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APRIL 3, 1996

TO: BOARD OF DIRECTORS

FROM: JOSEPH E. DREW, CHIEF EXECUTIVE OFFICER

SUBJECT: METRO RED LINE MID-CITY EXTENSION: SUB-SURFACE EXPLORATIONS, PROPOSED NEXT STEPS AND AUTHORIZATION FOR EXPENDITURES (AFE)

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 Metropolitan
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 Authority

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RECOMMENDATION

It is recommended that the Board authorize:

- a) Evaluation of a potential Wilton/Arlington alignment (Attachment A) before proceeding further with the Mid-City Segment Supplemental Environmental Impact Statement/Subsequent Environmental Impact Report.
- b) An increase in the Engineering Management Consultants (EMC) AFE for Contract No. E0070, Contract Work Order No.38, in the amount of \$450,000 (Project No. 800087 only) to determine the engineering feasibility of a deep bored tunnel along a Wilton/Arlington alignment.
- c) An increase in the AFE for Contract No. EN027, Enviro-Rail, in the amount of \$150,000 (Project No. 800087 only), for a revised AFE amount of \$450,000, to provide geotechnical support for feasibility determination.
- d) Initiation of a procurement for professional services necessary to prepare a Mid-City Segment SEIS/SEIR which includes a Wilton/Arlington alternative, predicated on the engineering feasibility.

ORGANIZATIONAL IMPACT

The recommended actions are consistent with MTA plans. The Red Line Mid-City Segment is included in the MTA's Long Range Plan and is part of a Full Funding Grant Agreement (FFGA) with the Federal Transit Administration.

BUDGET IMPACT

There are sufficient funds in the FY96 budget, in 800087 (Red Line Western Extension) to conduct the feasibility determination.

ALTERNATIVES CONSIDERED

The Board could direct staff to analyze a Wilshire Boulevard alternative. At the Board's request, staff conducted additional sub-surface exploration along this

alignment and could undertake the same steps recommended for the Wilton/Arlington alignment. The MTA's Citizen Advisory Council April 1995 motion to add a Wilshire alternative to the SEIS/SEIR is also still pending. The engineering feasibility analysis would require an additional increase of the AFE by \$ 200,000 for EMC and by \$ 200,000 for Enviro-Rail. Since there remains a federal prohibition against tunneling through this area, expenditure to study this alternative has not been recommended by staff. The potential schedule impact is discussed in Attachment B.

The Board could also choose to circulate a Draft SEIS/SEIR with the two current Mid-City Segment alternatives, a Shallow Underground Stations and an Above Ground Stations, according to the schedule in Attachment B. Staff recommends against this since a number of serious community impacts have been identified for both alternatives (Attachment C).

DISCUSSION

The results of the recently completed geologic testing along Wilton/Arlington and Wilshire are summarized in Attachments D-G. No "fatal flaws" were identified in the preliminary geotechnical testing. Rather than circulate a Draft SEIS/SEIR document to the community at this time, staff is recommending that the two current alternatives be set aside while a possible deep bore alignment under Wilton/Arlington is developed further. This possible third alternative would serve the Mid-City area while avoiding many of the impacts identified for the other two alternatives. FTA officials have been advised of the staff proposal to pursue a Wilton/Arlington alternative and have emphasized the need to explore the feasibility as expeditiously as possible.

The recommended first step is to confirm the engineering feasibility of a Wilton/Arlington alignment. Staff proposes to reactivate the Tunnel Review Board (TRB) that was convened for the Mid-City Reassessment study. EMC would provide the necessary engineering support and Enviro-Rail would provide additional sub-surface testing. This process is anticipated to take four months. Once the feasibility of the alignment is established, staff will return to the Board for award of a competitively bid contract to prepare the SEIS/SEIR for the Wilton/Arlington alignment. This will require additional funds.

DBE PARTICIPATION

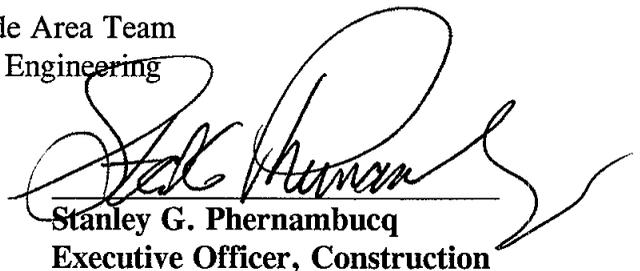
EMC's DBE/MBE/WBE goal is 27% and EMC has consistently achieved 30% or above. Enviro-Rail is committed to meeting a 30% DBE goal.

ATTACHMENTS

Prepared by: Ellen Gelbard, Project Manager Westside Area Team
James Givens, Deputy Project Manager Engineering



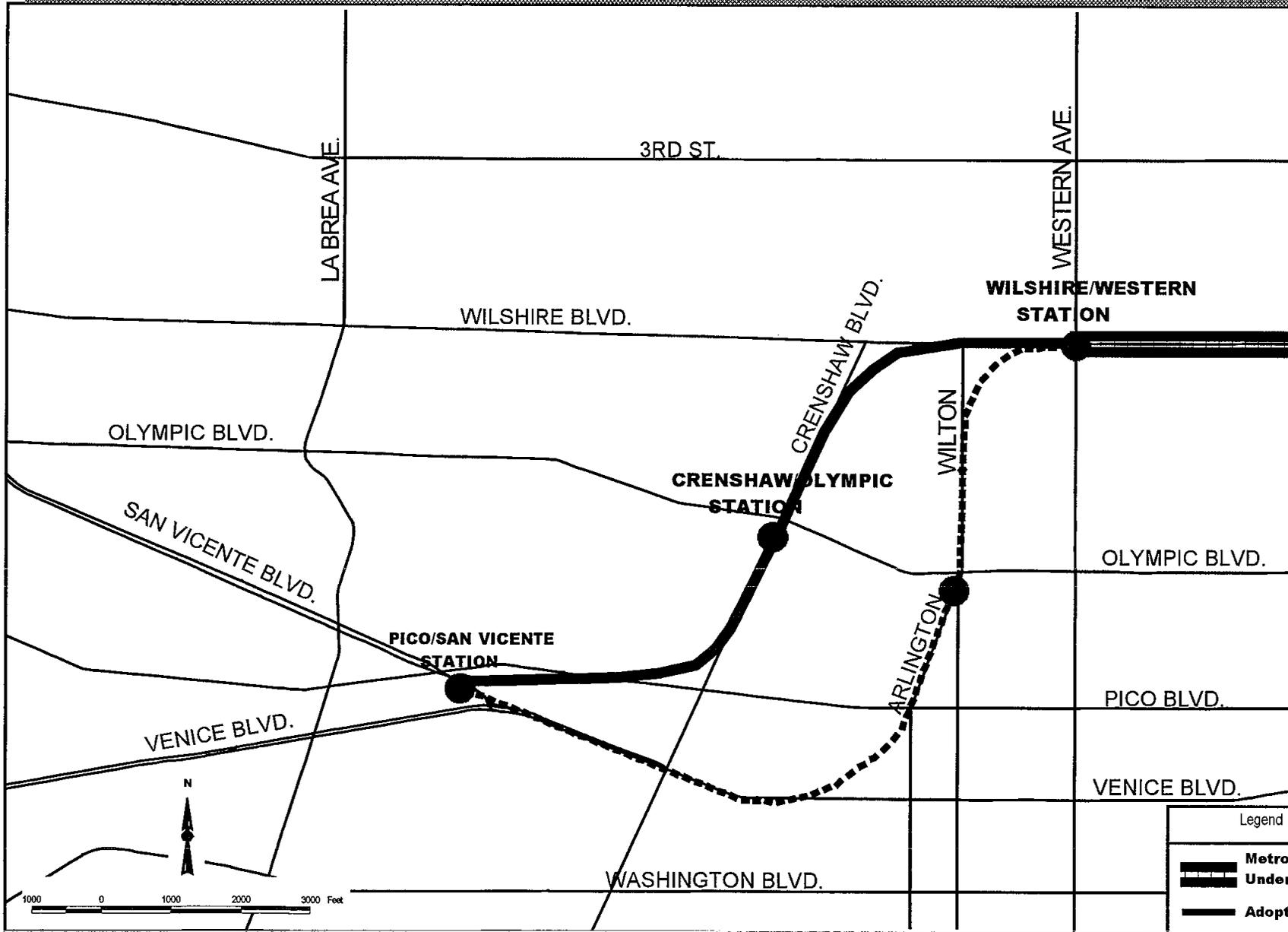
Patricia V. McLaughlin
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Red Line Mid City Segment

Los Angeles
County
Metropolitan
Transportation
Authority



ATTACHMENT 'A'

POTENTIAL MODIFIED ALIGNMENT

Legend

- Metro Red Line Under Construction
- Adopted Mid City Alignment
- Potential Modified Alignment
- Metro Rail Stations

ATTACHMENT B

Current Mid-City Segment Schedule

ID	Task Name	Duration	Start	Finish	Q2 '96			Q1 '97				Q1 '98				
					Q2 '96	Q3 '96	Q4 '96	Q2 '97	Q3 '97	Q4 '97	Q1 '98	Q2 '98	Q3 '98	Q4 '98	Q1 '99	Q2 '99
1	FTA Review	20d	Mon 4/29/96	Fri 5/24/96	■											
2	Circulate Draft SEIS/SEIR	45d	Mon 7/1/96	Fri 8/30/96		■										
3	Board selects LPA	0d	Wed 9/25/96	Wed 9/25/96			◆ 9/25									
4	Prepare Final SEIS/SEIR	103d	Wed 9/25/96	Fri 2/14/97			■									
5	Board adopts Final SEIR	0d	Wed 3/26/97	Wed 3/26/97					◆ 3/26							

Adjusted Mid-City Schedule: Additional Alternative

ID	Task Name	Duration	Start	Finish	Q2 '96			Q1 '97				Q1 '98	
					Q2 '96	Q3 '96	Q4 '96	Q2 '97	Q3 '97	Q4 '97	Q1 '98	Q2 '98	
1	Board Authorization	0d	Wed 4/24/96	Wed 4/24/96	◆ 4/24								
2	Finalize Engineering CWO	15d	Thu 4/25/96	Wed 5/15/96	■								
3	Engineering Analysis	80d	Thu 5/16/96	Wed 9/4/96		■							
4	Procure Environmental	80d	Mon 7/15/96	Fri 11/1/96			■						
5	Board Approves Procuremnt	0d	Wed 12/18/96	Wed 12/18/96					◆ 12/18				
6	Prepare Draft SEIS/SEIR (*)	80d	Wed 12/18/96	Tue 4/8/97				■					
7	FTA Review Draft	20d	Wed 4/9/97	Tue 5/6/97									
8	Circulate Draft SEIS/SEIR	45d	Wed 5/7/97	Tue 7/8/97									
9	Board Selects LPA	0d	Wed 8/27/97	Wed 8/27/97									
10	Prepare Final SEIS/SEIR	100d	Wed 8/27/97	Tue 1/13/98									
11	Board adopts Final SEIR	0d	Wed 2/25/98	Wed 2/25/98								◆ 2/25	

(*) If a Wilshire alternative were studied, the schedule for the environmental clearance would be lengthened. The FTA has stated that it is not likely to allow a SEIS document to be prepared for an alignment that can not be legally funded. A process of attempting to lift the federal ban against tunneling and the additional time required to prepare the federal environmental documentation, if the ban were lifted, would add time and uncertainty to the schedule.

**CHARACTERISTICS AND MAJOR IMPACTS OF
CURRENT "SHALLOW" MID-CITY ALIGNMENT ALTERNATIVES***

	<u>Underground Stations Alternative</u>	<u>Above Ground Stations Alternative</u>
Acquisitions		
Total Land	23 acres	38 acres
Land Available for Re-Use	8 acres	21 acres
Structures	18 single family 95 multi-family 25 non-residential	21 single family 227 multi-family 71 non-residential
Land Use	Residential property through neighborhoods (required for utility relocations) and block face on Crenshaw between Wilshire and 8 th Street left vacant after construction is completed. Reinvestment program would probably be necessary to encourage re-use.	Both sides of Crenshaw for a half mile in the vicinity of station, a block face on Crenshaw between Wilshire and 8 th Street, and several blocks on the south side of Pico left vacant after construction is completed. Reinvestment program would probably be necessary to encourage re-use. Pico/San Vincente site is cut in two by aerial structure and tail track, impairing joint development potential.
Visual		Aerial structures extend for one-quarter mile along Crenshaw and one-half mile along Pico, with maximum height reaching 40-50 feet.

**CHARACTERISTICS AND MAJOR IMPACTS OF
CURRENT "SHALLOW" MID-CITY ALIGNMENT ALTERNATIVES***

	<u>Underground Stations Alternative</u>	<u>Above Ground Stations Alternative</u>
Visual (Cont.)	Two 15-foot high vent structures (15x20 feet) would be required for tunnel sections; one on Wilshire and one on Pico.	Two 15-foot high vent structures (15x20 feet) would be required for tunnel sections; one on Wilshire and one on Pico.
Noise / Vibration	Residents may be able to detect train as it goes beneath homes. Some residential properties will require 15 foot soundwalls across backyards.	Residents may be able to detect train as it goes beneath homes. Some residential properties will require 15 foot soundwalls across backyards.
Construction Disruption	Three-quarter mile cut-and-cover construction along Crenshaw. Major utility relocations on private lots traversing residential neighborhoods. Shallow tunnels create potential for settlement under homes.	One-half mile of above ground structure in middle of Crenshaw, plus one quarter mile cut-and-cover north and south of structure. One-half mile aerial structure on property along Pico. Shallow tunnels create potential for settlement under homes.

*Both alternatives are determined to be safe and constructible. A comprehensive and exhaustive study was made to determine possible strategies to minimize impacts. Some of the strategies included urban design studies (Marc Futterman, February 1996, and Altoon Porter, March 1996) and examination of alignment adjustments that would minimize property acquisitions.

ATTACHMENT D

Mid-City Segment: Results of Recent Sub-Surface Gas Explorations

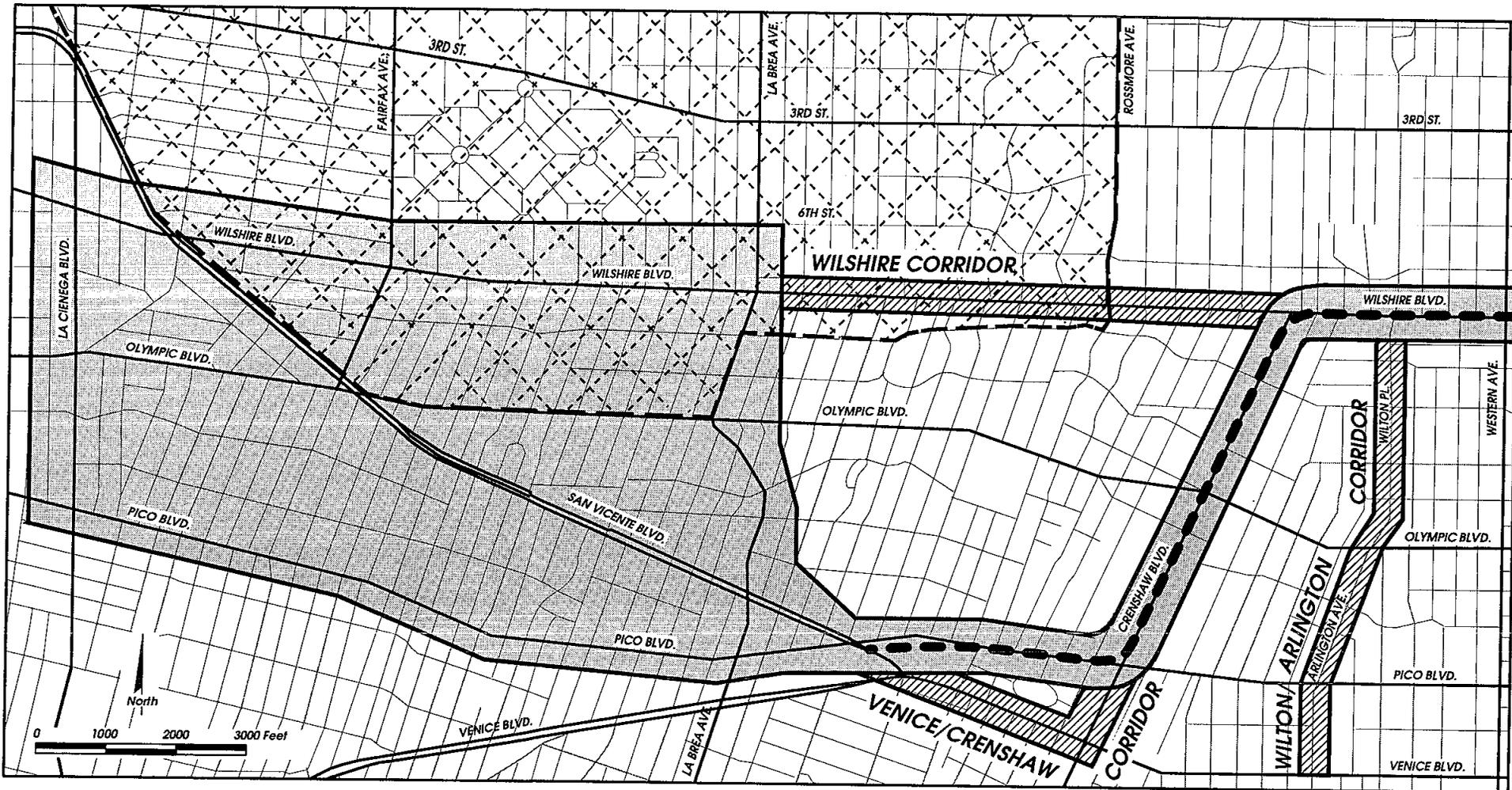
In November 1995, the Board authorized exploratory sub-surface borings in several locations within the Mid-City Segment vicinity. The attached map (Attachments E) identifies the study area and the previous sub-surface study phase. Attachments F-G summarize findings with regard to the levels of hydrogen sulfide (H₂S) detected, the presence of water and the depth of the San Pedro layer (the soil formation where concentrations of H₂S gas are typically found). Detailed information can be found in the Enivro-Rail reports completed in March 1996.

Wilton Place/Arlington Avenue/Venice Boulevard

- The area on Wilton between Wilshire and 8th Street was saturated with ground water and there were no accumulations of gas detected. Deep bore tunneling could be constructed through this section where the San Pedro is shallow and water-saturated. Dewatering would be required if MTA's standard tunneling techniques are utilized and treatment of the water for dissolved H₂S may be required prior to discharging.
- The highest level of H₂S gas found under Wilton/Arlington alignment was 20-90 parts per million(ppm) in an area between 8th Street and San Marino Place, north of Olympic Boulevard. This compares to over 10,000 ppm under Crenshaw Boulevard near Olympic.
- In the section between 8th Street and San Marino, the San Pedro is about 45 feet below the ground surface. This section would require additional engineering analysis to explore options for safely constructing and operating a deep bore tunnel through a short section of the San Pedro that contains low concentrations of H₂S gas.
- South of San Marino Place, the San Pedro Formation occurs at depths greater than 60 feet below the ground surface and conventional deep-bore tunnels could be constructed in the Lakewood Formation above the gassy San Pedro Formation.
- The findings along Venice pertain to the Wilton/Arlington alignment as an alternative way to approach the San Vicente site. The San Pedro Formation is generally deep (about 100 feet below ground surface) under Venice but becomes shallower as it approaches the San Vicente site. Previous borings detected 850 ppm of H₂S gas in the San Pedro Formation and 23 ppm in the overlying Lakewood/alluvium at the Pico/San Vicente site, which would necessitate a shallow or above ground station.

Wilshire Boulevard between Crenshaw and La Brea Boulevards

- Along Wilshire Boulevard, between Crenshaw and La Brea Boulevards, the San Pedro Formation occurs between approximately 35 to 60 feet below ground surface. This section was is saturated with ground water and there were no accumulations of gas detected. Deep bore tunneling could be constructed through this section where the San Pedro is shallow and water-saturated. Dewatering would be required if MTA's standard tunneling techniques are utilized and treatment of the water for dissolved H₂S may be required prior to discharging.
- A Phase II sub-surface investigation that was reported to the Board in July 1995, covering the area between La Brea and La Cienega, identified concentrations of H₂S gas of 600 and 1,000 ppm in the areas of Hauser and Fairfax, respectively. Gas pressure exceeding 5 pounds per square inch (psi) was also identified near Fairfax. Engineering analysis of this section would help evaluate the feasibility of either a very shallow tunnel or a very deep tunnel under Wilshire.



LEGEND

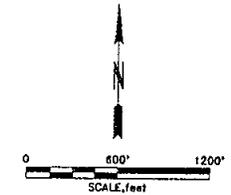
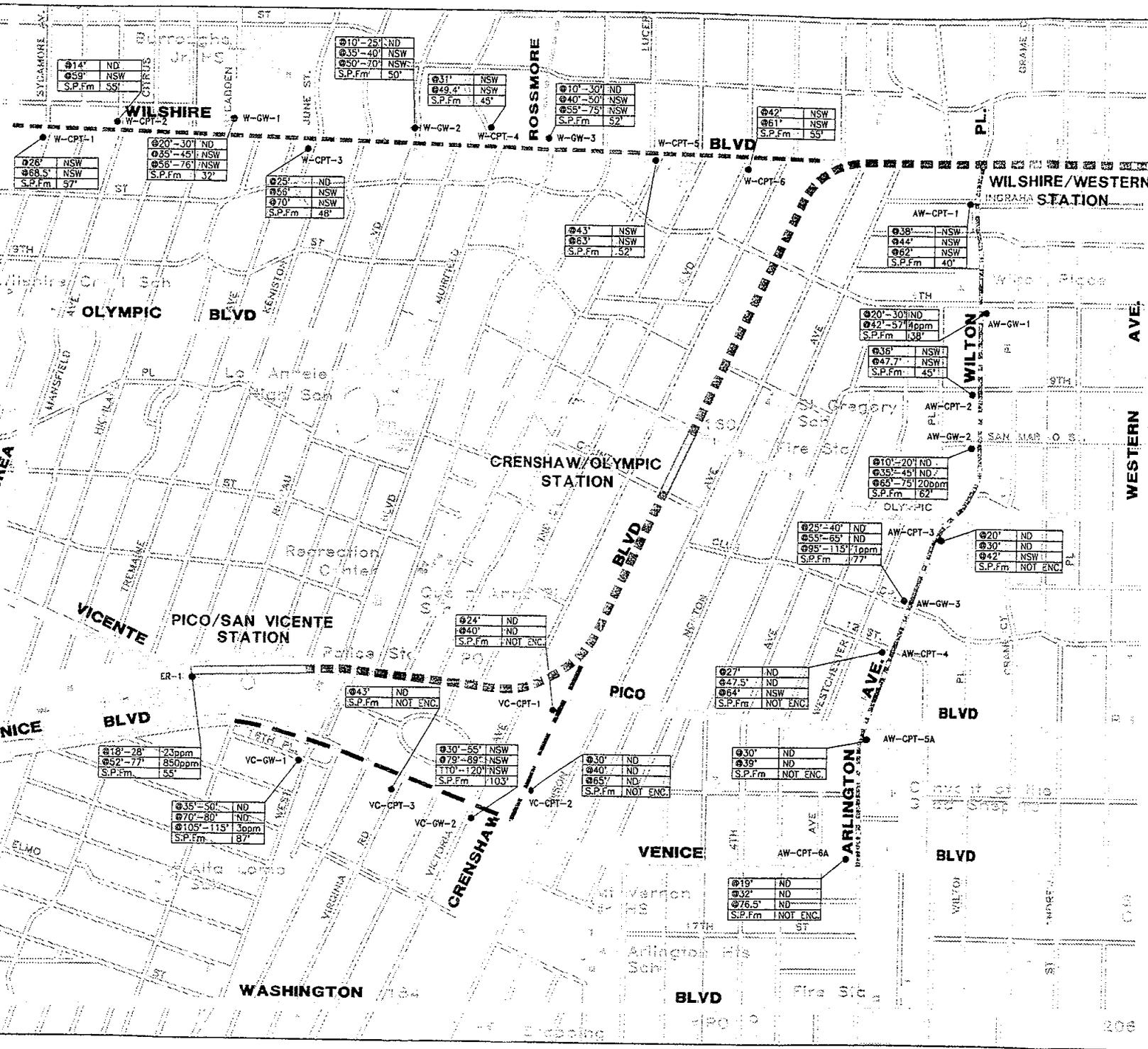
-  Adopted Mid-City Alignment
-  New Test Corridors
-  Previously Tested Area
-  Methane Prohibition Zone



ATTACHMENT E

**RED LINE MID-CITY SEGMENT AND WESTERN EXTENSION
ALTERNATIVE ALIGNMENT GAS TEST CORRIDORS**

ATTACHMENT F

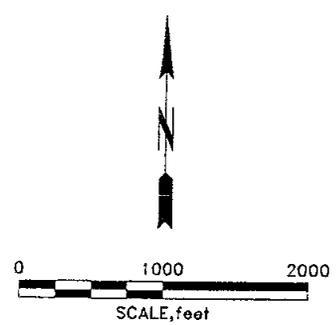
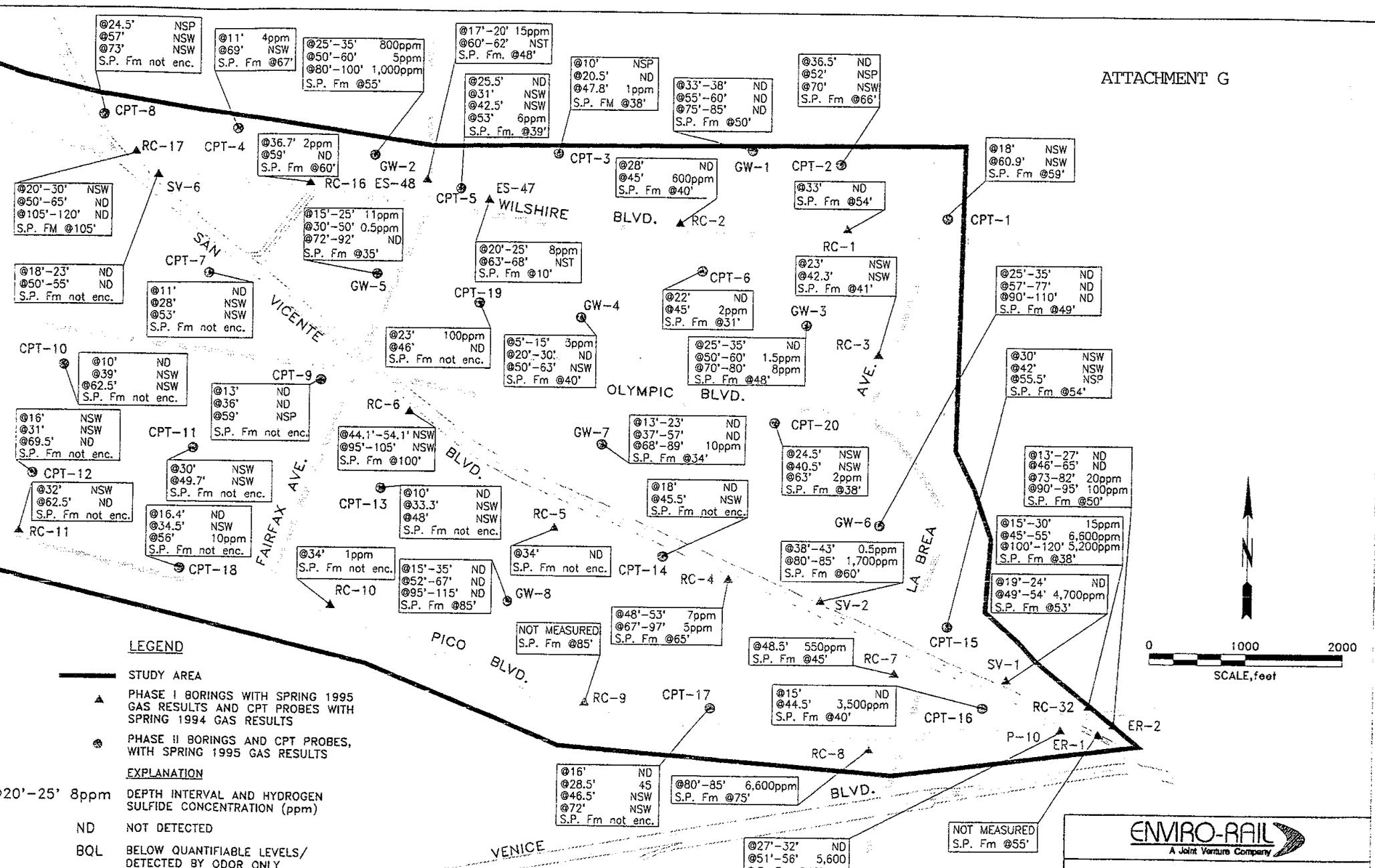


- LEGEND**
- WILSHIRE ALIGNMENT
 - WILTON/ARLINGTON ALIGNMENT
 - VENICE/CRENSHAW ALIGNMENT
 - EXISTING MID-CITY ALIGNMENT
- EXPLANATION**
- ②5'-30' 10ppm DEPTH INTERVAL/HYDROGEN SULFIDE CONCENTRATION (ppm)
 - ND NOT DETECTED
 - NSW NO SAMPLE DUE TO HIGH GROUNDWATER LEVEL
 - NST NO SAMPLE DUE TO TAR SANDS
 - NM NOT MEASURED
 - S.P. Fm@ DEPTH TO TOP OF SAN PEDRO FORMATION

ENVIRO-RAIL
A SCS Vertum Company

GAS WELLS & PROBES WITH HYDROGEN SULFIDE CONCENTRATIONS

Proj. No.: 964P008	Date: MAR, 1996
Project: MTA	CAD ID: WP-H2S
	Figure: 3



LEGEND

- STUDY AREA
- ▲ PHASE I BORINGS WITH SPRING 1995 GAS RESULTS AND CPT PROBES WITH SPRING 1994 GAS RESULTS
- PHASE II BORINGS AND CPT PROBES, WITH SPRING 1995 GAS RESULTS

EXPLANATION

- @20'-25' 8ppm DEPTH INTERVAL AND HYDROGEN SULFIDE CONCENTRATION (ppm)
- ND NOT DETECTED
- BQL BELOW QUANTIFIABLE LEVELS/ DETECTED BY ODOR ONLY
- NSW NO SAMPLE DUE TO HIGH GROUNDWATER LEVEL
- NSP NO SAMPLE DUE TO LOW PERMEABILITY OF SOIL LAYER AT FILTER DEPTH
- NST NO SAMPLE DUE TO TAR
- S.P. Fm@ DEPTH TO TOP OF SAN PEDRO FORMATION

ENVIRO-RAIL
A Joint Venture Company

**PHASE I AND II
GAS WELLS AND PROBES WITH
HYDROGEN SULFIDE CONC.**

Proj. No.: 924W325J	Date: MARCH 1996
Project:	CAD ID.: WE-12HS4
MTA	Figure: 2-2