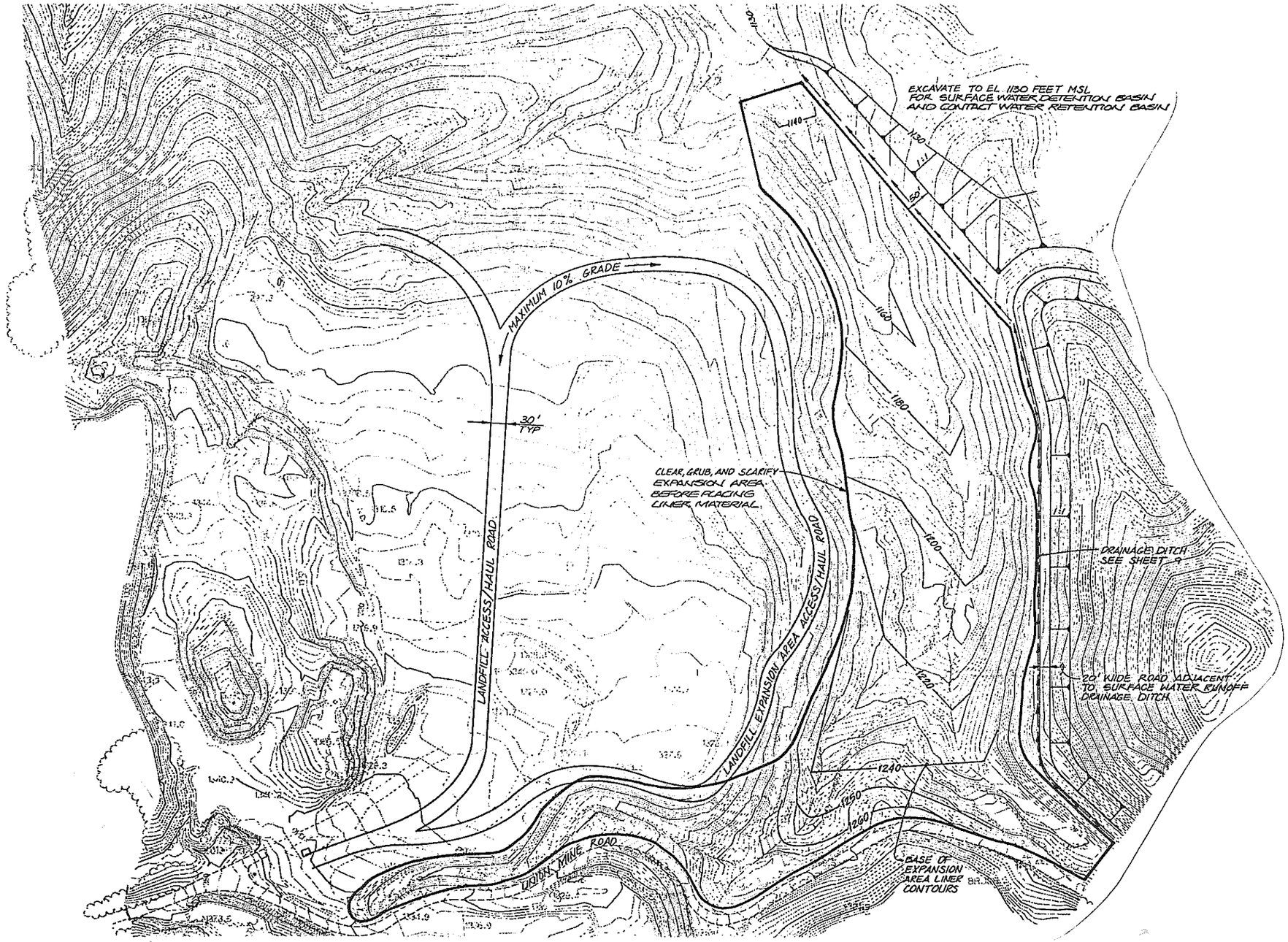


SOURCE: CH_2M Hill

ERCE

Union Mine Disposal Site Showing Proposed Expansion Area
(1000 Foot Buffer Zone and BLM Acreage Proposed to be Acquired)

FIGURE
C

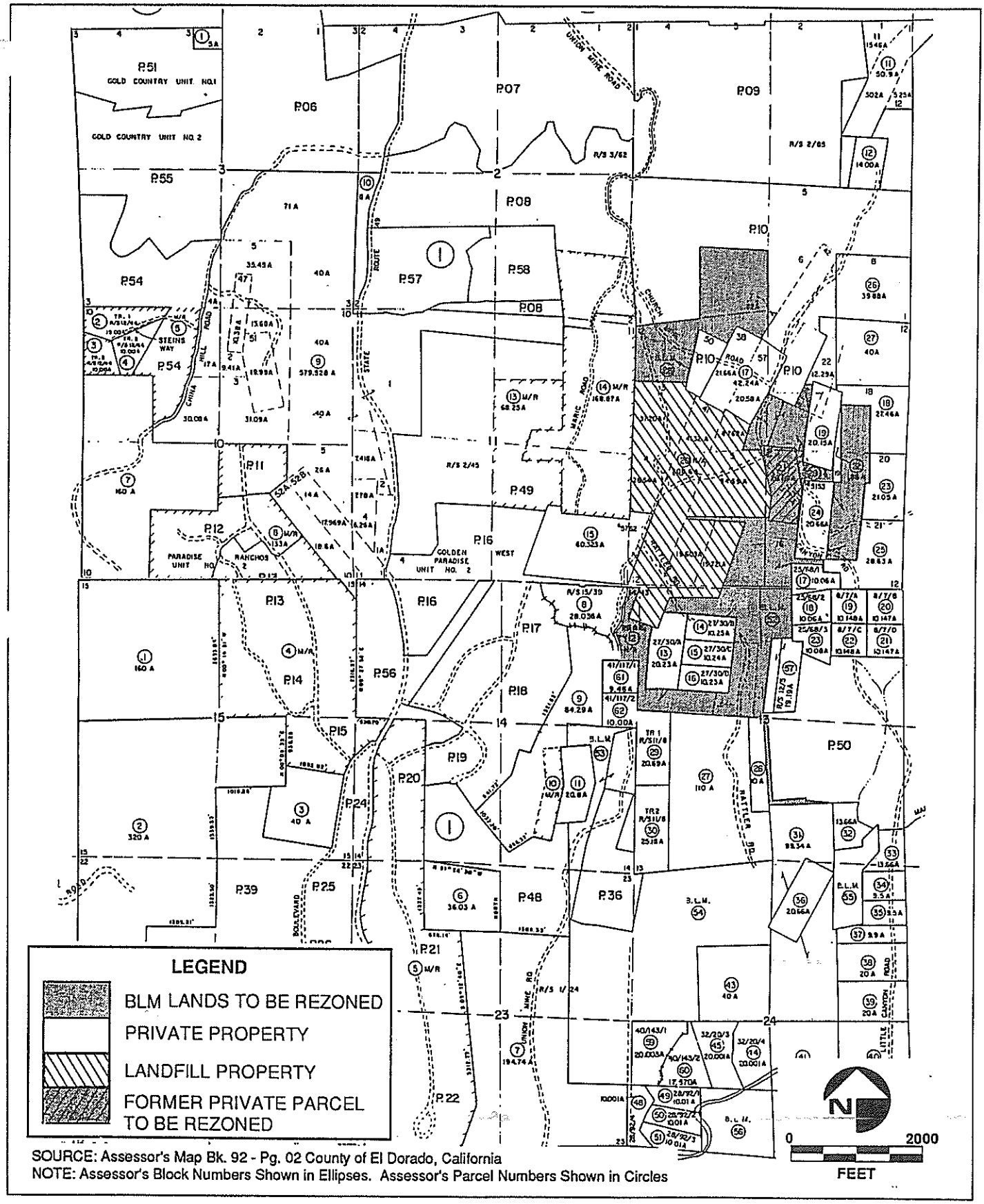


SOURCE: CH_2M Hill 1991

ERCE

Excavation Plan - Expansion Area

FIGURE 2-7



SOURCE: Assessor's Map Bk. 92 - Pg. 02 County of El Dorado, California
NOTE: Assessor's Block Numbers Shown in Ellipses. Assessor's Parcel Numbers Shown in Circles

ERCE

Lands Subject to Re-Zone

FIGURE D

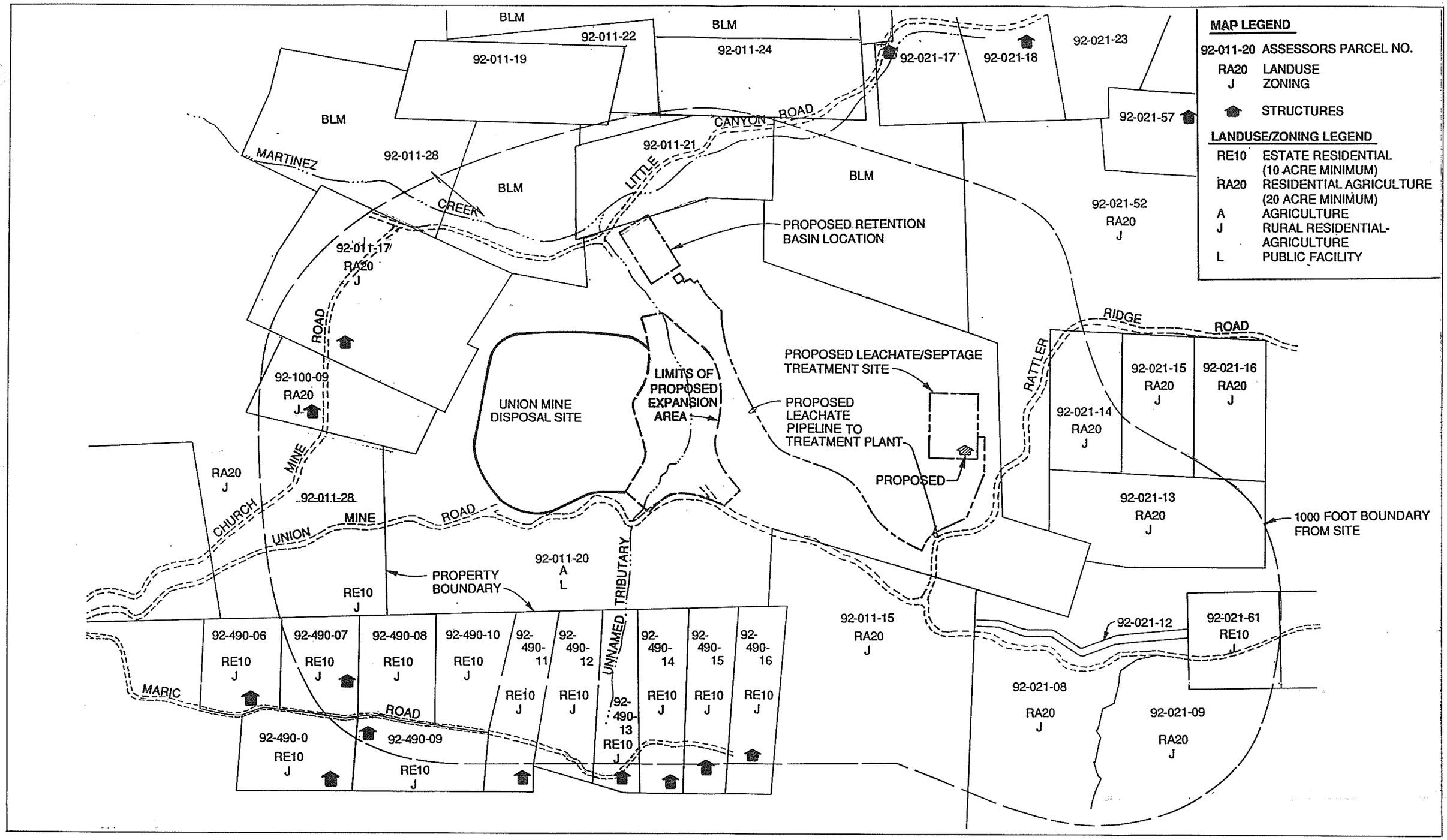
the east and moving west. When the 17-acre area is filled to capacity, the expansion area and the 17-acre area together would have final cover placed and be closed.

Excavated soil from the expansion area would be stockpiled nearby and would be used for daily and intermediate cover. Additional cover soil would be excavated from the identified borrow area, immediately south of the expansion area (Figure 2-11). Additional soil cover would be generated from the realignment of Union Mine Road, from construction of the contact water basin, and from the borrow pit No. 2 identified on Figures 2-11 and 2-13.

d) Liners

The expansion area would be constructed with a liner system as required to meet state standards (Title 14 and Title 23, Chapter 15). Both synthetic liners, high density polyethylene geomembrane (HDPE), and composite liners, clay soil, and HDPE would be used. The purpose of liner systems is to inhibit the downward migration of leachate and to allow for the collection and removal of leachate. A synthetic liner (60-mil HDPE geomembrane) would be placed on the natural slopes of the expansion area and on the side slopes of the existing fill area. The bottom of the expansion area canyon would be constructed with a composite liner consisting of a 2-foot-thick layer of low-permeability clay soil overlain by a 60-mil HDPE geomembrane. The limits for each type of liner are shown on the design drawings along with the final contours for the liner top (Figure 2-12).

The expansion area canyon would be graded to provide a minimum of 5 feet of separation between the groundwater and the bottom of the liner. A groundwater underdrain would also be constructed, and the canyon bottom would be filled with native fill and graded to the contours shown in Figure 2-12. This fill would provide a smooth surface on which the clay portion of the composite liner would be placed. The clay portion of the composite liner would be a 2-foot-thick layer of low-permeability ($K \leq 1 \times 10^{-6}$ cm/sec) clay soil. This liner would most likely consist of a mixture of native soil mixed with imported clay from the Ione area. The mixing would be by pugmill or rotovator. The mixture would be placed in four lifts of 8 inches and would be compacted to at least 95 percent relative compaction (ASTM D 698). Once the clay has been placed and compacted, the synthetic low



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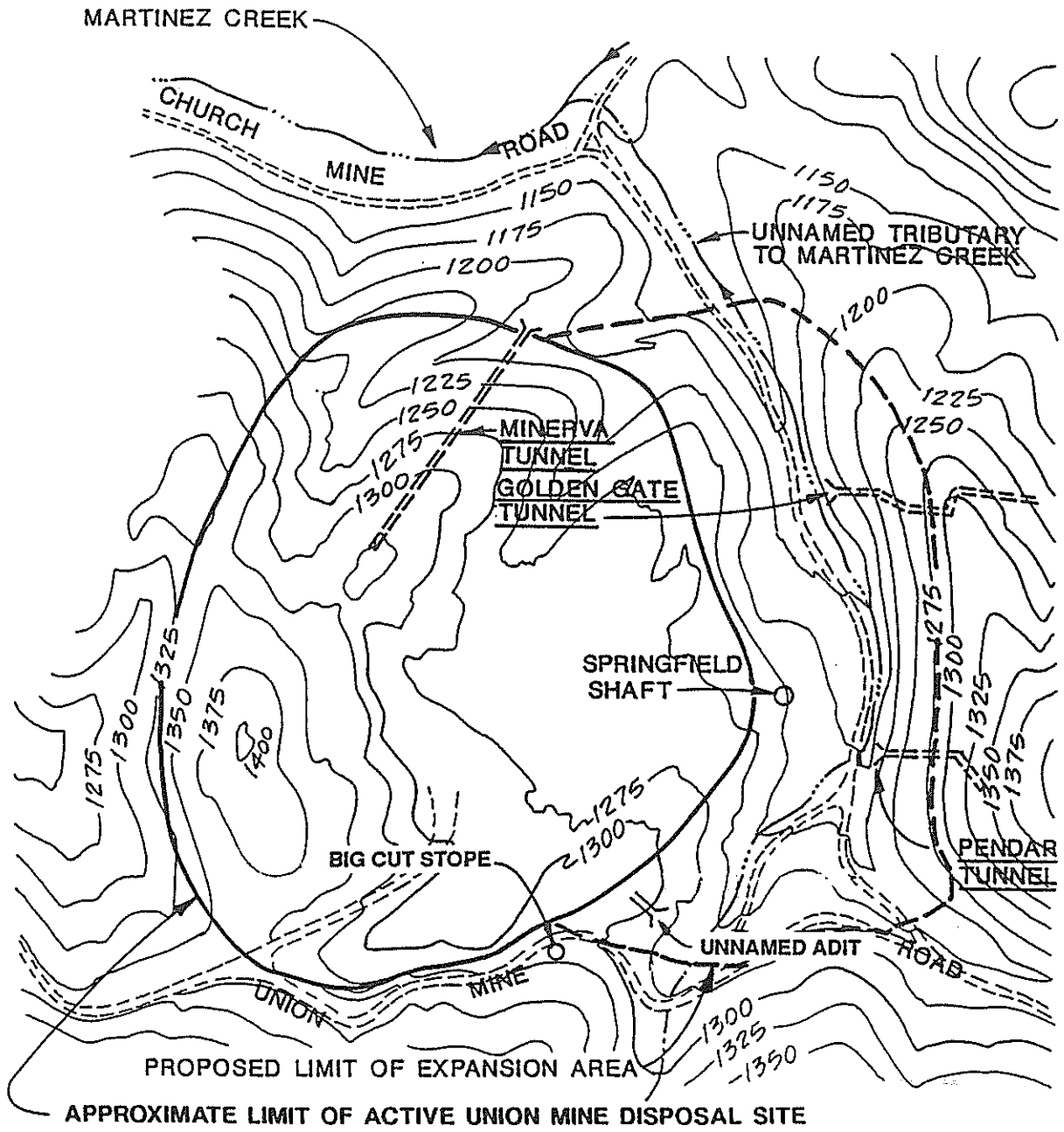
Current Parcel Numbers and Land Use Designations Adjacent to the Union Mine Disposal Site

FIGURE E



SOURCE: CH_2M Hill 1991

FIGURE

2-8

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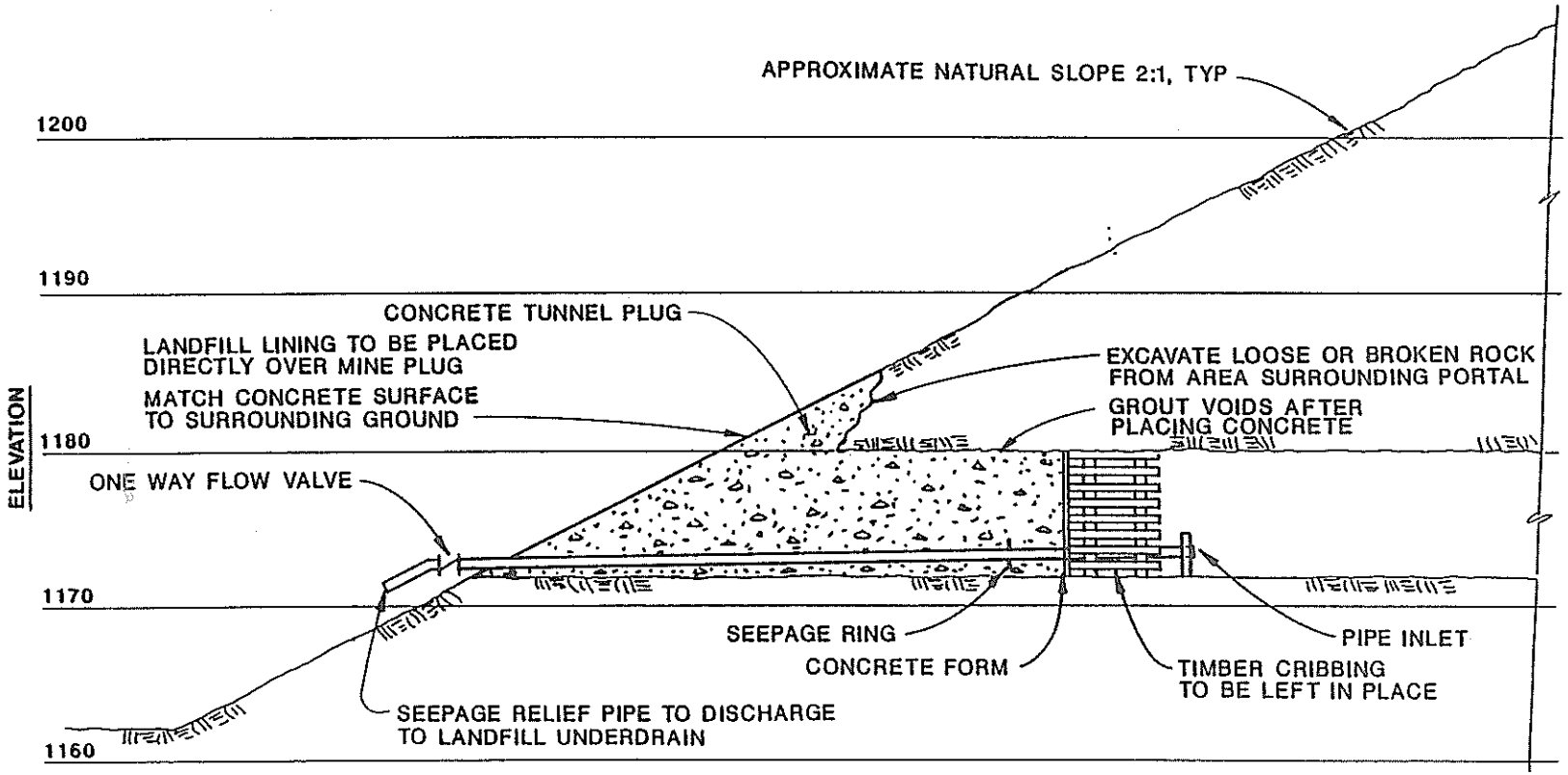
Mine Opening Locations



SOURCE: CH_2M Hill 1991

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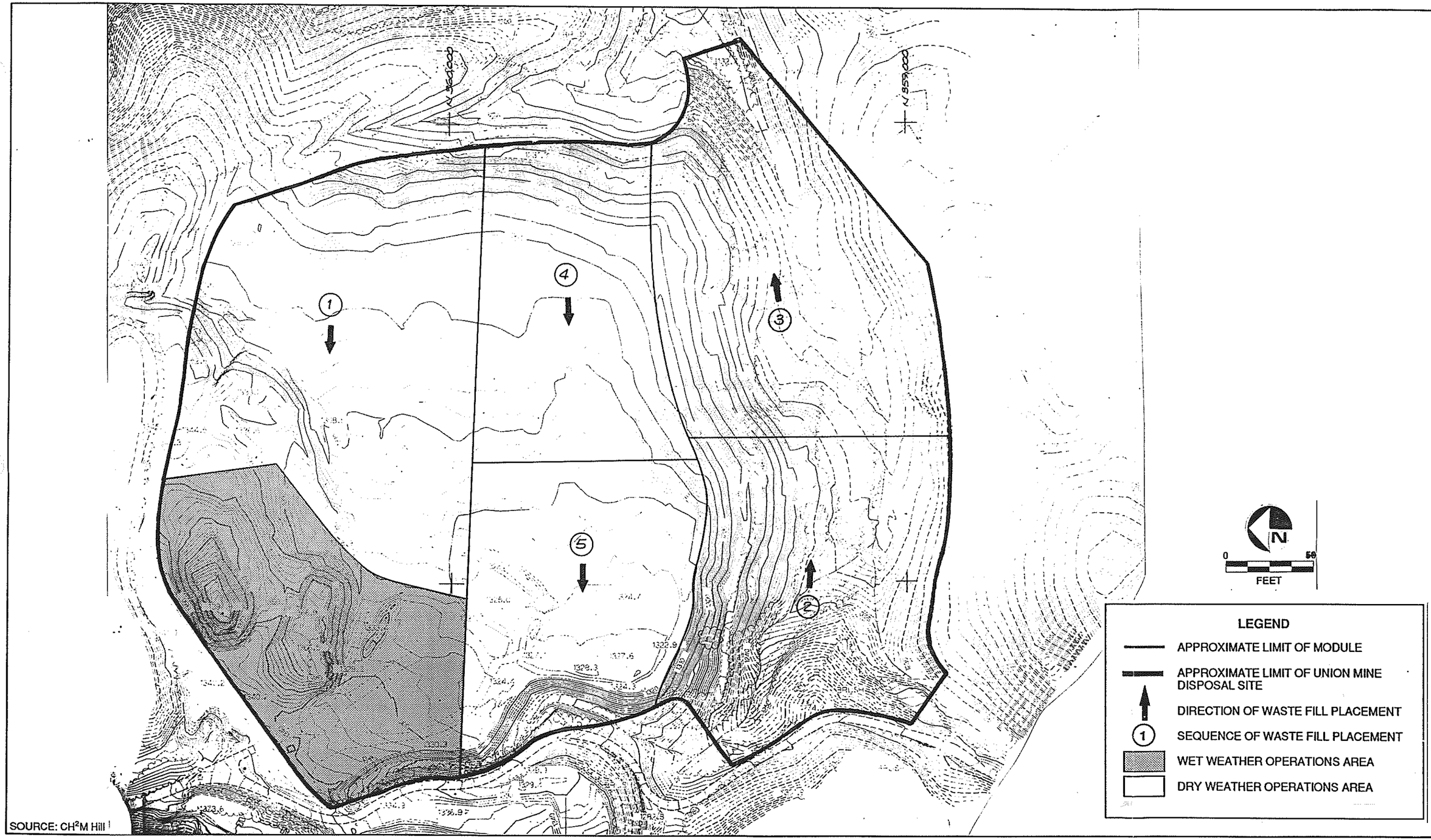
Schematic Mine Tunnel Plug

FIGURE 2-9



SOURCE: CH²M Hill

ERC Environmental and Energy Services Co.

Excavation and Fill Sequence Plan

FIGURE 2-10

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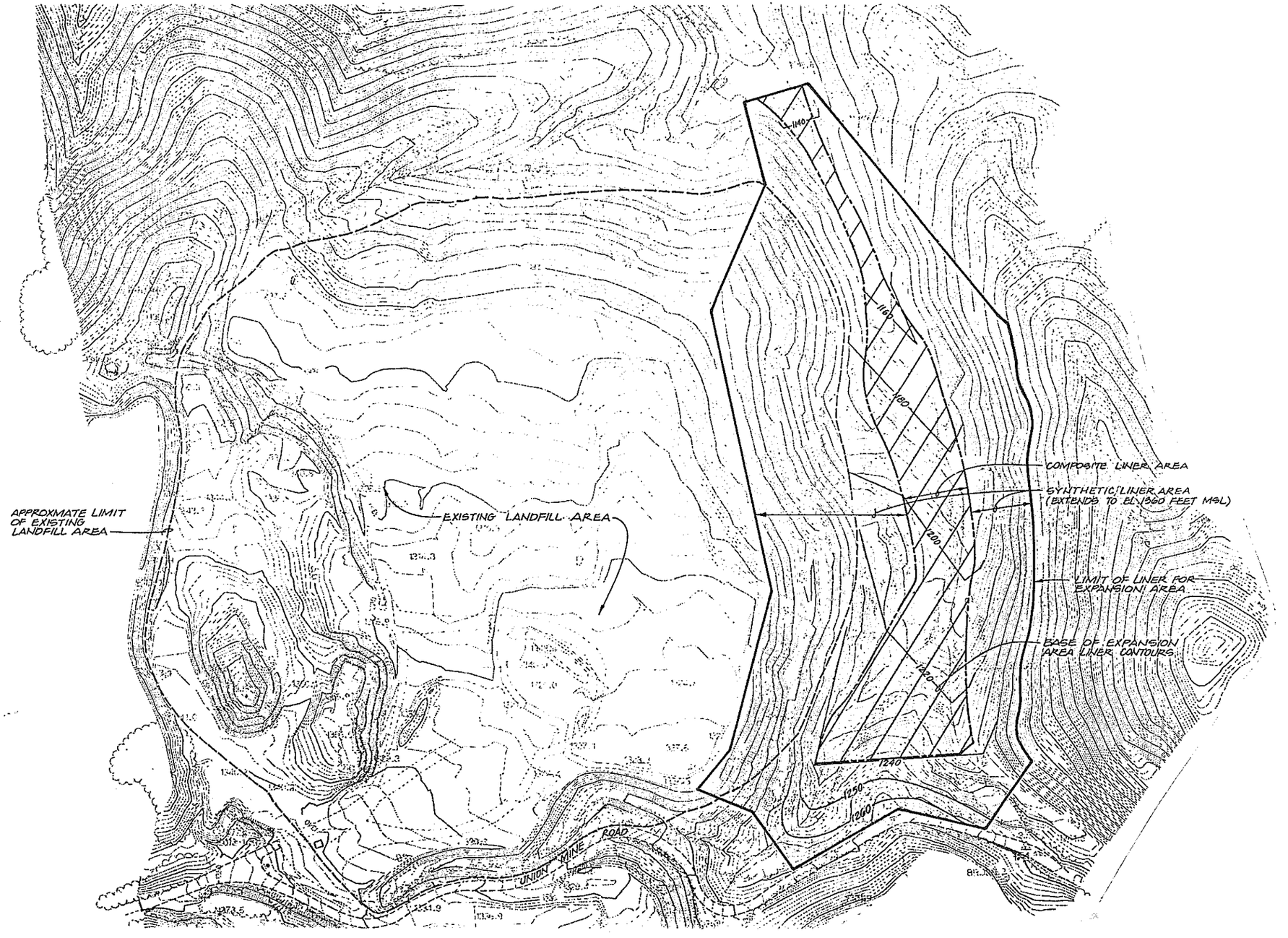
Cover Soil Borrow Plan - Expansion Area

FIGURE 2-11



SOURCE: CH_2M Hill 1991

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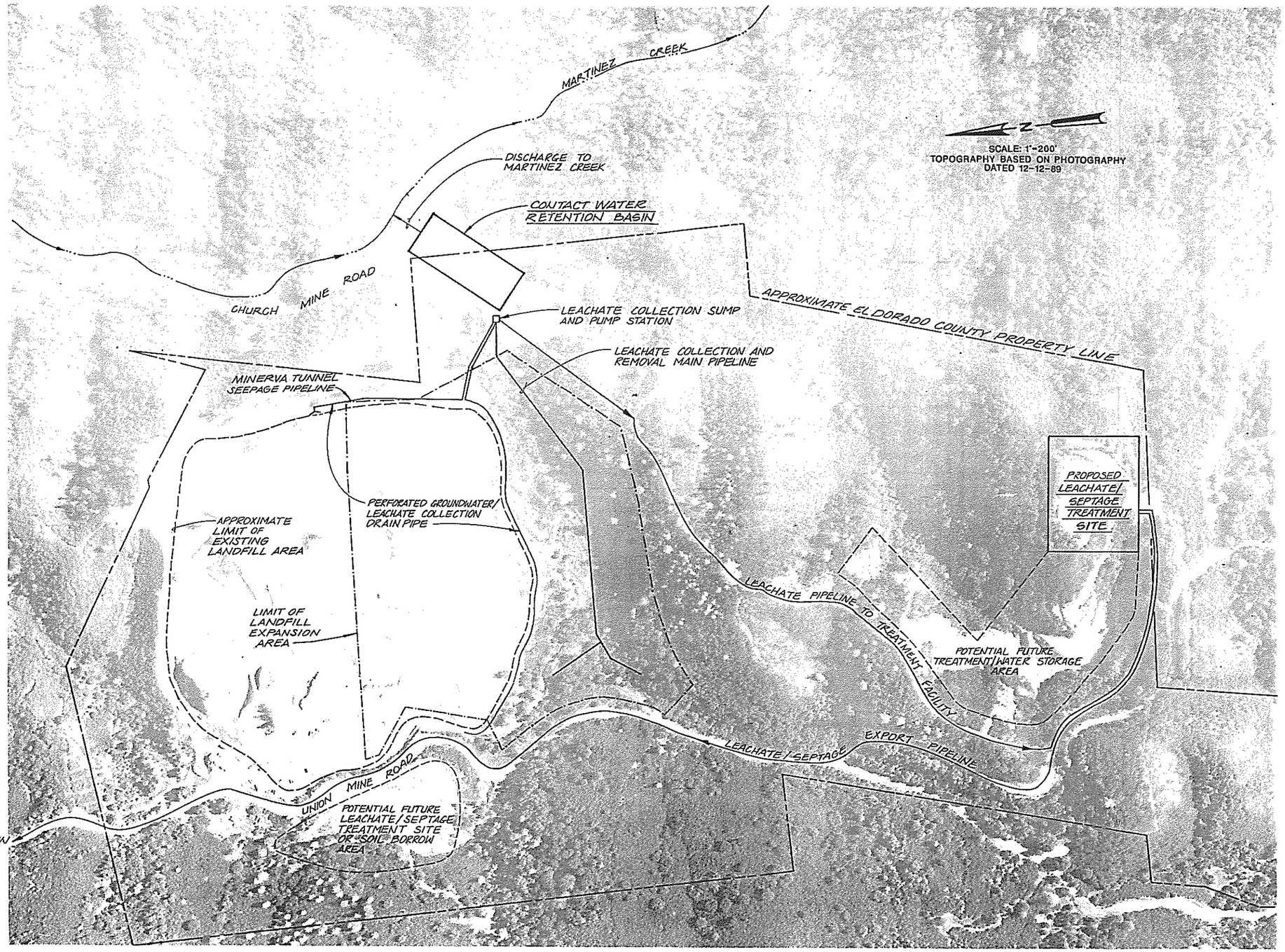
Expansion Area Liner Plan

FIGURE 2-12



SOURCE: CH_2M Hill 1991

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Aerial Photograph and Schematic Location of Proposed Facilities

FIGURE 2-13

permeability ($1x10^{-7}$ cm/sec) 60-mil HDPE geomembrane would be placed over the clay. Once the liner has been constructed, the leachate collection and removal system would be installed. The leachate collection and removal system is discussed in detail in Section h.

The liner system would most likely be placed in two phases. The first phase would consist of lining from the west end of the canyon to about halfway down the canyon for a distance of approximately 600 feet. This area would then begin receiving waste. When this area is covered with waste to a depth of 10 to 20 feet, the remaining part of the expansion area would be lined, and further waste placement would continue.

e) Intermediate Cover

A landfill intermediate cover which consists of a minimum 12 inches of compacted soil or other approved material is required by CCR Title 14 Article 7 over surfaces which have received fill and where no activity would occur for 180 days. The top surface of the southern 17-acre area of the existing landfill would receive intermediate cover to limit the infiltration of water into the waste until final cover is installed after the expansion area reaches its final capacity. Limiting infiltration would reduce the production of leachate, thereby minimizing future impacts of the landfill on the environment. The intermediate cover would have a permeability of less than 1×10^{-6} cm/sec.

f) Landfill Gas Monitoring and Control System

A landfill gas (LFG) monitoring system would be developed at the Union Mine Disposal Site following closure of the existing area and eventually the expansion area. Previous work indicates that very little LFG is currently being generated at the site (Calderon Air Solid Waste Assessment Test [SWAT] Report prepared in 1987).

To maintain environmental safety and to meet Air Pollution Control District (APCD) and California Integrated Waste Management Board requirements, gas monitoring probes would be installed at the site's perimeter following closure to detect subsurface migration of LFG. Landfill gas emissions from the landfill surface

would also be monitored periodically to determine if LFG is migrating or is present in concentrations triggering the need for a LFG collection and control system. Detection of potential odor nuisances associated with the release of LFG and from daily landfilling operations would be monitored at the same time.

The LFG monitoring network at the Union Mine Disposal Site would be designed based on migration potential and environmental requirements established by the federal, state, and local agencies. The location and depth of gas monitoring probes at the landfill boundary would take into account subsurface geology, cell depths, refuse filling patterns, land use around the landfill, and concerns of residents surrounding the landfill. Gas monitoring probes would be placed in the priority areas based on these criteria. The probes would be placed at intervals not exceeding 1,000 feet. Depths of these probes would be equivalent to the lowest elevation of refuse within a 1,000-foot radius of each monitoring probe (in accordance with regulations of the IWMB). The number of probes per monitoring well would be site-specific.

g) Surface-water Management

Surface water management, sediment control, and erosion control plans have been developed for the existing landfill area and the expansion area at the Union Mine Disposal Site. The main features of this system are shown on Figure 2-13.

There are two types of surface water conditions which would occur at the disposal site. These are contact and non-contact surface water flows. Contact water is surface water that has come into contact with the refuse fill and may be contaminated. Contact water has to be treated as a classified waste until it is tested and determined not to be hazardous. Non-contact water is that which has not come into contact with waste material. The surface-water management system proposed to be constructed for the existing landfill area would occur after final closure and all surface water from this area would be categorized as non-contact water.

Both contact and non-contact water would be directed to a Class II surface impoundment through a series of ditches and pipes. This surface impoundment is being constructed to meet the requirements of the RWQCB's Cease and Desist Order No. 89-244 issued to the Union Mine Landfill facility for mitigation of

leachate/mining wastewater discharges. Construction of this basin is scheduled to begin in September 1991. Because construction of this basin is a result of an enforcement action (Cease and Desist Order) it is exempt from the provisions of CEQA (Title 14 Section 15321 (a)(2)). However, it is evaluated in this EIR because it is an integral part of the proposed project. The locations of the surface impoundment is shown on Figure 2-13, and Figure 2-14 shows the system of ditches and pipes proposed to collect the flows. The surface impoundment would initially be used as a contact water basin. After characterization of the contact and noncontact flows, it is expected that the surface impoundment would be converted to a sedimentation basin for non-contact water, and all contact water would be routed to the contact water and leachate holding lift station and directed to the treatment plant for treatment. The Class II surface water impoundment would be approximately 80 feet by 320 feet and 8 feet deep, and sized for the 1000-year 24-hour storm in accordance with Title 23 CCR Chapter 15.

Surface water runoff from the upslope drainage areas surrounding ~~west of~~ the landfill would be collected, routed around the landfill, and discharged into Martinez Creek. An interceptor ditch or pipe along the ~~west side of the county road~~ surrounding areas including the buffer would convey this water to a bypass ditch or pipe along the southern perimeter of the expansion area. Existing culverts crossing the county road would be removed or plugged. A pipe drop and baffled-pipe outlet structure would be used to dissipate energy from the 130-foot vertical drop back to the natural channel downstream from the landfill. As refuse is placed in the expansion area, the ditch constructed on the south side of the existing landfill area would eventually be buried by the expansion area refuse. This flow would be discharged into the expansion area perimeter ditch. After closure, noncontact surface water from the closed expansion area and the upslope area on the south side of the expansion area would be collected in a perimeter ditch. This ditch would be constructed to have the ultimate capacity to accommodate non-contact water from the expansion area, and water from the upslope area to the south after final closure.

Temporary ditches would be constructed around the active working face within the expansion area to collect and divert water coming in contact with the refuse. Contact water collected at the active face area (which is approximately 1 to 2 acres in size) would be discharged into the contact water holding lift station and either treated, used onsite, or discharged to Martinez Creek.

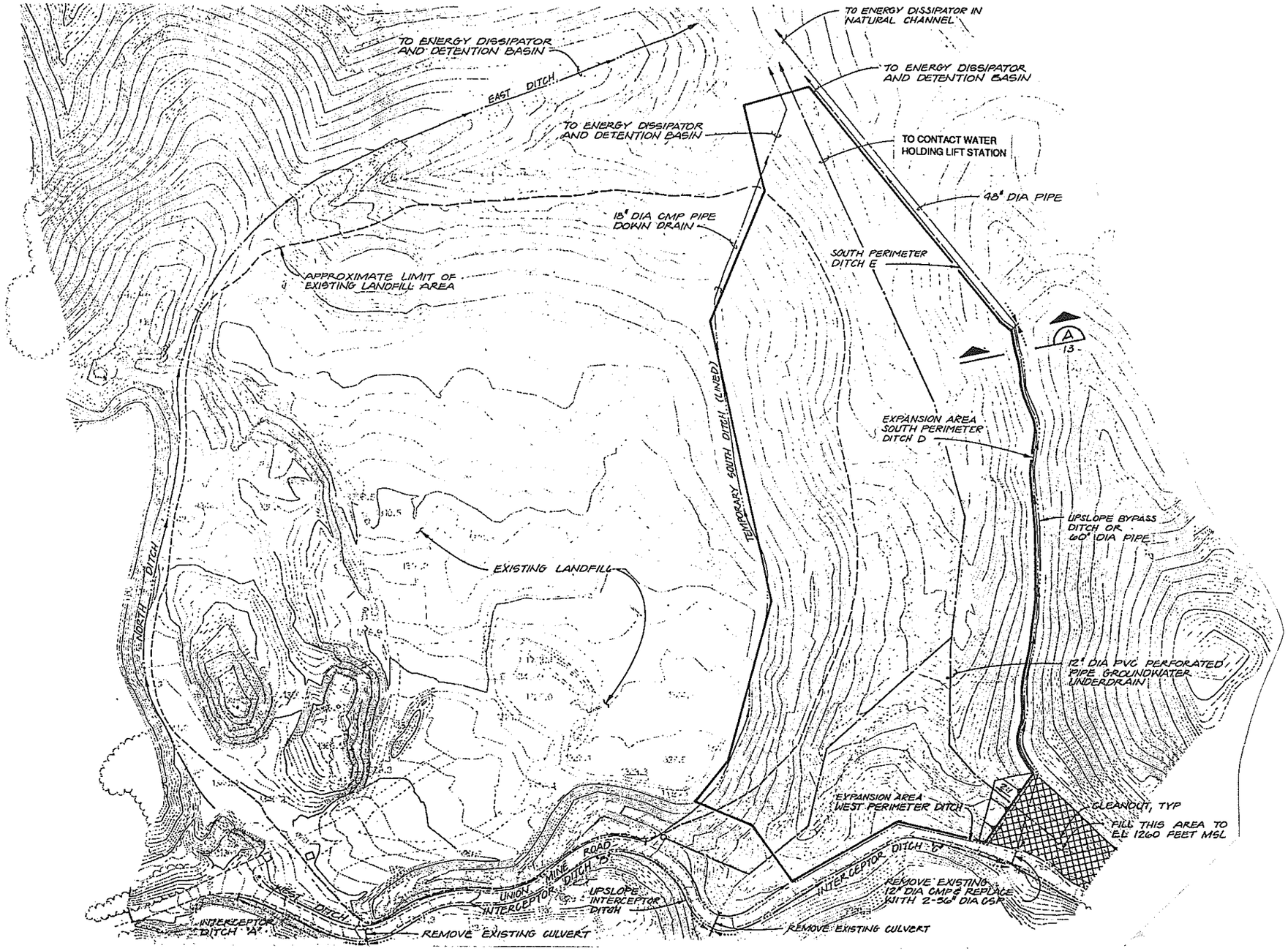
h) Leachate Collection and Conveyance System

A leachate collection and removal system (LCRS) would be constructed in the expansion area in accordance with state regulations (CCR Title 23 Chapter 15). Leachate is contaminated water that is generated when precipitation, surface water, or groundwater infiltrates into the refuse and its chemistry is altered as a result of contact with the waste. At the Union Mine Disposal Site, leachate is generated in the existing landfill and would inevitably be produced in the expansion area. No LCRS is currently in place at the Union Mine Disposal Site. The proposed system to be installed as part of the expansion activities would collect leachate generated from the expansion area, as well as from the existing landfill.

Based on the hydrogeologic evaluation of the Union Mine Disposal Site (CH_2M HILL 1991c), the principal source of water that can interact with the waste and become leachate is infiltration of precipitation that falls on the landfill surface. The approximate quantity of leachate has been estimated by the hydrogeologic staff of CH_2M HILL. The estimated sources of leachate-contaminated water are as follows:

Source	Annual Flow Range (gpm)
Minerva Tunnel	5 to 20
Existing Area	15 to 17
Expansion Area	8 to 10
Toe Drain Groundwater Collector	50 to 100
Total	78 to 147

As part of the proposed expansion project, leachate from the existing landfill will be collected in a 2-foot-wide toe drain trench located at the base of the south slope of the existing landfill. A perforated pipe surrounded by coarse gravel would be used to collect shallow underflow moving from beneath the existing landfill toward the expansion area canyon. This drain would extend to a depth of approximately 8 feet and flow by gravity to the leachate collection sump and pump station. The location of the leachate collection sump and pump station is shown on Figure 2-13. The



SOURCE: CH_2M Hill 1991

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Surface and Groundwater Collection Plan

FIGURE 2-14

layout of the toe drain is shown on Figure 2-14. The flow from the existing landfill is expected to be 50 to 100 gallons per minute (gpm) of groundwater and up to 17 gpm of leachate. Water exiting the Minerva Tunnel (on the eastern side of the landfill area) appears to be a mixture of groundwater and leachate. After plugging the tunnel, a pipe through the plug to the leachate collection pump station would be installed. This flow is expected to be relatively constant at 5 to 20 gpm.

Leachate generated in the expansion area would be collected at the base of the compacted refuse by a granular drainage blanket covering the composite liner in the canyon bottom. Perforated HDPE collection pipes set in the granular drainage layer would be used to transport the leachate to the pump station where it would be then be pumped to the treatment plant. Cross sections of the landfill and leachate collection system are shown on Figures 2-6 and 2-15. No gravel or collection pipes would be required on the synthetic liner placed on the slopes since gravity would force the leachate to the canyon bottom where it would be collected. Based on modeling results conducted by CH_2M HILL, up to 10 gpm of leachate is estimated to be collected from the expansion area. In accordance with Title 23 California Code of Regulations (CCR) Chapter 15 requirements, the leachate piping would be sized for twice the anticipated flow, or 20 gpm.

A leachate collection sump and pump station would be located at the toe of the landfill expansion area. Separate influent pipes would be provided for (1) Minerva Tunnel seepage, (2) toe drain groundwater collection, and (3) the expansion area leachate collection and recovery system (Figures 2-12 and 2-16). These flows would be measured separately and sampled to determine their characteristics. If any of the sources do not appear to be mixed with leachate, consideration would be given to releasing the water to the nearby surface drainage course.

i) Union Mine Road Realignment

The County proposes to re-align Union Mine Road beginning approximately 100 feet north of the existing landfill entrance for approximately 2000 feet to approximately the old entrance into Church Mine Road. The proposed road will consist of two 12-ft. wide traffic lanes, two 4-ft. gravel shoulders and a drainage ditch on the inside shoulder (Figure 2-17). The re-alignment will eliminate several existing abrupt curves, improve drainage along the roadway corridor, improve

traffic flows (both landfill ingress and egress as well as for Union Mine Road continuing traffic).

2. Leachate/Septage Treatment Plant

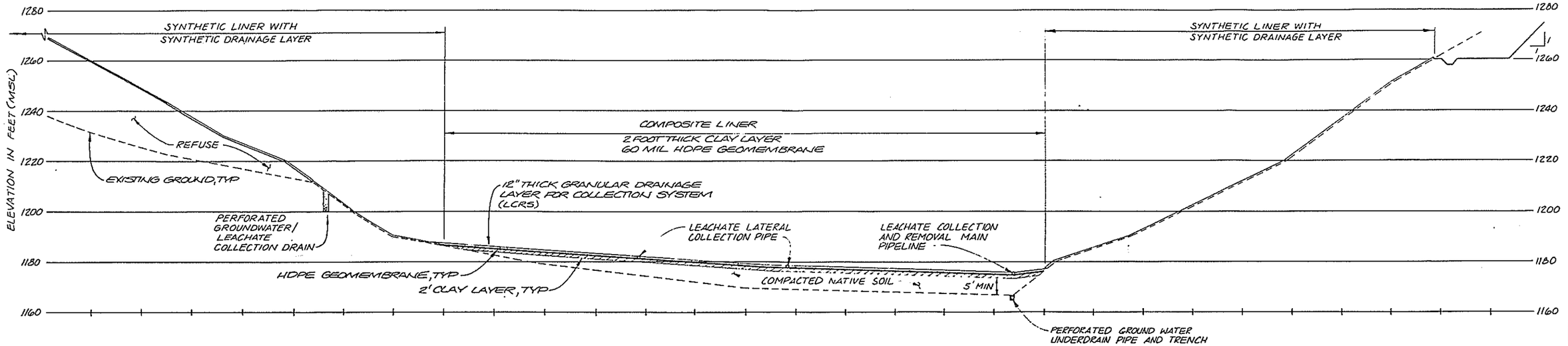
As part of the landfill expansion/closure project, the County of El Dorado proposes to construct a treatment facility near the landfill that would treat leachate generated by the landfill and septage generated in the western portion of El Dorado County. The following discussion of the treatment plant is preliminary, and for information purposes only. The treatment plant will be subject to subsequent environmental review pursuant to the requirements of CEQA upon completion of engineering design.

Septage is municipal sewage pumped from septic tanks. The county proposes to construct the treatment plant on the descending ridge south of the landfill which is currently occupied by the Rod and Gun Club (refer to Figure 2-13). Leachate generated at the landfill would be pumped from leachate collection and removal system (LCRS) to the treatment plant via pipeline. Five to seven trucks per day containing septage would be trucked to the treatment plant from sources throughout the county. Effluent from the treatment system would be pumped through a force main located in Union Mine Road to the El Dorado Irrigation District (EID) force main in El Dorado. It would then be pumped to the Deer Creek Waste Water Treatment Plant (WWTP).

The county's proposal for a combined septage and leachate treatment facility was developed to accomplish the following objectives:

* Leveling of peak flows as compared to a facility treating leachate only.
* The availability of nutrients from septage for leachate treatment.
* Economic advantages of constructing a single treatment facility for both leachate and septage rather than two separate treatment facilities.

The treatment system would consist of an influent structure to screen the incoming septage and provide pH monitoring and adjustment, a series of aerated lagoons for treatment of the incoming biological oxygen demand (BOD) and metals (including aluminum, arsenic, barium, cadmium, chromium, cobalt, copper, nickel, and zinc),



SOURCE: CH2M Hill, 1991

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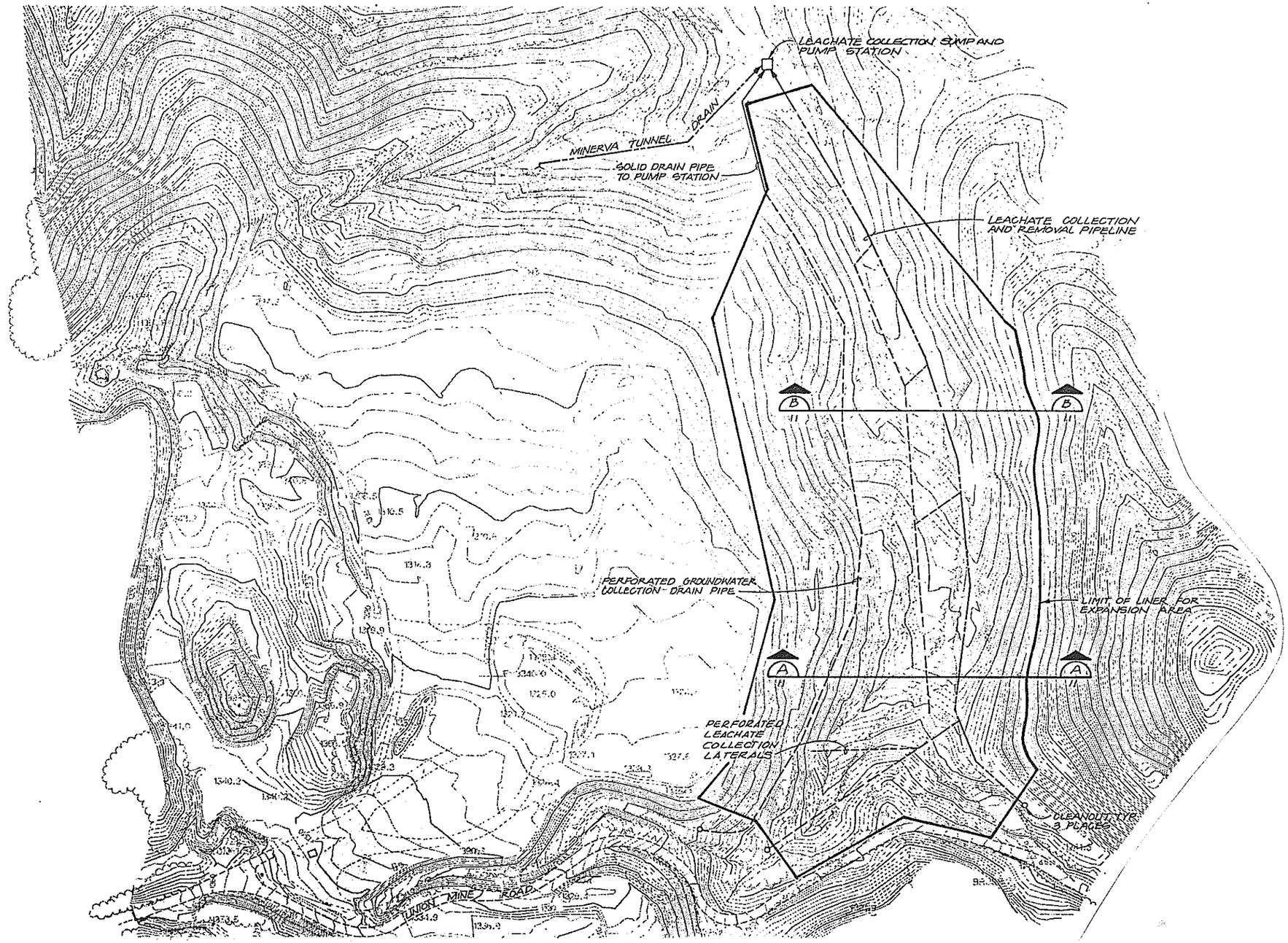
Expansion Area Cross-Section Showing Leachate Collection and Removal System

FIGURE
2-15



SOURCE: CH_2M Hill 1991

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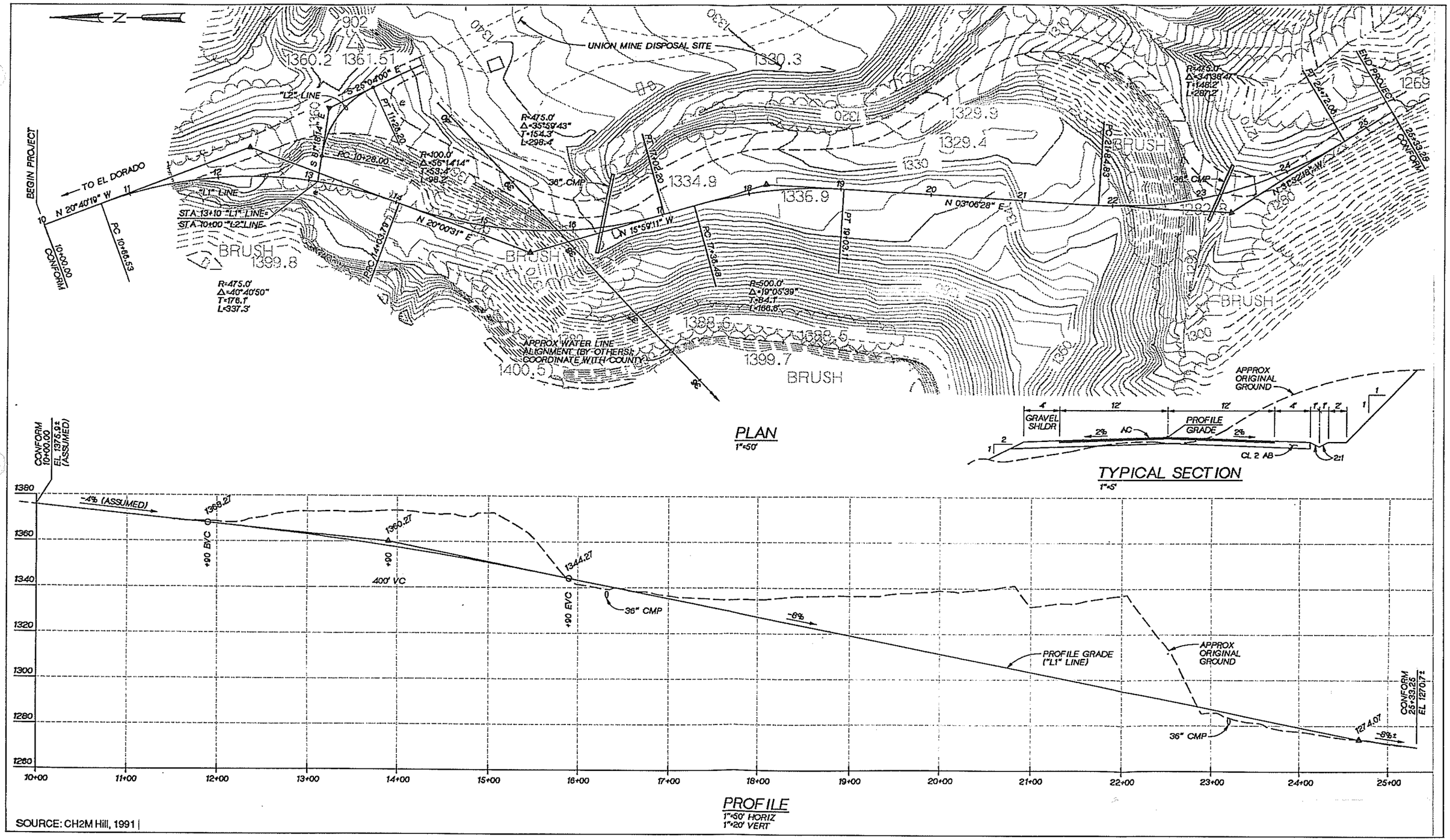
Leachate Collection System Layout

FIGURE 2-16



SOURCE: CH2M Hill, 1991

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Union Mine Road Realignment Schematic

FIGURE 2-17

and a series of settling ponds. Depending on the constituents of the leachate, additional processes may be required to treat the leachate prior to discharge to the Deer Creek WWTP collection system. Figure 2-18 shows a schematic layout that conceptually represents the treatment system. Design data for the biological treatment are presented in Table 2-4. The proposed treatment system would be designed using the information available at the time of final design. The quality and quantity of both leachate and septage are typically quite variable. As a result, the treatment facility would be designed to allow for modification or addition of unit processes as necessary to treat the leachate and septage actually received.

If the treated effluent is of sufficient quality, and meets the standards set forth by the El Dorado Irrigation District and the Regional Water Quality Control Board, it may be utilized at the landfill for dust control and other water spray uses. Using the treated effluent for landfill water needs would help conserve water and would reduce the cost of pumping the effluent to the EID collection system.

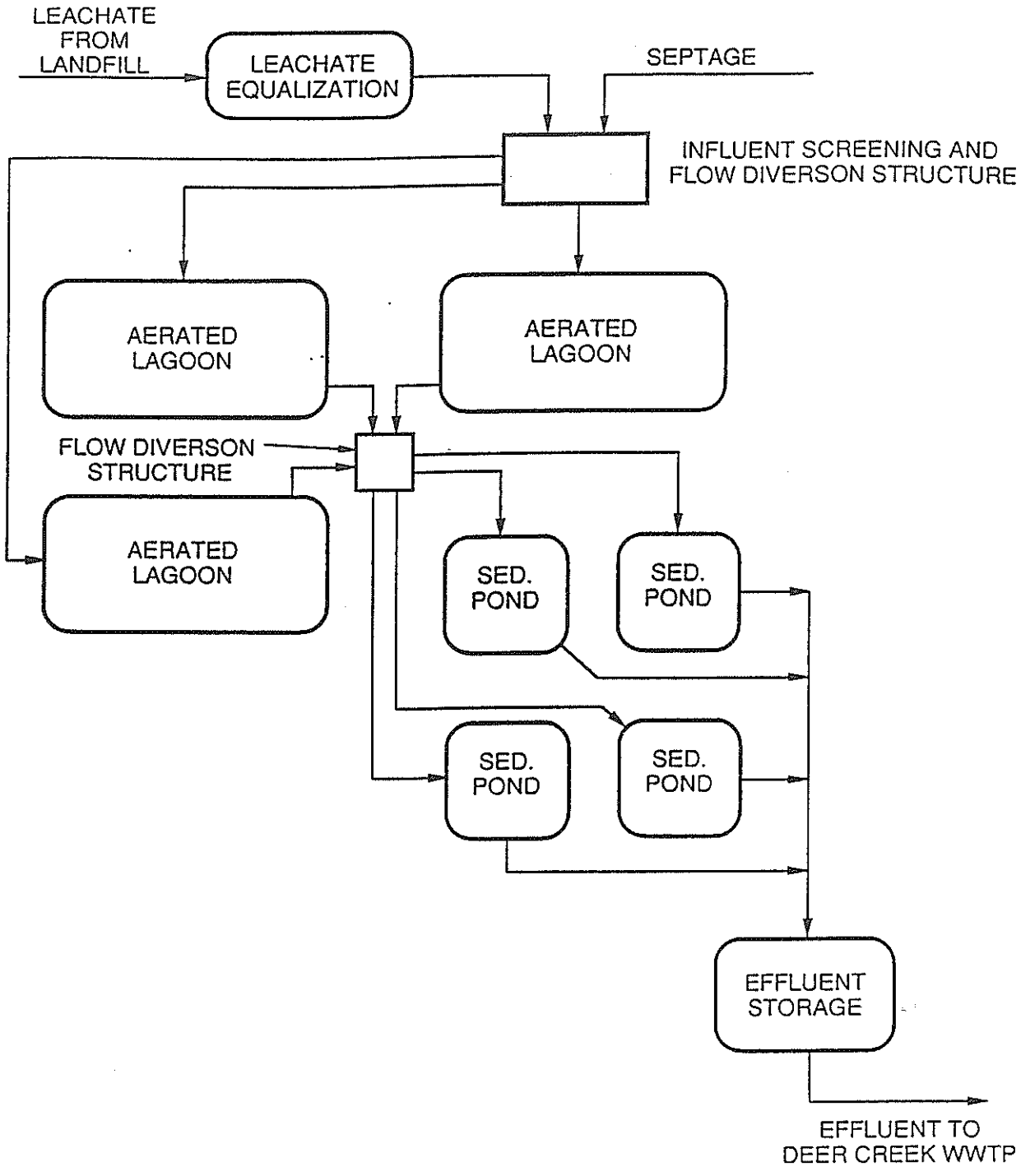
Table 2-4
BIOLOGICAL TREATMENT DESIGN DATA

Item	Size
Aerated Lagoons	Three - 110 feet by 250 feet by 8 feet deep Detention time = 30 days
Aerators	Eight - 30 horsepower aerators per lagoon
Settling Ponds	Four - 50 feet by 50 feet by 8 feet deep Detention time = 2 days

3. Landfill Closure

Description

Upon completion of refuse fill activities in each section of the landfill, the area would be closed, and final cover placed. The northern 17 acres of the existing landfill area would be closed first, estimated to occur in 1994–1995. The



SOURCE: CH_2M Hill 1991

ERCE

Schematic of Leachate/Septage Treatment Facility

FIGURE 2-18

expansion area and the southern 16-acre area of the existing fill would be closed together. The final closure elevations for the site are shown on Figure 2-5. The entire site would be revegetated with non-irrigated native vegetation. A post-closure maintenance program (as required by CCR Title 23 Chapter 15 Article 8) would be instituted at the landfill to verify that containment and monitoring facilities retain their integrity. Surface drainage control facilities, final vegetated soil cover areas, groundwater monitoring facilities, and leachate control facilities would be routinely evaluated. Cracks detected in the final cover would be sealed and any erosion damage would be repaired.

Construction Components

At closure, a minimum of two permanent survey monuments would be installed at the site by a state licensed land surveyor or registered civil engineer. The monuments would be placed so that the location and elevation of all units and monitoring facilities can be monitored throughout the post closure maintenance period. In accordance with 14 CCR 17767(f), at closure and at each 5-year increment thereafter, surveys would be conducted to map contour intervals and changes in grading patterns and settlement. Survey information would be filed with the El Dorado County Recorder.

Final Cover

State of California design requirements for final cover are contained in Title 23 CCR Chapter 15 and Title 14 CCR, Chapter 3, Article 7.8. In accordance with these requirements, the final cover for the existing landfill would consist of a 2-foot foundation layer consisting of compactable, non-decomposable materials obtained onsite, a 1-foot barrier layer of imported low-permeability soil with a hydraulic conductivity no greater than 1×10^{-6} cm/sec, and an additional 1 foot of native material for revegetation and protection of the barrier layer. The barrier layer soil would most likely consist of a mixture of native soil and imported clay from the Ione area.

Soft chess (*Bromus mullis L.*) and wheatgrass (*Agropyron trichophorum Link Richt.*) are plant species proposed to be used for the final revegetation. These varieties have a good tolerance for infertile soils and drought conditions and have

shallow root depths. The county plans to consult with the U.S. Soil Conservation Service or U.S. Forest Service prior to final design to determine the recommended time and rate of seeding for the grasses.

Placement of the final cover system and seeding would occur first on sections of the existing landfill. This work would start during the summer and be completed prior to the wet season (generally by mid-October). Where areas of the existing landfill would have additional solid waste place over them from the proposed expansion project, the steeper areas would be graded and a synthetic temporary cover placed to minimize infiltration. The flatter areas would have either a synthetic liner or a 1-foot-thick, 1×10^{-6} cm/sec permeability barrier layer installed to reduce erosion. All temporary areas consisting of soil areas would be seeded. The actual 4-foot final cover section would be placed when the expansion area has reached final grade.

Expansion and Closure Environmental Monitoring Program

The monitoring program developed for the Union Mine Disposal Site would meet Title 23 CCR, Chapter 15 requirements for detection monitoring. The program also addresses Title 14 CCR, Appendix 1 constituents for areas that would be closed during operation of the expansion area prior to final closure.

The monitoring program includes:

- Groundwater monitoring
- Vadose zone monitoring
- Surface-water monitoring
- Leachate monitoring
- Waste acceptance monitoring

The existing and proposed monitoring programs are described below.

Groundwater Monitoring

Existing Program. The existing groundwater monitoring program includes 10 wells and is intended to:

- Characterize background water quality. Background groundwater quality is being monitored in Wells UM-1 and UM-2. These wells are screened in unweathered fractured bedrock. Well UM-1 is located upgradient of the landfill, and Well UM-2 is located crossgradient to the site.

- Monitor the separation between waste and underlying groundwater. Monitoring Wells LW-1 and LW-2 were installed to monitor water levels in the existing fill. Groundwater levels are being monitored in the shallow weathered bedrock along the toe of the landfill in Wells MW-1 and MW-4.

- Evaluate the impact of the leachate on weathered and deep bedrock beneath and downgradient of the existing fill. Wells UM-3 and UM-4 monitor downgradient groundwater quality in the unweathered fractured bedrock, and monitoring Wells MW-1 through 4 monitor downgradient water quality in the near-surface weathered bedrock.

The well locations are shown in Figure 1-9. Monitoring Wells MW-3, MW-4, LW-1, and LW-2 were installed in 1990 to evaluate groundwater conditions at the site and to replace the wells that would be decommissioned during the southward expansion. All wells would be included in the existing monitoring program until they are decommissioned.

Expansion Program. Several of the existing monitoring wells would be decommissioned during the southward expansion. The wells would be abandoned in accordance with California Department of Water Resources guidelines. Two new wells will be added: one on the northern edge of the landfill and one on the eastern edge (refer to Figure 2-2). If the information supplied by the remaining and two additional wells does not satisfy the requirements of Title 23 CCR, Chapter 15, additional wells would be installed.

The sampling frequency and analyses for the expansion would be modified from current procedures to meet the requirements of RWQCB Monitoring and Reporting Program No. 88-149 and the CIWMB Title 14.

Vadose Zone Monitoring

Existing Program. The existing detection monitoring program does not include vadose zone monitoring.

Expansion Program. Groundwater levels below the expansion area would be controlled by a toe drain and a drain installed along the invert of the unnamed tributary to Martinez Creek. The area between the toe drain and invert drain would be covered with 5 feet of clean fill to provide a 5-foot separation between waste and groundwater. To monitor the effectiveness of these drains, at least three vibrating wire piezometers would be installed to monitor the hydrostatic pressure beneath the liner. The pressures in these piezometers would be recorded monthly.

Two suction lysimeters would also be installed beneath the retention basin (the Class II impoundment located along the toe of the expansion area). If sufficient water is obtained from these lysimeters to perform the proposed analyses, another lysimeter would be installed to obtain background soil-pore data.

The sampling frequency and analyses would meet the requirements of CIWMB Title 14.

Surface Water Monitoring

Existing Program. Seven existing surface-water stations located near the landfill are sampled quarterly. The approximate locations of the surface-water sampling stations are shown in Figure 1-9. The current sampling frequency and analyses meet the requirements of RWQCB Monitoring and Reporting Program No. 88-149.

Expansion Program. The existing surface-water monitoring program would be modified as soon as the toe drain and drain along the invert of the unnamed tributary are installed. The exact modifications to the surface water monitoring program are undetermined at this time. The sampling frequency and analysis

would then be modified to meet the requirements of RWQCB Monitoring and Reporting Program No. 88-149 and the CIWMB Title 14.

Leachate Monitoring

Existing Program. No leachate collection or removal system (LCRS) is currently in place at the Union Mine Disposal Site. Leachate is sampled from seeps when available. The sampling analyses meet the requirements of the RWQCB Monitoring and Reporting Program No. 88-149.

Expansion Program. The expansion area of the Union Mine Disposal Site would include an LCRS, a Class II impoundment, and a toe drain to intercept underflow from the existing landfill. The LCRS and toe drain would flow into a wet well and collected leachate would be pumped to the treatment facility.

Discharge from the LCRS, water from the Class II impoundment (retention basin), seepage from between the double liners beneath the impoundment, and discharge from the toe drain would be sampled to meet the requirements of RWQCB Monitoring and Reporting Program No. 88-149 and the CIWMB Title 14.

Waste Acceptance Monitoring

Existing Program. The County of El Dorado currently has a load screening program for hazardous waste implemented at the Union Mine Disposal Site. The load screening program consists of the following components:

- Signs are posted and leaflets distributed which identify those wastes considered hazardous, and state that those wastes cannot be disposed of at the landfill.

- Verbal entrance check with drivers to determine if their loads contain any hazardous wastes.

- Random load checking.

Expansion Program. The waste monitoring program will be continued with the proposed expansion; no new aspects to the plan are proposed to be implemented.

Preliminary Post-closure Maintenance Plan

A post-closure maintenance plan is currently being prepared for the Union Mine Disposal Site by CH_2M HILL in accordance with 23 CCR, Chapter 15 Article 8. This regulation requires that the post-closure maintenance period extend as long as the wastes pose a threat to water quality. The post-closure maintenance plan must be approved by the CIWMB. The following provides a general overview of the major components of the plan, with the exception of post-closure funding. If necessary, monitoring will be modified to comply with the requirements of the CIWMB.

Post-closure End Use

Following final closure of the landfill, the land would be maintained as non-irrigated open space. All structures not necessary to the environmental monitoring system during the post closure maintenance period would be removed. Access control fences would be installed around the site. Signs would be posted and maintained to discourage unauthorized access and warn of potential hazards. Following the successful establishment of grass cover in disturbed areas, livestock grazing may be managed on the property. Livestock would be excluded from areas that would interfere with environmental monitoring systems and from the landfill cap.

Monitoring and Control Systems

The monitoring and control systems (groundwater, leachate control, landfill gas, etc.) described in previous sections would be maintained during the post-closure maintenance period. No expansions to existing monitoring systems are planned at this time. Additional controls and systems may be added as needed during the operating, closure, and postclosure maintenance period.

Drainage System. The drainage system would consist of ditches, water diversion berms, and culverts. These would receive periodic visual inspections.

Final Cover Integrity and Grades. As discussed in the Closure Plan, grades would be monitored by field survey methods on the final cover to assure that surface water is effectively drained and that excessive settlement has not occurred. Integrity of the final cover would be field checked for animal burrows, erosions gullies, or other types of damage by walking or driving all portions of the area and making visual inspections. Areas with poor vegetative cover would be reseeded and remulched.

Damaged sections of the cap would be restored to their original condition by excavation of the damaged materials, placement of new engineered fill, and revegetation. If portions of the area undergo excessive settlement so that surface-water drainage is impaired, additional fill and vegetative cover soil would be placed to restore the grade to acceptable limits.

Groundwater Monitoring System. The condition of monitoring wells in the groundwater monitoring system is determined by personnel each time sampling takes place. This is done by visual inspection and observation of the performance of the well during purging and sample collection.

Leachate Control System. Portions of the proposed leachate collection and removal system for the expansion area accessible to inspection and maintenance include the pump station and pipelines. Cleanouts are designed for the ends of lateral lines and both ends of the main pipeline. The cleanouts would be available for flushing the lines if necessary; however, normal inspections would not include buried portions of the piping.

The leachate pump station would receive periodic inspection and maintenance by qualified maintenance personnel. This would include visual checks, electrical checks, pumping tests, and lubrication. Faulty equipment would be repaired or replaced.

Documentation. A record of all postclosure maintenance activities at the Union Mine Disposal Site would be maintained at the county office throughout the post

closure period. Maintenance performed would be logged and included in the records document for postclosure maintenance. Any emergency or special occurrence would also be recorded.