SECTION 1: INTRODUCTION

Natural and man-made disasters result in losses of life and property, economic and social setbacks, and the destruction of the environment. Local governments are charged with the responsibility of protecting their residents from danger and harm. The Safety Element is intended to guide development by reducing the levels of risk posed by natural and man-made hazards within the City and its Planning Area.

Some degree of risk is inevitable since natural disasters cannot be predicted with certainty, and because the knowledge and technology to control man-made risks is constantly evolving. Since the total elimination of risk is not possible, public safety is relative to the degree of risk that people find tolerable. The value of life and property becomes a yardstick for tolerance and the need for governmental action.

The Safety Element presents a plan for minimizing the hazards to public health and safety. It outlines natural and man-made hazards that affect existing and future development, and provides guidelines for protecting residents from injury and death. It identifies present conditions and public concerns, sets policies and standards for improved public safety, and plans for protection from potential disasters. It seeks to minimize physical harm, as well as economic and social disruptions. The goals and objectives of the Safety Element reflect the community's regard for the health and safety of its residents. The Element addresses issues which the entire community believes would require government intervention in order to effectively achieve public safety. The purposes and goals of the other elements go hand-in-hand with the goals of the Safety Element. Together, they will serve as a guide for decision-making by public and private investors and for the future expenditure of public funds.

Specifically, the Safety Element serves the following purposes:

1. As one of the state-mandated elements, it fulfills the requirements of the State Planning and Zoning Law and the regulations in Section 65302(g) of the Government Code of the State of California.

2. The Element informs the public of public safety goals, objectives, and policies of the City for development until 2010. It provides a comprehensive risk management program to serve as a guide for the day-to-day operational decisions of City staff.

3. The Element evaluates the seismic, flood, geologic, wildfire, and urban fire hazards in the Planning Area, as well as aircraft accident potential, hazardous materials, and crime. It seeks to eliminate or reduce the risks to public safety through planning for the prevention of hazardous situations and for the provision of adequate emergency services.

SECTION 2: GOALS, OBJECTIVES, AND POLICIES

GOAL S1: Minimize danger and damage to public health, safety, and welfare resulting from natural hazards.

Objective S1.1: Review development within or adjacent to geologic hazards, to ensure adequate provisions for public safety.

Policy S1.1.1: Provide copies of geotechnical reports for projects located within the seismic hazard zone, as shown on latest California Department of Conservation Seismic Hazard Zones Map, to the State Division of Mines and Geology. *(General Plan Amendment 04-01, adopted by City Council April 14, 2004.)*

Policy S1.1.2: Assist developers in obtaining necessary technical and policy information regarding seismic hazards.

Policy S1.1.3: Require geotechnical studies, to be reviewed and approved by the City's geologist, for development proposals in areas where geotechnical hazards may be present, and implement the recommendations of those reports as deemed necessary by the City.

Policy S1.1.4: Require appropriate structural setbacks from active fault rupture traces in accordance with Alquist-Priolo standards and as required by the City, based on geotechnical analysis.

Policy S1.1.5: Require structural setbacks or special foundations for structures within potentially active fault zones as determined by the City, based on geotechnical analysis.

Policy S1.1.6: Require special foundations within inactive fault zones if determined necessary by the City.

Policy S1.1.7: Restrict location of utility lines, whether above or below ground, within an appropriate distance from active fault traces, as determined by geotechnical investigation and approved by the City. Utility lines crossing active fault traces should be specifically designed to withstand the expected movement of the earth in these locations. Utility lines as defined here would include, but not be limited to, electricity, water, natural gas and sewer.

Policy S1.1.8: Require that all structures should meet or exceed state required earthquake resistant design standards.

Policy S1.1.9: Review development proposals located in or immediately adjacent to areas of soil instability, liquefaction areas, and steep slopes to determine if a significant constraint exists and to determine appropriate land use or hazard mitigation methods, and require compliance with any such measures identified.

Policy S1.1.10: Develop and adopt hillside grading standards to minimize the hazards of erosion and slope failure.

Objective S1.2: Minimize hazards associated with flood plains in the area.

Policy S1.2.1: Require that new development shall not be exposed to flood hazards or contribute to an existing flood hazard, in accordance with the City's Floodplain Management Ordinance and related criteria within the City's Engineering Design Standards.

Policy S1.2.2: Require that building foundations be a minimum of one (1) foot above the 100-year flood elevation, unless alternative diversion methods are approved by the City Engineer.

Policy S1.2.3: Require that grading of floodways shall be in a manner which allows for groundwater recharge and protection of projects from flooding.

Policy S1.2.4: All required primary and secondary access and egress routes for all new development should be "dry" access located outside of the 100-year flood plain.

Policy S1.2.5: Consider the operability of natural gas, electric, water and sewer services during the occurrence of flooding in review of project design.

Policy S1.2.6: Require that grading and other methods of water diversion be used to retard water runoff, where appropriate.

Policy S1.2.7: Ensure that storm water drainage is designed for peak flow conditions.

Policy S1.2.8: Ensure that new development complies with floodplain zoning and watershed management regulations.

Policy S1.2.9: Preserve and restore the natural and beneficial values served by floodplains to the extent feasible, consistent with public health, safety and welfare.

Policy S1.2.10: Promote open space and recreational uses in designated flood zones, unless mitigation of the hazard can allow other types of development.

Policy S1.2.11: Implement the City's Master Drainage Plan, through the development review process and capital improvement program.

Policy S1.2.12: Monitor and require continued maintenance of drainage basins throughout the City to ensure maximum flood protection from existing facilities and prevent downstream flood hazards.

Policy S1.2.13: Implement public financing programs where feasible, to provide for required drainage improvements, and coordinate design and construction of flood control improvements with adjacent jurisdictions where appropriate.

Policy S1.2.14: Ensure that development near National Forest lands does not result in increased flows of water or debris on to forest land.

Objective S1.3: Ensure compatible development in areas within or adjacent to natural high fire risk areas (urban-wildland interface), and other high fire risk areas.

Policy S1.3.1: Ensure that structural setbacks from fire-prone vegetation for buildings near the National Forest are maintained in accordance with the standards and regulations established by the National Forest Service. Require that all necessary fire clearances be provided on private (not public) land.

Policy S1.3.2: Encourage dual access, particularly in mountainous and high fire risk areas, on approved all-weather surface roadways.

Policy S1.3.3: Provide fire-resistant landscaped buffer zones between high risk fire hazard areas and urban development, and restrict access from development into the open space areas during periods of high fire risk.

Policy S1.3.4: Evaluate the need for fire resistant landscape buffer zones for existing developments located in high risk fire hazard areas, and require fuel modification on a continuous basis where appropriate.

Policy S1.3.5: Require that all new development proposals near the designated wildfire hazard zones identify evacuation/emergency routes, and that the information be provided to all residents within the development.

Policy S1.3.6: Where appropriate, require preparation of a Fire Protection/Fuel Management Plan for new urban development adjacent to natural high fire hazard areas, and ensure implementation of fire hazard mitigation measures.

Policy S1.3.7: Where feasible, require new development to pay for fire protection services and facilities needed to support it.

Policy S1.3.8: Coordinate fire prevention and protection service needs and facility planning with Los Angeles County Fire District.

Policy S1.3.9: Ensure that the requirements of the Los Angeles County Fire Department are implemented on new development proposals, through the review process.

Policy S1.3.10: Require that all new development is served by a water system that meets the fire flow requirements established by the fire department.

GOAL S2: Minimize damage associated with man-made hazards.

Objective S2.1: Minimize damage from catastrophic failure of infrastructure.

Policy S2.1.1: Evaluate potential hazards associated with rupture of the California Aqueduct, to ensure that development in areas threatened with inundation are designed to minimize the threat to life and property.

Policy S2.1.2: Evaluate the potential for inundation from failure of the Lake Palmdale or Littlerock dams when reviewing development proposals within potential inundation areas.

Policy S2.1.3: Evaluate potential hazards associated with detention basin facilities, water main or reservoir rupture and minimize possible threat of inundation to life and property through design measures applied during the development review process.

Policy S2.1.4: Require that development in areas near high-pressure natural gas lines be buffered from them and provided with alternative access/evacuation routes.

Objective S2.2: Minimize damage resulting from aircraft accidents.

Policy S2.2.1: Require all development to be consistent with Department of Defense regulations as outlined in the Air Force Plant 42 Air Installation

Compatibility Use Zone (AICUZ) Report and to comply with applicable FAA regulations which affect development in the Accident Potential Zones. *(General Plan Amendment 04-01, adopted by City Council April 14, 2004.)*

Policy S2.2.2: Through the design review process, ensure that new buildings are located in a manner which will promote clear linear corridors through the developed area within any Accident Potential Zones, to create potential pilot options in the event of an aircraft emergency.

Policy S2.2.3: Review and evaluate currently existing areas within the low altitude overflight area, as shown on Exhibit S-17, which are occupied by incompatible uses, to determine the potential of the redevelopment process to convert those land uses to airport compatible uses. *(General Plan Amendment 04-01, adopted by City Council April 14, 2004.)*

Objective S2.3: Protect the public from hazardous materials and the hazards associated with the transport, storage or disposal of such materials.

Policy S2.3.1: Coordinate with Los Angeles County Fire Department to develop a listing of all hazardous waste generators that could affect City residents.

Policy S2.3.2: Continue to support and encourage state, City and county efforts to identify existing or previously existing hazardous waste generators or contaminated sites.

Policy S2.3.3: Require that soils containing toxic or hazardous substances be cleaned up to the satisfaction of the agency having jurisdiction, prior to the granting of any permits for new development.

Policy S2.3.4: Restrict or prohibit land uses and activities that generate excessive amounts of hazardous materials or wastes that cannot be properly maintained or disposed.

Policy S2.3.5: Promote the routing of vehicles carrying potentially hazardous materials along transportation corridors that reduce the risk to the public and sensitive environmental areas. Cooperate with regional agencies in developing such routing systems.

Policy S2.3.6: Require that all proposed hazardous waste facilities comply with the City's hazardous waste management plan and Chapter 9 Article 96 (hazardous Waste Facilities) of the Palmdale Zoning Ordinance. *(General Plan Amendment 04-01, adopted by City Council April 14, 2004.)*

Policy S2.3.7: Review proposed development in proximity to any existing or proposed hazardous waste facility, to ensure that future development and land use decisions consider and incorporate site design, setbacks and buffering techniques appropriate for the site and provide adequate mitigation of any potential adverse impacts to such development from hazardous waste facilities.

Objective S2.4: Ensure that development of a federal, state, or county prison in Palmdale shall not impact the health, safety, and lifestyle of residents.

Policy S2.4.1: Require that no jail, prison, or penitentiary facility or ancillary facilities shall be located either in residential areas or within 5 miles of a school, with the exception of a sheriff's station or substation. *(General Plan Amendment 04-01, adopted by City Council April 14, 2004.)*

Policy S2.4.2: Ensure that access to jail or prison facilities is not through residential areas, to the extent feasible.

Policy S2.4.3: Review the design and location of any jail or prison facility to ensure that it: (1) affords maximum protection to surrounding areas; (2) presents an attractive appearance compatible with surrounding development; and (3) that all related facilities are located on the same site.

Objective S2.5: Minimize potential hazards related to crime through the development review process and through on-going public education programs.

Policy S2.5.1: Through the development review process, ensure that sites are designed so as to maximize safety and security of users. Site design should consider the following factors, at a minimum:

1. Visibility of user areas from the public right of way and/or adjacent properties;

2. Lighting of user areas;

3. Accessibility for patrol and emergency vehicles;

4. Legible street numbers from both front and rear, where appropriate;

5. Use of open fencing where needed for site visibility;

6. Avoidance of dead ends or tunnel-like passageways in the pedestrian circulation system;

7. Visibility of parking areas by site users and/or the public right-of-way;

8. Use and maintenance of appropriate landscaping to maintain visibility and accessibility;

9. Security fencing to prevent trespass;

10. Prohibition of exterior ladders to permit roof access by trespassers;

11. Siting of laundry rooms, play areas and other accessory uses for maximum visibility and security; and

12. Designation of "defensible space" within project areas for site users.

Policy S2.5.2: Require all commercial and industrial projects to provide adequate lighting for buildings and parking areas, and visibility for patrol vehicles, to assist in law enforcement surveillance.

Policy S2.5.3: Where appropriate, require provisions of security within new developments on a continuing basis.

Policy S2.5.4: Encourage the formation and continued education of neighborhood and business watch groups, to assist the Sheriff Department in crime prevention and detection.

Objective S2.6: Minimize exposure of residents to other man-made hazards, to the extent feasible.

Policy S2.6.1: If, in the future conclusive evidence links electro magnetic fields (EMF) associated with electrical distribution lines, electrical distribution stations, or transformers with deleterious health effects, develop standards for construction, building setbacks, and/or land use restrictions for those areas impacted by hazardous EMF fields. *(General Plan Amendment 04-01, adopted by City Council April 14, 2004.)*

Policy S2.6.2: To the extent permitted by law, work cooperatively with the applicable agencies and homeowners to eliminate/modify sources which interfere or disrupt emergency communications including, but not limited to, improperly installed or operated Ham and citizen band radios.

GOAL S3: Maintain and enhance City emergency services.

Objective S3.1: Prepare the Palmdale community to be self-sufficient in the event of an emergency.

Policy S3.1.1: Ensure that there is not a reduction in effectiveness of emergency services as a result of growth permitted through the implementation of this plan.

Policy S3.1.2: Develop and implement a plan in cooperation with hospitals, schools, major businesses, utilities, the Red Cross, churches and other service providers to work together and train in preparation for a coordinated response during a major event.

Policy S3.1.3: Periodically, but not less than annually, review emergency service equipment and shelters to ensure that they are adequate to meet the needs of changing land uses and development types.

Policy S3.1.4: Consider the City's daytime and permanent population in determining emergency service needs.

Policy S3.1.5: Require all residents to maintain visible and clearly legible signs and street numbers to shorten the response time of emergency personnel.

Policy S3.1.6: Require City staff to undergo regular disaster preparedness training.

Policy S3.1.7: Maintain and implement the City's adopted Disaster Preparedness Plan.

GOAL S4: Protect public safety through the implementation and enforcement of City Ordinances and through public education.

Objective S4.1: Develop, implement and enforce City Codes to insure safe and sanitary living and working conditions throughout the City.

Policy S4.1.1: Adopt appropriate Codes to assure minimum standards to safeguard health, safety and public welfare by regulating the use and occupancy, location and maintenance of structures within the City.

Policy S4.1.2: Coordinate with other agencies (including but not limited to Los Angeles County Department of Health, Los Angeles County Fire Department, Regional Water Quality Control Board) to require correction of unsafe conditions.

Policy S4.1.3: Promote the upkeep and proper maintenance of the City's housing stock and other structures and properties through the establishment and enforcement of building maintenance standards for purposes of protecting the health, safety and welfare of the public.

Objective S4.2: Support the development and continued updating of public education programs on health and safety.

Policy S4.2.1: Prepare and disseminate educational information to residents and businesses on preparing for response to hazards of the area, including major earthquake, floods, hazardous waste spills, wildfire, etc.

Policy S4.2.2: Encourage and assist the school districts in teaching children to respond appropriately in an emergency, especially to situations unique to a desert environment. Such training should be repeated regularly to ensure that each child knows what to do in case of heat stroke, snake bites, floods, earthquakes, etc.

Policy S4.2.3: Promote the use of emergency water supplies or water filtration systems at point-of-delivery for acceptable water quality in emergency situations. *(General Plan Amendment 04-01, adopted by City Council April 14, 2004.)*

SECTION 3: IMPLEMENTATION

Until such time as the accurate prediction of natural phenomena is achieved and human actions are controllable, hazards are best avoided, mitigated with reinforced protection measures, prevented from compounding effects, and planned for. The implementation section of the Safety Element is concerned with strategies, programs, and ordinances that will be effective in achieving the goals, objectives, and policies contained in the previous section of this Element. The implementation measures are categorized as follows:

- Public Safety Programs
- Public Safety Standards
- Land Use Planning

These measures, taken together, will implement the public safety goals of the City.

A. Public Safety Programs

Public safety programs are aimed at mitigating unacceptable risks where government action is necessary for public safety. Hazard elimination means the removal of existing and potential hazards. As this course is not always possible, precaution and preparedness are necessary. The public safety policies recommend a number of programs that will reduce the loss of life, injury, and property damage in the event of a disaster. These programs focus on educating the public concerning the proper procedures for avoiding hazards; the need for increased emergency preparedness; and prevention or mitigation of existing and potential hazards.

Emergency preparedness means the awareness of existing and potential hazards and the adoption of mitigation measures to preserve public health and safety. The City's policy is to give first priority to saving human lives, and to reduce property damage, second. The City also seeks to eliminate a hazard, reduce the risks if the hazard cannot be eliminated or avoided; but above all, to plan for any potential disasters. Criteria for the allocation of public funds for various safety programs will determine priorities and facilitate implementation. Both private and public funds and resources will be solicited for these programs.

1. Existing Hazardous Buildings

The City will develop an inventory of existing hazardous buildings (structures highly susceptible to earthquakes, flood, fire, and other hazards). Existing structures may be required to be improved up to current safety codes before any change of occupancy or use is allowed.

2. Relocation/Rehabilitation Program

The City will study the need to develop a relocation/demolition/rehabilitation program to remove or reduce threats to life and safety associated with known hazardous structures. All available funding resources will be pursued to implement this program. If necessary, relocation assistance will be provided for dependent populations that may presently occupy these buildings.

3. Geologic Investigation

The City Engineering Geologist will evaluate the need for a geologic investigation for proposed development within areas of potential geologic hazards. Geologic investigations will be required to include assessment of soil stability, susceptibility to geologic hazards in the area, and any other conditions which, as determined by the City Geologist/City Engineer, may affect structural foundations.

4. Construction and Land Use Standards

The City will review all new development for compliance with construction and land use standards regarding earthquake, fire, aircraft accident, and other hazards. Strict enforcement of building codes and development standards shall be maintained with modifications granted only if no risks to life and property are involved.

5. Special Study Zones

The City has established special study zones in known hazardous areas (earthquake fault zones, flood hazard areas, and areas of steep slopes) in order to identify the need for in depth studies before allowing development within these areas (See Exhibit LU-4.) The construction of high density uses and critical structures on hazardous sites will be limited as required by California state law and City ordinances.

6. Volunteers

The City will offer training programs for people interested in volunteering during emergency preparedness/response activities so that during major disasters, these volunteers are organized and prepared. This program will allow the City to reach out to residents and inform them of ways they can prepare and help others during disasters. The program could also provide additional manpower to City and County agencies in abating or responding to an emergency.

7. Emergency Management

Public officials will be encouraged to attend seminars dealing with emergency management. Better trained leaders will provide the City with the best knowledge to deal with emergency situations. The City will ensure that emergency service providers are competently trained and have adequate resources to respond to the demands of a major disaster.

8. Public Information and Education

The City will develop programs for public information and the education of residents and businesses on earthquake safety, hazardous materials, aircraft accident, fire prevention, flood hazards, crime, dam inundation, geologic hazards, and other issues for which prevention measures may decrease the potential for personal injury and property damage.

9. City Emergency Preparedness Plan

The City has adopted an Emergency Preparedness Plan which identifies emergency responses and recovery operations for disaster occurrences affecting the City. The City will update these procedures at least every five years to accommodate growth and changing situations and to reinform responsible agencies of their specific roles. Resource listings within the City Emergency Preparedness Plan will be updated annually. The City's emergency plan includes disaster recovery programs and reconstruction standards and measures as well as the following information.

- **Evacuation Procedures/Routes**--The City will coordinate with the Office of Emergency Services, the Sheriff's Department, and local fire stations in establishing evacuation procedures in the Planning Area. Exhibit S-1 identifies major streets which may serve as evacuation routes.

- **Emergency Drills**--The City's Disaster Preparedness Coordinator will conduct drills each year. These drills will keep both public and private agencies informed of general safety procedures and individual responsibilities. Also, emergency training exercises with state and regional agencies shall be conducted.

- **Monitoring and Warning System**--The City will continually review its warning and public information system, which will facilitate communication during disasters. The public shall be informed of these warning systems to allow prompt and timely responses.

- **Resource Listing**--The City will update its list of resources and individual responsibilities every year to maintain emergency preparedness.

10. Emergency Shelters

Various natural and man-made disasters could affect the residents of Palmdale. Potential disasters include a major earthquake, hazardous materials incident, flooding, dam failure, national security emergency, transportation incident, and major fires in either the wildland or urban areas. In the event of a disaster, local officials and the Emergency Preparedness Coordinator, in conjunction with the Antelope Valley Chapter of the Red Cross need to assess the requirements for mass shelter and feeding.

The City's Emergency Preparedness Coordinator has the responsibility for organizing an emergency response plan as required by the State Office of Emergency Services (OES). This multi-hazard emergency plan addresses the City's preparedness response, recovery, and mitigation in the event of an emergency. The City's plan designates the Red Cross as the official disaster relief agency and arranges for other organizations, such as the Salvation Army to assist in disaster relief efforts.

Besides developing the City's multi-hazard emergency plan, the Emergency Preparedness Coordinator is also responsible for locating suitable facilities for shelter and making arrangements with the owners of these facilities for use in the event of a disaster. Such ideal facilities are schools, as they are public facilities and can accommodate a large number of people. Additionally, churches and commercial lodging facilities such as motels and hotels could be employed as needed.

Table S-1 below lists potential care and shelter supporting organizations that might be employed in the event of a disaster. These facilities are depicted on Exhibit S-2.

TABLE S-1

CARE AND SHELTER SUPPORTING ORGANIZATIONS

American Red Cross Antelope Valley Chapter	Red Cross liaison *(General Plan Amendment 04-01, adopted by City Council April 14, 2004.)*
Salvation Army Lancaster Office	Personnel/supplies/equipment
Palmdale School District	Shelter site
Westside School District	Shelter site
Antelope Valley High School District	Shelter site
Antelope Valley Regional Emergency Operation Center	County EOC liaison

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Table S-2 lists potential emergency care and shelter facilities which are currently owned by the City.

TABLE S-2

EVACUATION CARE FACILITIES OWNED BY THE CITY

Name of Facility	Facility Address	Capacity
Courson Activity Center	38334 10th Street West Palmdale, CA 93550	60
Courson Senior Center	1002 E. Avenue Q-12 Palmdale, CA 93550	65
Cultural Center	704 E. Palmdale Boulevard Palmdale, CA 93550	150
Desert Sands Park Activity Building	39117 3rd Street East Palmdale, CA 93550	40

The Antelope Valley Chapter of the American Red Cross is responsible for opening and managing mass care facilities. In the event of a major disaster, there may be an

extended delay period of time before the American Red Cross can respond. In the interim, the Director of Emergency Services will:

1. Implement the City's disaster response procedure.

2. Authorize the City's staff to open shelters under the auspices of the American Red Cross.

11. Mutual Aid

The City will continue its mutual aid agreements with other agencies. The City coordinates emergency services in the Planning Area and within the region with various county agencies, the State Office of Emergency Services, and the Federal Emergency Management Agency for responses to disasters that involve the region, state, or nation. City services are also available for mutual aid to neighboring jurisdictions.

12. Emergency Funds

The City will apply for programs and funds from state, federal, and regional agencies to help provide relocation assistance, emergency management, relief goods, post-disaster reconstruction programs, and emergency housing when needed.

13. Neighborhood Watch

The City will continue to work with the Sheriff's Department and local residents in maintaining neighborhood watch programs.

14. Natural Gas Lines

The Planning Department will maintain an up-to-date map of major natural gas transmission lines in the Planning Area. Proposed developments adjacent to gas lines will be regulated to provide adequate separation and buffering from these lines, in the event of a rupture or leak.

15. Joint Land Use Committee Policy Review

The City will implement the land use policies of the Joint Land Use Committee, so as to protect Air Force Plant 42 while maintaining safe conditions in adjacent areas.

16. Household Hazardous Waste Disposal

The City may conduct collection of household hazardous waste from residential areas for proper disposal in nearby facilities on at least an annual basis, and more frequently if deemed necessary.

17. Hazardous Waste Management Plan

The City will prepare a hazardous waste management plan that will assure that hazardous waste facility sites and adjacent land uses are compatible with existing developments and that hazardous materials and wastes are stored, used, transported, treated, and disposed of properly. This plan will be adopted and implemented in accordance with state law.

Through the development review process, risk management and prevention plans will be required for facilities using or producing hazardous materials and wastes, in accordance with state guidelines and the City's adopted Hazardous Waste Management Plan.

18. Development Review

Through the review of site plans, conditional use permits, and other development applications, the City will enforce the standards for floodplain development, hazardous waste facilities and materials, seismic safety, fire prevention and protection, and law enforcement.

19. Water Quality Monitoring

The City will cooperate with the Regional Water Quality Control Board and local water purveyors to implement planning decisions which will protect ground water quality, and consider recommendations from these agencies into the planning and the development review process.

20. Master Drainage Plan

The City will implement the adopted Master Drainage Plan through its capital improvement programs. The City will require developers to comply with the Master Drainage Plan, which provides guidelines for handling nuisance water from developments before storm drain facilities are constructed, in addition to a program for mitigation of regional drainage impacts. The Public Services Element of the General Plan discusses these plans in detail.

21. Zoning Ordinance/Land Use Plan

The City will revise and update its zoning ordinance to incorporate implementation measures in accordance with this Element of the General Plan.

22. Building and Seismic Safety Codes

The City will enforce its building and seismic safety codes which provide minimum standards for the construction of habitable structures. These standards ensure the structural stability and safety of all developments. The Building and Safety Department reviews all construction plans for compliance with codes prior to development. The City's Building and Safety Department responds to citizens concerns regarding unsafe structures and building code violations, and the City's Code Enforcement section requires abatement of all other code violations.

23. CEQA

The City will implement CEQA requirements for new development and for capital improvement projects. CEQA requires evaluation of potential impacts to public safety from seismic, flood, fire, risk of upset (spills, explosions, etc.), and other factors.

24. Airport Land Use Commission

This General Plan is consistent with the Airport Land Use Plan as adopted by the L.A. County Airport Land Use Commission.

25. Truck Routes

The City will develop and adopt an ordinance designating truck routes and prohibiting through truck traffic on residential streets, to the extent permitted by state law.

26. Public Records of Hazards

The City will provide data on known hazards in the Planning Area for public review. This information will increase community awareness and personal preparedness for residents and businesses.

27. Regional Coordination

The City will coordinate with Los Angeles County and the City of Lancaster in addressing public safety issues which affect the Antelope Valley, such as traffic, crime, air pollution, and water resource issues.

28. Minimum Building Maintenance

The City will adopt an Ordinance which specifically sets forth minimum standards for property maintenance. The ordinance will require that all properties within the City are maintained in a condition which is free from potential risks to public health, safety and welfare.

B. Public Safety Standards

The City will enforce public safety standards in reviewing development proposals, and in land use planning. These standards protect future developments from natural and man-made hazards and provide benchmarks for achieving the goals and objectives listed in Section 2. Other standards, such as minimum street widths and peak water loads, are required by the state code. Standards for streets are discussed in the implementation section of the Circulation Element.

1. Standards for Construction and Development

Construction and development standards contained in the Zoning and Building codes include:

- Engineered construction must comply with Uniform Building Code requirements for seismic zone.

- Emergency facilities and sites with explosives and toxic materials must adhere to more restrictive seismic safety construction.

- Emergency facilities shall be set back from known hazard areas (earthquake fault zones, aircraft crash zones, and flood plains).

- Critical use structures must conduct geologic/seismic hazards studies before construction, and implement appropriate construction techniques.

2. Hillside Development Standards

The City has established hillside development standards to prevent landslide and erosion hazards and to preserve natural grades and scenic views, through the recent adoption of the Hillside Management Ordinance addressing the following issues:

- The maximum angle of manufactured slopes.
- The maximum height of a manufactured slopes.
- Fire retardant construction, materials, design and landscaping.
- Maintenance of natural drainage to the extent practical, consistent with the Master Drainage Plan.
- Establishment of maximum street grades.

3. Fire Safety Standards

The City will ensure compliance with fire safety standards. All development shall be subject to the review of the Los Angeles County Fire Department's Fire Prevention Bureau to ensure fire safety standards are incorporated into project design. Standards may include but not be limited to:

- Provision of adequate water for fire fighting purposes (fire flow).
- Use of smoke detectors and fire alarms.
- Provision of fire escapes, fire hoses, or sprinkler systems.
- Use of flame retardant construction.
- Encouragement of use of fire-resistive landscaping around structures and fuel modification areas.
- Building-to-building distances.
- Legible street names and address for easy recognition by emergency personnel.

4. Floodplain Development Standards

The City has adopted a Master Drainage Plan which establishes a consistent policy and program for handling stormwater runoff in developed areas. This plan will be coordinated with the City's capital improvement program. All development in the City must be consistent with the Master Drainage Plan. In addition, all development in flood hazard areas will be required to comply with state and federal regulations, including:

- Executive Order 11988, Flood Plain Management
- Flood Disaster Protection Act of 1973 as amended (PL 93-234)
- National Flood Insurance Program (44 CFR Part 59-75)
- Floodplain Management Guidelines (43 PR 6030)
- L.A. County Flood Control District regulations

Where development in flood hazard areas cannot be avoided, the proposed project or activity must be designed or modified so as to minimize the potential adverse impacts affecting floodplains, restore and preserve the natural and beneficial values served by floodplains, and to use measures which mitigate or reduce the risk of flood loss. Mitigation must achieve protection of life, property, and the natural and beneficial values of the floodplain.

5. Joint Land Use Committee Policies

New projects and land use requests should be reviewed for conformance with the intent of the Joint Land Use Committee (JLUC) policies. The JLUC policies related to safety are as follows:

a. Land Use Within the Accident Potential Zones.

(1) Clear Zone.

All of the Clear Zones are currently within the boundaries of Plant 42 and are not within the jurisdiction of either city (City of Palmdale or City of Lancaster) or the County.

(2) General Policies for the Accident Potential Zone (APZ).

(a) This Safety Element hereby incorporates by reference the FAA Part 77 Regulations and Tab No B-2 of the Master Plan Vicinity Map, Zoning Plan for Air Force Plant 42 for height regulations as they affect the air space around U.S. Air Force Plant 42.

(b) All development shall comply with applicable FAA regulations which affect development in these zones.

(c) The General Plan Land Use Element Hazard Zones Exhibit and the Safety Element Aircraft Crash Zones Exhibit have identified the areas which are included within the Accident Potential Zones.

(d) Open space uses which are low intensity and passive, such as Joshua tree and nature preserves shall be encouraged.

(e) Avigation easements shall be obtained wherever possible in this zone.

(f) Disclosure statements which declare that the property is located within the accident potential zone and is exposed to aircraft noise shall be required on the sale or transfer of property in this zone.

(g) Currently existing areas occupied by incompatible uses shall be examined to determine the potential of the redevelopment process to convert those land uses to airport compatible uses.

(h) New buildings shall be located in a manner which will promote clear linear corridors through the developed area to create potential pilot options in the event of an aircraft emergency.

(3) Accident Potential Zone 1.

(a) New residential uses shall not be approved in this zone.

(b) Commercial uses shall be prohibited.

(c) Industrial uses should be encouraged with the restriction that average employee density shall not exceed 25 persons per acre per hour and lot coverage by buildings shall not exceed thirty percent of the site.

(4) Accident Potential Zone 2.

(a) Residential uses should be discouraged but, if allowed, shall not exceed one dwelling unit/2.5 gross acres.

(b) Commercial uses which do not draw large numbers of customers to the site shall be encouraged. Customer intensive retail operations are excluded. Average employee density should not exceed 25 persons per acre per hour.

(c) Industrial uses should be encouraged with the restriction that average employee density shall not exceed 25 persons per acre per hour and lot coverage by buildings shall not exceed forty percent of the site.

C. Land Use Planning

The goals, objectives, and policies included in the Safety and other elements provide the framework for hazards mitigation through prudent land use planning. One of the most powerful tools for protecting public safety available in the General Plan process is the Land Use Map, which designates the appropriate location for the various types of development permitted in this plan. In areas where a significant hazard is present, the type of development permitted must reduce risks to an acceptable level.

Land uses which would potentially handle hazardous materials/wastes shall not be located near residential areas, critical facilities, immobile populations, and other areas as specified in the City's Hazardous Waste Management Plan.

Flood hazard areas, aircraft crash zones, and the seismic hazard zones are shown on Exhibits LU-4, S-2 and S-17. Unstable soils are shown in Exhibits S-9, S-10 and S-11. *(General Plan Amendment 04-01, adopted by City Council April 14, 2004.)*

New development must be protected from public safety risks and must not add to existing hazards. Development shall be limited in hazard areas as indicated above.

SECTION 4: ISSUES AND OPPORTUNITIES

Threats to public health and safety are posed by natural and man-made conditions. Natural hazards result from characteristics of the environment. They are difficult to control or eliminate and are best avoided in order to reduce their potential for damage. Human action may magnify the potential impact of natural hazards, but the safety risk is primarily dependent on environmental conditions, such as the presence of earthquake faults, flood plains, and steep slopes. Man-made hazards stem from human activity. They happen as a result of specific practices and actions of man which may create a potential for fire, aircraft accidents, hazardous materials contamination, and crime. To eliminate a man-made hazard, the complete suspension of particular activities may be necessary; however, economic forces may require that the activity continue for the community's continued viability.

In the Palmdale area, the major natural hazards are seismic activity, flood, geologic conditions, and wildfire hazards. Aside from these, urban fires, aircraft accidents, hazardous materials contamination, and crime hazards are present due to ongoing human activities.

This section of the Safety Element discusses the natural and man-made hazards that affect the Planning Area and the impacts that they could have on life in the City. It focuses on seismic hazards, flood-related hazards, geologic hazards associated with the slope stability and soils, fire hazards, the risk of aircraft accidents at the USAF Plant 42, hazardous materials, and crime. Some of these issues were identified early in the planning process by City staff, residents, and members of the CAC. In addition, there are statewide and regional safety issues which affect the City. All of these are discussed below.

This section documents existing conditions in the Planning Area and provides the background analysis that led to the recommended goals, policies, and implementation measures contained in the previous sections. Additionally, more detailed information on each issue may be found in the Master Environmental Assessment for the General Plan.

A. Seismic Hazards

A major earthquake in Southern California is expected to cause loss of life, injury, and property damage at a scale unprecedented in this nation's history. While it is impossible to prevent an earthquake from occurring, research is continuing to develop ways of predicting earthquakes. Still, it will be many years before a program which accurately and reliably predicts earthquakes can be implemented.

The City of Palmdale and the Planning Area are located in a seismically active region. The dominant seismic feature affecting the City is the San Andreas Fault which traverses the southernmost portion of the Planning Area. The San Andreas Fault is the boundary where the North American plate and the Pacific plate meet. Relative movement of the plates along this boundary causes earthquakes. This fault is considered one of the most dangerous in the state in terms of destructive potential. The San Andreas Fault extends over 600 miles from the Salton Sea, northwest toward the Pacific Ocean at Point Arena. Two of the three largest (8.0+ Richter) earthquakes in the state have occurred along the San Andreas Fault: the 1906 San Francisco earthquake which caused 21-foot offsets and the 1857 Fort Tejon earthquake. Table S-3 lists earthquake activity on the resulting Modified Mercalli intensity from the San Andreas Fault. Intensity measures the amount of groundshaking caused by an earthquake. An intensity value is assigned by the amount of damage to structures, changes in the earth's surface, and personal accounts.

In addition, several fault traces branch off from the primary fault within the San Andreas Rift Zone. The major fault traces for the San Andreas system in the Palmdale area are the Cemetery Fault, the Nadeau Fault, and the Littlerock Fault. All three faults are active splays of the San Andreas Fault. Thus, movement on the San Andreas Fault may activate one or all of these subsidiary faults. The Nadeau, Cemetery and Littlerock fault traces are located in Palmdale (see Exhibit S-3). Other splays of the San Andreas Fault which are found in Palmdale are the Powerline Fault and the eastern end of the Clearwater Fault.

In addition to the San Andreas Fault system, other principal faults that could produce damaging earthquakes in the Palmdale area are the Sierra Madre-San Fernando, Garlock, Owens Valley, and White Wolf faults. Their maximum probable magnitudes are listed in Table S-4. A maximum probable earthquake is the largest event expected to occur within 100 years. The Sierra Madre Fault is located at the base of the San Gabriel Mountains approximately 20 miles south of the Planning Area. The Garlock and White Wolf faults are northeast-trending faults located 30 to 60 miles, respectively, northwest of the Planning Area. The Owens Valley fault is 60 miles to the northeast and runs north-south. A number of other faults located in the Southern California region could be responsible for earthquakes that would affect the City; although no major damage is expected to occur. Exhibit S-4 indicates the relative location of the major faults near Palmdale and Exhibit S-5 shows earthquake faults in the Southern California region. Section 3.1 of the Master Environmental Assessment for the General Plan includes a detailed description of seismic characteristics in the region.

TABLE S-3

MAJOR SAN ANDREAS FAULT ACTIVITY

Date	Magnitude			Modified Mercalli Intensity	Location
1838	7.0	X	-	Comparable to 1906 earthquake	San Francisco
1857	7.9	IX+	-	Buildings and large trees thrown down	Fort Tejon
1858	6.1	IX+	-	Damage to building frames and foundations	San Francisco
1868	7.0	IX+	-	Many buildings wrecked badly damaged. 30 killed	Hayward Fault
1890	6.8				So. Santa Cruz Mountains
1899	6.7	VIII	-	Brick buildings badly damaged. 6 killed.	San Jacinto Fault
1906	7.7	XI	-	Great earthquake and fire. 700 killed. Greatest damage on poorly filled land. 6.5 meter horizontal slip.	San Francisco
1916	6.0+				Tejon Pass
1922	6.5	IX	-	Damage to masonry buildings and reservoir. Ground cracking.	Cholame Valley
1934	6.0	VIII	-	$41 million damage. 120 killed	Parkfield
1989*	7.1	VIII	-	Localized freeway and bridge collapse. 63 killed.	San Francisco/Bay Area

*Southern Santa Cruz Mountain segment of the San Andreas fault

Source: California Department of Mines and Geology, Fault Map of California and Earthquake Hazards in the Los Angeles Region; Hill et al., 1979; Toppazada et al 1981, 1982; Jennnings 1975

TABLE S-4

FAULT MAGNITUDES

Fault	Maximum Probable Magnitude (Moment)*	Recurrence Interval (Years)
San Andreas	8.0+	50-200
Sierra Madre-San Francisco	6.6	50-200
Garlock	7.5	500-700
Owens Valley	7.4	850-900
White Wolf	7.2	300

*The Moment Magnitude is preferred to the Richter Magnitude for earthquakes larger than 6M. As the magnitude surpasses 6.5M (Richter), all events begin to take on the same magnitude values. The Moment Magnitude keeps its integrity and delineates the different values greater than 6.5M.

Source: California Department of Mines and Geology Preliminary Report #13, C. W. Jennings; Los Angeles County Seismic Safety Element

The amount of groundshaking at a site is often expressed in terms of the peak acceleration relative to acceleration due to gravity. Ground acceleration is the rate of increase of velocity of the ground, where each incremental change in rate can be related to increasing force acting on a structure. Thus, the greater the acceleration, the greater the force acting on a building site. Expected seismic shaking zones for an earthquake with a magnitude of 8.0 or more are also delineated. Zone 1 are areas most likely to experience severe accelerations greater than 0.5 gravity; Zone 2, where acceleration will be from 0.5 to 0.4 gravity; and Zone 3, where acceleration will be 0.28 to 0.4 gravity. Estimated Modified Mercalli intensities from a locally-occurring earthquake will be VII to IX. A VII Mercalli intensity will cause slight to moderate damage to well-built ordinary structures, it will be difficult to stand, and water may become turbid with mud; while a IX Mercalli intensity will cause the partial collapse of most structures, general panic will ensue, serious damage to reservoirs and underground pipes will occur, and there will be visible cracks on the ground.

Aside from groundshaking and ground surface rupture, earthquake hazards include the fissuring or cracking of bedrock, landslides, liquefaction, and ground settlement. Structures most likely to be affected by earthquakes are those that are old or near earthquake faults in areas that may be prone to liquifaction. Dams along earthquake faults may be subject to failure and may cause flooding of the surrounding area. Critical damage may also occur to structures that provide emergency services (hospitals, fire stations, schools, emergency shelters). Roads and utility lines for water, gas, power, telephone, sewer, and storm drainage may be disjointed and services cut off. These structures require special attention in the public safety programs of the City.

In case of a major earthquake on the San Andreas Fault within or near the Planning Area, damage to the following structures is expected:

1. Palmdale and Littlerock reservoirs could sustain surface rupture and cause area flooding. Exhibit S-6 delineates possible inundation areas for both reservoirs.

2. Rail lines crossing the fault may be displaced from Palmdale to Interstate 5.

3. The California Aqueduct may rupture causing flooding of the surrounding area and loss of water supply to the region (Exhibit S-7).

4. Telephone lines, sewer pipes, and water lines may be truncated.

5. High voltage lines (138 kv and greater) may be damaged, along with the Vincent substation, causing power failure in the area. Exhibit S-8 shows the relative location of these lines.

6. Two high pressure gas lines running along Avenue S may be ruptured as shown in Exhibit S-8.

7. Highways that may be temporarily closed include:

   - Antelope Valley Freeway from Lancaster to Sierra Highway
   - Sierra Highway between Pearblossom and Avenue S
   - Pearblossom Highway from Sierra Highway to Route 138
   - Route 138 from Littlerock to San Bernardino County Line
   - Elizabeth Lake Road
   - Bouquet Canyon Road
   - Avenue S between 25th Street East and the Antelope Valley Freeway *(General Plan Amendment 04-01, adopted by City Council April 14, 2004.)*
   - Tierra Subida Road between Avenue R and the California Aqueduct *(General Plan Amendment 04-01, adopted by City Council April 14, 2004.)*

8. Other critical structures used for emergency services (schools, congregate care facilities, shelters) may be subject to major damage during an earthquake.

9. Damage may be sustained by residential and other structures located close to the fault rupture due to intense groundshaking and slope failure.

10. Metrolink commuter train service and freight service may be interrupted. *(General Plan Amendment 04-01, adopted by City Council April 14, 2004.)*

The Alquist-Priolo Earthquake Fault Zoning Act, formerly known as the Alquist-Priolo Special Studies Zones Act, was signed into law on December 22, 1972 and went into effect on March 7, 1973. Under this act, the State Geologist is required to delineate "special studies zones" along known active faults (active faults include those where an earthquake has occurred in Holocene time - from the present time back to 11,000 years). The purpose of this Act is to prohibit the construction of new buildings across the trace of active faults. Cities and counties affected by the provisions of this act must regulate development within the seismic hazard zones through zoning controls, geologic studies, or other measures (Hart 1988). The Alquist-Priolo Act and the seismic hazard mapping program delineated by the State Geologist address surface rupture hazards, liquefaction and earthquake-induced landslides and strong groundshaking caused by earthquakes. *(General Plan Amendment 04-01, adopted by City Council April 14, 2004.)*

Safety

The San Andreas Fault zone is among those active faults identified in the legislation where special land use planning considerations are required to minimize the loss of life, injury, and property damage due to surface rupture in the event of a major earthquake. The zone includes areas located within one-eighth mile of an active fault. Policies and criteria for dealing with seismic hazards were established to assist cities and counties, although the act does not preclude local governments from adopting more stringent requirements. The City of Palmdale implements the Alquist-Priolo Earthquake Fault Zoning Act by means of the development review process, in which every proposed development within the seismic hazard zone is required to prepare a detailed geotechnical report and fault rupture survey. These studies are then reviewed by the City Geologist and special conditions (i.e., structural setbacks and/or special engineered foundations) are placed on projects as deemed necessary by the City Geologist. *(General Plan Amendment 04-01, adopted by City Council April 14, 2004.)*

Earthquakes affect areas several miles away from the epicenter and continue to elude prediction. The only presently known measures to minimize the hazards involve structural reinforcement, physical separation, and emergency preparedness to deal with the aftermath of the disaster. The City of Palmdale will utilize every available measure to protect public safety and minimize property damage from seismic hazard through the policies and implementations programs contained in this Element.

B. Geologic Hazards

The area's geology determines its capacity for supporting man-made structures. In Palmdale, consolidated rocks make up the mountains and rocky buttes while alluvial soils are found on stream beds and the valley floor. Pelona schist underlies most of the mountainous portions of the Planning Area. Beneath the alluvial soils are the same hard rocks as found in the mountain areas. Geologic hazards are present in the form of unstable soils and certain ground formations which render some areas unsuitable for intensive human activity.

Hillside Areas

The Planning Area features steep slopes on its southern and western edges. These areas include unstable slopes, and areas subject to erosion. Areas with slopes less than 10 percent are generally considered suitable for all types of development. Those with a 10 to 25 percent slope are typically required to use hillside construction techniques to achieve substantial foundation support and stable soil conditions. Areas with slopes greater than 25 percent are subject to instability and erosion and are generally not recommended for development. Exhibit S-9 shows the slope categories within the Planning Area. Increasing urbanization on the hillsides could expose the

community to possible landslides and rockslides which may result in human injury and property damage.

Extensive grading will be required to create a developable surface on hillside areas. However, grading is also a form of land disturbance which may promote land failure. To ensure public safety on hillside developments, the Hillside Management Ordinance was adopted to address the issues listed in Section 3 of this Element.

Soils Within Fault Rupture Areas

Lands adjacent to fault zones are exposed to geologic hazards as a result of repeated fault movement. Earthquakes give rise to broken subsurface rocks, ground surface fracture, and clay gouge. Broken subsurface rocks may not be readily apparent but the ground would no longer have its original cohesive and shear strength to carry building loads. Surface cracks and dips increase the potential for erosion and landslides. Clay gouge occurs as a result of faulting and may cause differential ground settlement. Repeated ground movement from earthquake and grading will cause more settlement in areas with granular soils than in other places. Liquefaction potential is determined based upon soil type and distance to groundwater.

Expansive Soils

A soil's potential to expand when wet and shrink when dry depends on the type and amount of clay in the soil. Soils with certain types of clay tend to swell or expand when its water content is increased. They also shrink disproportionately when dry. Highly expansive soils can cause structural damage to foundations and roads. Landscape irrigation could concentrate subsurface water and subsequent soil expansion could cause land slippage and structural damage. Soils with low shrink/swell potentials are suitable for building, with other factors considered. A high shrink/swell potential makes the site less suitable. Detailed investigations may be necessary for areas with moderate to high expansion potentials. Development on expansive soils requires special grading and construction techniques which increases development costs. Exhibit S-10 shows the expansion potential of soils in the Planning Area.

Soil Erosion/Sedimentation

The propensity for soil erosion by wind or water runoff is dependent on soil type and its consolidation, vegetative cover, slope, and runoff velocity. Erosive soils are noted in Exhibit S-11 and are often found in steep slopes where runoff velocity is also greatest and vegetative cover least. Eroded materials end up on the valley floor with coarse materials near the hillsides and finer ones in areas farther from the slopes. Erosion can

usually be controlled with slope planting, the control of drainage flows, terracing, and retaining walls.

Soil Infiltration Capacity

The water percolation quality of soil or its permeability depends on grain size, the amount of compaction, and soil depth, among other things. Coarse-grained soils such as sand and gravel are more permeable than silt or clay. The ability of soil to percolate water determines which areas are best for groundwater recharge, where septic tanks are appropriate, and what proportion of storm water will be absorbed by the ground. Exhibit S-12 characterizes the infiltration capacity of soils in the Planning Area. Soils with very slow infiltration when thoroughly wetted have high runoff potential. They are usually highly expansive clay soils, soils with high water tables, and soils with clay layers or impervious material near the surface. Soils with slow infiltration when thoroughly wetted are fine-textured and have a layer that impedes the downward flow of water. High runoff and slow water transmission is associated with these soils. Moderate infiltration means a moderate runoff potential, with medium-textured and well drained soils. High infiltration characterizes deep, excessively drained soils with low runoff potentials. They consist mainly of sand and gravel materials. Sites with very poor percolation may be difficult and expensive to develop due to sewer and storm drainage requirements. Normally, each development is required to detain project related storm run-off on site. In areas of soils with very poor infiltration capacity, storm water must be conveyed via storm drain to an acceptable off-site detention site; sometimes a considerable distance away.

Septic Tank Limitations

Exhibit S-13 shows areas with septic tank limitations. Soils with a permeability of more than 1 inch per hour, excessive or good drainage, no flood hazard, and a permanent water table more than 6 feet deep are considered to have slight limitations for the use of septic tanks. Moderate limitation is characterized by soils of a permeability of 1.0 to 0.63 inch per hour or less, somewhat poor drainage, flooding length is less than 48 hours and the permanent water table is from 4 to 6 feet. Severe limitations for septic tanks are due to a permeability of 0.63 inch per hour or less, very poor drainage, a chance of flooding 1 year in 5, and a water table less than 4 feet. Sewer systems are needed in these areas to reduce the hazards to residents and the environment. Drywell disposal of nuisance water may be ineffective in these areas and alternative disposal methods need to be provided. The City's current policy is to require connection to a public sewer for all new single family development on lots of less than one acre, all multi-family development and all commercial or industrial projects. Where septic systems are permitted, they are governed by regulation of the State Water Quality Control Board, Lahanton Region.

Subsidence

Ground subsidence is caused by decreasing subsurface pressure and can be traced to the pumping of groundwater, natural gas, or oil. The substantial loss of ground fluid creates a vacuum that gradually causes the sinking of the ground. Subsidence may adversely impact development, as well as cause damage to underground utility lines. Rates of subsidence are plotted in Exhibit S-14. Although the southwestern portions of the City are not classified, this does not mean that no subsidence has occurred, only that no survey has precisely measured subsidence in the area.

Hydrocompaction

Collapsible (hydrocompactive) soils are low density, fine-grained, granular soils containing minute pores and voids. They possess some cementation in dry condition but when saturated, these soils undergo a rearrangement of the grains and a loss of cementation. This rearrangement results in the collapse of the soil structure at depth and differential settlement at the surface, even with relatively low loads. Collapsible soils are extremely sensitive to increased moisture due to a rise in the water table or over irrigation.

Collapsible soils result from deposition where materials have not had enough contact with moisture to form a compact soil. These soils are abundant in arid environments on recently deposited Holocene alluvium and older unconsolidated sediments. Two principal depositional regimes that result in collapsible soils are eolian sands and silt and mudflow sediments. The arid environment with Quaternary deposits that are susceptible to collapsible soils are found in the Planning Area.

Only isolated investigations have occurred in the Antelope Valley that do not make it feasible to map out areas where collapsible soils may present hazards to development. Water channels and alluvium fans are especially susceptible to collapsible soils. All desert soil may be considered collapsible in the first few feet because the alluvium is so dry that it causes settlement when wetted. Soils investigations should be performed prior to any construction activity to determine the presence of collapsible soils. Areas with collapsible soils should not be developed unless the hazard is remedied through acceptable engineering practices for achieving soil stability.

Complete elimination of geologic hazards is not possible due to the expense and the potential damage to the environment from massive alteration of the terrain. Danger can be avoided by regulating or restricting construction in areas with soil stability problems. It can also be reduced to some extent by grading and other engineering methods which remedy soil instability and provide a stable foundation for building construction.

Differences in soil stability can be handled by engineering methods to offset any potential damage to the foundation which would reduce structural strength of buildings.

C. Flood Hazards

Rainfall in the Antelope Valley is relatively sparse due to its location on the leeward side of the Sierra Pelona and San Gabriel Mountains. Only a small section on the southwest of the Planning Area features south-facing slopes of the Sierra Pelona Mountains. The average annual rainfall is 5.15 inches in Palmdale and approximately 20 inches in the mountains. However, throughout most of the year, very little surface runoff from the upper watersheds ever reaches the City.

Sheetwash occurs along major drainages and adjoining areas on scattered sites. Areas with flood hazards are the natural drainage channels of Amargosa Creek, Anaverde Creek, Little Rock Wash, and Big Rock Wash (see Exhibit S-15). Flat plains and natural depressions are also subject to possible flooding.

Urban development reduces the total ground absorption area by creating impermeable surfaces (structures, pavement, streets). Storm runoff, increased by the presence of impermeable surfaces, flows from developed areas, contributing to street flooding. Moreover, developed areas generate irrigation water runoff from landscaping which may channel nuisance water flow into nearby undeveloped areas and street gutters.

The amount and frequency of rain is variable, and although flood waters may be diverted, the lack of a completed regional drainage system will continue to result in local flooding problems. The City has an adopted Drainage Master Plan. It will take approximately 20 years to complete construction of the entire system. The plan addresses storm water runoff from higher slopes and existing and future developments. The Los Angeles County Department of Public Works has completed and adopted the Antelope Valley Comprehensive Plan of Flood Control and Water Conservation (June 1987), which is currently being implemented in the unincorporated portions of the Antelope Valley. The storm drainage section of the Public Services Element discusses flood hazards in more detail. *(General Plan Amendment 04-01, adopted by City Council April 14, 2004.)*

Earthquake faults create vertical barriers to groundwater which may result in shallow groundwater conditions. They may also limit the amount of water which can percolate into the subsurface, thus increasing the amount, velocity, and erosive capacity of stormwater runoff on hillsides.

Surface rupture and groundshaking from earthquakes may result in rupture of the Palmdale and Littlerock Dams, causing flooding as shown in Exhibit S-6. Flood waters could be as deep as 50 feet immediately downstream of the Littlerock Dam. Failure of

the Littlerock Dam would result in the inundation of a 300-foot wide area for 0.25 mile north of the dam. Along this length, the water depth would vary from 50 to 15 feet. Ten minutes after failure, the flood water would veer eastward for 800 feet to Avenue U where the depth would be reduced to 10 feet. Trending north from Avenue U, the water would eventually dissipate so that the depth is no longer a risk to downstream developments.

In addition to dam failure and subsequent flooding, a seismic event could cause a water wave, or seiche to occur at Lake Palmdale, which could potentially overtop the dam. The design report for the dam considers a reflection of the wave on return unlikely. Also, wave volume above the dam would not be substantial (approximately 1 acre-foot), and would not result in damaging floods. Overpour on the downstream side of the dam will not cause any damage by erosion as the existing rockfill was designed to withstand it. The Sheriff's Department has been assigned with the coordination of notification efforts and local evacuation in the event of dam failure.

In the event of a large magnitude local earthquake on the San Andreas Fault, some portions of the California Aqueduct are likely to fail. The east branch of the aqueduct is highly vulnerable to widespread damage from groundshaking hazards because it closely parallels the San Andreas Fault for over 100 kilometers. Moreover, the east branch crosses the fault at several locations near Palmdale (Leona Siphon and Barrel Springs) which are susceptible to surface rupture hazards. The Department of Water Resources (DWR) has installed flood control gates to mitigate any structural failure. By closing the gates upstream, the section of the Aqueduct in the Planning Area will be isolated and will not receive water. Aqueduct water present during failure will be diverted to pools which serve as detention basins. The eight pools within the Planning Area have varying storage capacities and locations as indicated by Table S-5.

Exhibit S-7 depicts the direction of flow from the pools and the locations where the Aqueduct crosses the fault at Leona Siphon and Barrel Springs. The extent and rate of inundation is speculative since the amount of water in the Aqueduct varies between seasons and years. Various factors which affect the size and extent of flooding include structural failure of the Aqueduct and pools while the Aqueduct is operating at full capacity, adjacent pools outside the Planning Area draining, and emergency power failure which could result in the Aqueduct gates not closing fast enough.

D. Fire Hazards

Wild Fires

Wildfires occur on mountains, hillsides, and grasslands. The speed and extent of their spread depends on the area's vegetation, climate, and slope. In the Planning Area,

native vegetation types such as chaparral and grassland provide the fuel that allows fire to spread easily across large tracts of land. These plant species are capable of regeneration after a fire, making periodic wildfires a natural part of the ecology of these areas. The hot, dry climate of the Antelope Valley keeps the grass dry and readily combustible. The Santa Ana winds can spread fires into adjacent areas. Steep slopes bring grass and brush within reach of upward flames while impeding the access of firefighting equipment. Within Palmdale, wildfire hazards areas exist within the southern and western portions of the Planning Area. Exhibit S-16 shows wildfire hazard areas.

TABLE S-5

AQUEDUCT POOLS

Pool Number	Storage Acre-Feet	Capacity Million Gallons	Location
49	283	92.2	70th Street West at Avenue N to the Ritter Siphon
50	474	154.4	Quartz Hill where 50th Street West crosses the aqueduct
51*	23	7.5	On the San Andreas Fault between Ritter Siphon and Leona Siphon
52**	138	45.0	Platt Ranch west of Lake Palmdale
53	449	146.3	At Soledad Siphon, upstream of the Palmdale Reservoir
54*	189	61.5	30th Street East at Barrel Springs Road
55*	258	84.1	Where Cheseboro Road crosses the aqueduct at the Cheseboro Siphon
56*	170	55.4	Littlerock Siphon
Total	1,984	646.4	

*Where the California Aqueduct crosses the San Andreas Fault: the aqueduct just south of Leona Siphon and near Barrel Springs will be severely damaged by fault rupture.
**Nadeau Fault Crossing
Source: Department of Water Resources

The fire season in the Palmdale Planning Area occurs roughly from September to November when the Santa Ana winds blow. If rains are minimal, grass may dry as early as May and brush as early as July. From December to April, in the rainy season, wildfires rarely occur.

Wildfires may be started by various methods including: carelessly used matches, cigarettes discarded in the brush, the lack of spark arrestors in offroad vehicles, target

shooting ricochets and arson. In turn, firefighters are hampered by motorists who do not yield to fire vehicles or who do not know how to provide clear passage in emergencies, as well as the steep terrain in areas where wildfires typically occur.

The fire protection services section of the Public Services Element discusses fire services in the Planning Area. Also, the valley has three fire suppression camps where jail inmates work as labor crews during major brush fires.

Urban Fires

Urban fires pose a public safety threat within developed environments, destroying buildings and other man-made structures. These disasters are often due to faulty wiring or mechanical equipment, combustible construction materials, and the absence of fire alarms and sprinkler systems. Human accidents with appliances and equipment, and the careless use of cigarettes and matches also cause urban fires. Older buildings are considered more likely to have fires since they often do not comply with present standards for fire safety construction. To minimize fire damage and loss, the Fire Department sets standards for building design and construction requiring the provision of adequate water supply for firefighting, fire retardant construction, and minimum street clearances, among other things. Fire prevention awareness programs are conducted to train residents to respond quickly and correctly in order to reduce injury and losses during fires.

In the Planning Area, fires have been largely caused due to human accidents. Fire hazards are continuously present in the form of older buildings in the City center, although high density development pockets do not exist to compound the danger.

Industrial areas, gas transmission and distribution lines, and higher voltage power lines represent potential sources of fire. The USAF Plant 42 is particularly susceptible to fire due to the nature of the industry. It has its own fire department to deal with fire hazards at the plant. Exhibit S-16 shows the location of fire hazards in Palmdale. *(General Plan Amendment 04-01, adopted by City Council April 14, 2004.)*

In order to minimize hazards associated with both wildfire and urban fires, the City and/or the Los Angeles County Fire Department will require fire protection plans, greenbelts, special access roads, fuel modification zones and non-combustible construction techniques as necessary on a case-by-case basis. The fire protection services section of the Public Services Element describes current fire services in Palmdale.

E. Aircraft Accident Potential

Seventy-five percent of reported aircraft accidents have occurred on or near airport runways. These accidents may cause injury, death, fire, explosion, damage to property, straining hospital facilities, disrupting traffic and utilities, and causing crowd control problems.

The presence of USAF Plant 42 in the Planning Area carries with it the potential for aircraft accidents within Air Force property and in surrounding areas. This potential will be compounded by the operation of the proposed Palmdale Regional Airport, east of the USAF Plant. The number of flights at the USAF Plant 42 fluctuate widely with an average of 250 to 300 landings per day. Almost 30 percent of these are test flights and 70 percent are training flights. Thirteen accidents have occurred at the plant since 1954, when flight records began. Five of the accidents involved civilian aircraft, four of which were mid-air collisions. The other was a result of mechanical failure. The remaining eight accidents occurred during takeoff and landing of military aircraft. Five occurred onsite, three others within a 2-mile radius of the plant.

The USAF minimizes disaster potential by following strict safety precautions and by having its own emergency personnel for crash and rescue operations. Development proposals around the plant are subject to review by the USAF to ensure compatibility with plant operations. In 1991, the City of Palmdale, City of Lancaster and the U.S. Air Force formed Joint Land Use Committee (JLUC) to discuss airport land use compatibility issues. The JLUC produced a number of policies affecting land use decisions for projects in the general vicinity of Plant 42. These policies are included within the Noise Element of the General Plan. In 2002, the Air Force updated its Air Installation Compatible Use Zone (AICUZ) Study. In addition to identifying aircraft clear zones and accident potential zones, the study identifies noise contours ranging from DNL 60 dB to DNL 80 dB (Day-Night Average A-Weighted Sound Level) based on the average busy day aircraft operations data collected in 2001. The noise levels depicted in the 2002 AICUZ study differ somewhat in both shape and extent from the noise contours in the 1990 AICUZ study, with current levels less than 1990 levels. The reduction in noise levels is due to a different mix of aircraft at the airfield and the testing of more modern aircraft with quieter engines. *(General Plan Amendment 04-01, adopted by City Council April 14, 2004.)*

The increasing pressure for development in the Palmdale area will find more people living around the USAF plant in the future than at present. The JLUC policies were designed to ensure that the community would be protected from risk of aircraft accident. *(General Plan Amendment 04-01, adopted by City Council April 14, 2004.)*

Exhibit S-17 delineates aircraft crash zones for the USAF Plant 42 and the proposed regional airport. The potential for accidents is highest at the end of the runway (30

percent) and decreases with distance from the end of the runway. The Clear Zone is a 3,000-foot by 3,000-foot area at the end of the runway, within which any development would pose a major risk of life and property. The USAF Plant 42 owns this land and prohibits any form of development. Accident Potential Zone (APZ) I is 3,000 feet wide and 5,000 feet long and contains a significant risk (8 percent) and APZ II is 3,000 feet wide and 7,000 feet long with measurable potential (5 percent) for accidents.

F. Hazardous Materials/Wastes

Trace metals and chemical compounds used in industry have caused toxic pollution of the environment and harmful effects on man. The concern for the production, storage, transport, and disposal of hazardous materials and wastes arises in the wake of widely publicized health and safety problems due to improper handling.

In response to public concerns, the State has adopted legislation requiring local government agencies to prepare plans to address the handling and disposal of hazardous materials and wastes within local jurisdictions. The City has adopted a hazardous waste management plan and will continue to comply with and support efforts to enforce these regulations. *(General Plan Amendment 04-01, adopted by City Council April 14, 2004.)*

AB 2185 and 2187 (Waters, 1985 and 1986) were intended to protect public health, safety, and the environment by establishing business and area plans relating to the handling, and release or threatened release of hazardous materials/wastes. The area plan for Los Angeles County has been developed and is implemented by the Los Angeles County Fire Department. The area plan covers all of Los Angeles County and includes an inventory of hazardous materials/wastes facilities in the County, procedures for emergency notification response, pre-emergency planning measures, and public safety information. Facilities with more than a specified amount of hazardous materials/wastes onsite, must submit a business plan to the Los Angeles County Fire Department. The information in the above plans is available for public review.

No hazardous waste landfills are currently located in the Planning Area. The Antelope Valley Landfill (Palmdale Disposal) is a non-hazardous Class II landfill. Groundwater and surface waters are protected from contamination by wastes deposited at the landfill through required waste management practices in place at the landfill.

The U.S. EPA Superfund program is responsible for identifying potential hazardous waste sites and appropriate cleanup funds. The USAF Plant 42 is listed on the EPA's Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) database as a potential contamination site. The California Department of Heath Services (DHS) has also identified USAF Plant 42 as a hazardous waste site targeted for clean up. Twenty eight contaminated areas have been identified.

Safety

Information available to date indicates that no hazardous waste exposure to public health or the environment exists at this time. The DHS will oversee subsequent investigation and clean-up actions and the Department of Defense will provide necessary funding. Completion of remedial actions is targeted by the State for 2006. *(General Plan Amendment 04-01, adopted by City Council April 14, 2004.)*

Several State agencies monitor hazardous materials/waste facilities. Potential and known contamination sites are monitored and documented by the DHS and the Regional Water Quality Control Board (RWQCB). A review of the leaking underground storage tank list produced by the RWQCB, and the Hazardous Waste and Substances Sites List produced by the Office of Planning and Research, indicates that four hazardous waste sites are located in Palmdale or in the surrounding communities (see Table S-6).

If an imminent public health threat is posed by USAF Plant 42 or the sites listed in Table S-6, the City will support local regulating agencies in notifying the public.

TABLE S-6

HAZARDOUS SITES

Address	Problem	Source
6851 East Avenue T Littlerock	Tank Leak	WQCB
Black Gold Service Station 8157 Highway 138 Littlerock	Tank Leak	WQCB
Palmdale Regional Airport 39441 North 25th Street Palmdale	Tank Leak	WQCB
Lockheed 2500 East Avenue M Palmdale	Tank Leak	WQCB

WQCB = Water Quality Control Board

Hazardous Sites

Transport of hazardous materials/wastes and explosives through the Planning Area is regulated by the California Department of Transportation (DOT). The Antelope Valley Freeway and Highway 138 are State routes and are open to vehicles carrying

hazardous materials/wastes. City streets and unincorporated County areas are generally not designated as hazardous materials/wastes transportation routes, but a permit may be granted on a case-by-case basis. Transporters of hazardous wastes are required to be certified by the DOT and manifests are required to track the hazardous waste during transport. Although no spills have been reported, the danger of hazardous materials/waste spills during transport exists and will potentially increase as industrial development in the Planning Area increases. At present, the Los Angeles County Fire Department is responsible for hazardous materials accidents at all locations within the City, except at USAF Plant 42, where the Air Force Fire Department is the responsible agency.

Development of industrial land in the Planning Area could increase risks associated with hazardous materials/wastes use. Programs for proper storage, handling, and disposal need to be developed according to State, Federal, and local guidelines to reduce those risks. The City will support, assist in, and undertake such programs to the extent provided by law.

G. Crime

Crime and other acts of violence undermine the community's sense of security and threaten public safety. As Palmdale develops, the increasing concentration of population will bring increasing criminal activities, even if the crime rate (number of crimes per 1,000 population) remains constant. While it is expected that individuals will take normal precautions to protect themselves from danger, the City provides additional protection from harm brought on by the malicious intent of others by contracting with the Los Angeles County Sheriff's Department for law enforcement and crime deterrence within the City boundaries. Additionally, as part of the development review process, all new projects will be reviewed for ease of patrol, accessibility and visibility in order to assist law enforcement efforts. For certain projects, the City may require provision of on-site security services. The police protection services section of the Public Services Element contains additional discussion of crime and police protection in the Planning Area.

H. Constraints

The constraints to protection of public safety are directly related to the causes of natural and man-made hazards. Natural hazards include wildfires and geologic hazards which have known causes, but precautionary measures are not always observed. Other natural hazards, flooding and earthquakes, are less predictable and can only be avoided to the extent they can be predicted. Man-made hazards resulting from human activity include aircraft crash potential, crime, hazardous material/wastes use, and urban fires.

The following constraints limit the ability of the City to plan for and protect its residents from the effects of these hazards:

1. Unpredictability of the Event: The unpredictability of natural disasters is often rooted in the limited understanding of nature and its ways. Earthquakes continue to elude prediction because of an incomplete knowledge of natural forces and their interrelationship. If an effective safety strategy is to be developed, the causes of disasters and value of losses should be known. This is difficult to ascertain for natural hazards. Considerable research is still needed to determine why, when, and where disasters will occur. This knowledge is critical in planning effective public safety programs but is unavailable.

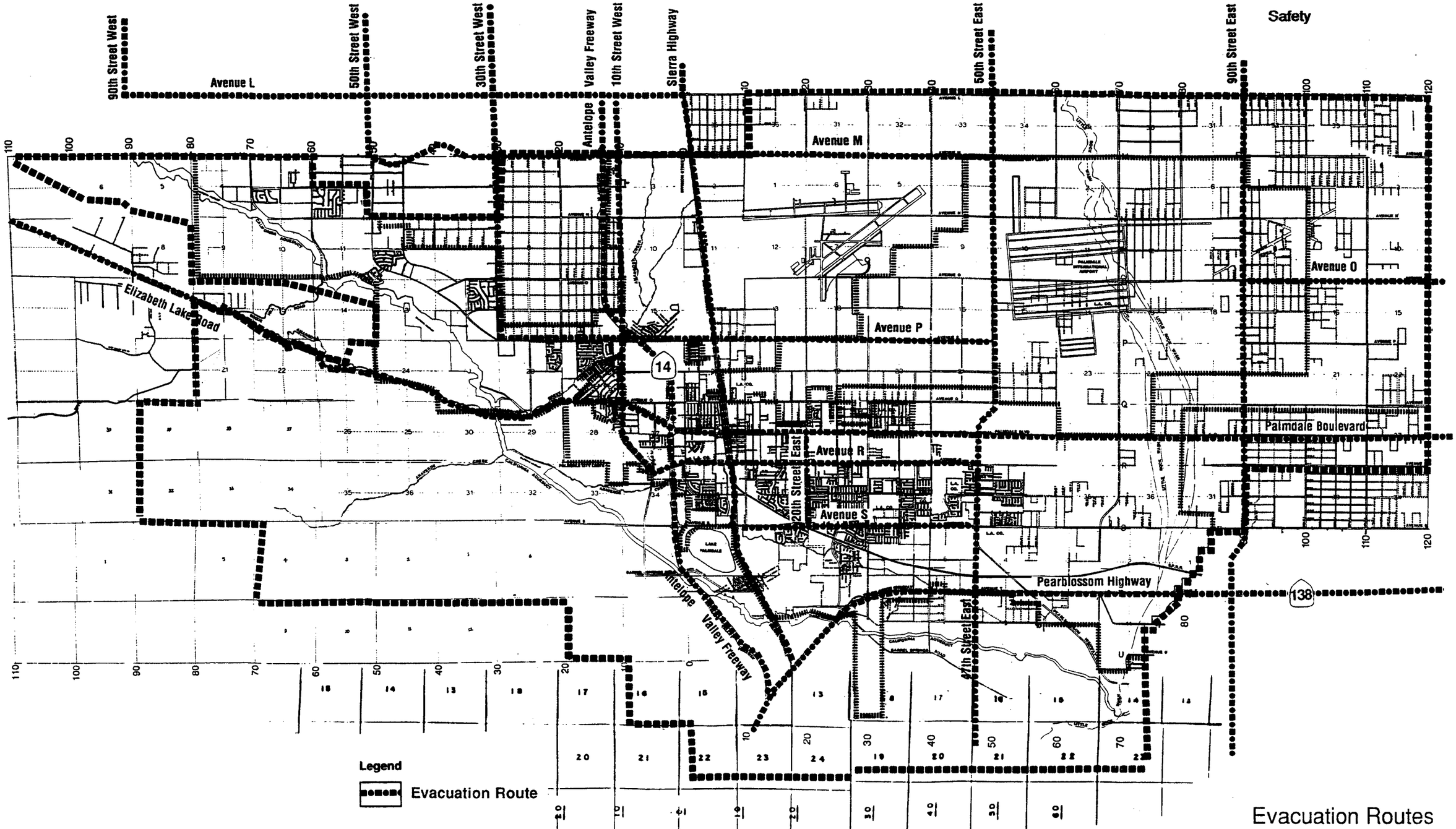
2. Land Development Patterns Which Impede Timely Response: As Palmdale develops, land prices increase and land use patterns are established, making it difficult to correct for safety hazards. High density development areas necessitate additional safety precautions for fire protection and emergency access. Evacuation coordination and control is more difficult, and losses of life and property are likely to be greater in densely developed areas. It is important to reserve access routes and sites for emergency facilities as development occurs.

3. Limited Resources Available for Protection: Public safety may be described as the preservation of human life and the protection of property. While the quantification of property damage is made in dollar amounts, the value of life and social disruption is harder to evaluate. The priority ranking of safety programs is even more difficult because of limited funds and the subjective value of safety. Still, monetary calculations seem to be the best available method of judging public safety. Government intervention is often based on total potential damage in dollars of a disaster versus the potential cost of providing preventive safety measures up front. As part of its safety planning, the City must decide how much risk it is willing to accept, and design safety measures, emergency services, and land use patterns accordingly.

4. Human Carelessness: The imperfection of humans will continue to create and cause hazards in the Planning Area. Carelessness in construction or in the evaluation of hazards will mean less than adequate structures to withstand disaster. Carelessness can lead to fires and accidents (plane crashes, hazardous material spills, and misuse), or may unnecessarily expose individuals to harm.

5. Lack Of Individual Precaution: If citizens do not take the necessary precaution and preparation to protect themselves from disaster and harm, no amount of City effort or regulation will reduce the potential for harm. Public awareness and preparation programs will show the people the best ways to avoid disaster, to protect themselves, and to prepare for a disaster.

6. Economic Necessity for Certain Activities: The elimination of hazards caused by human activities is directly dependent on the suspension of that activity or set of activities. This is often impossible because of higher goals and needs that override the danger posed by such activities. Aircraft flight at the USAF Plant 42 or the use of hazardous materials in industry, are two examples of hazards that are potentially avoidable but are considered necessary for the economic viability of the community.



Evacuation Routes

Palmdale General Plan

North

0 4000 8000 Feet

Adopted by City Council 1/25/93

EXHIBIT S-1

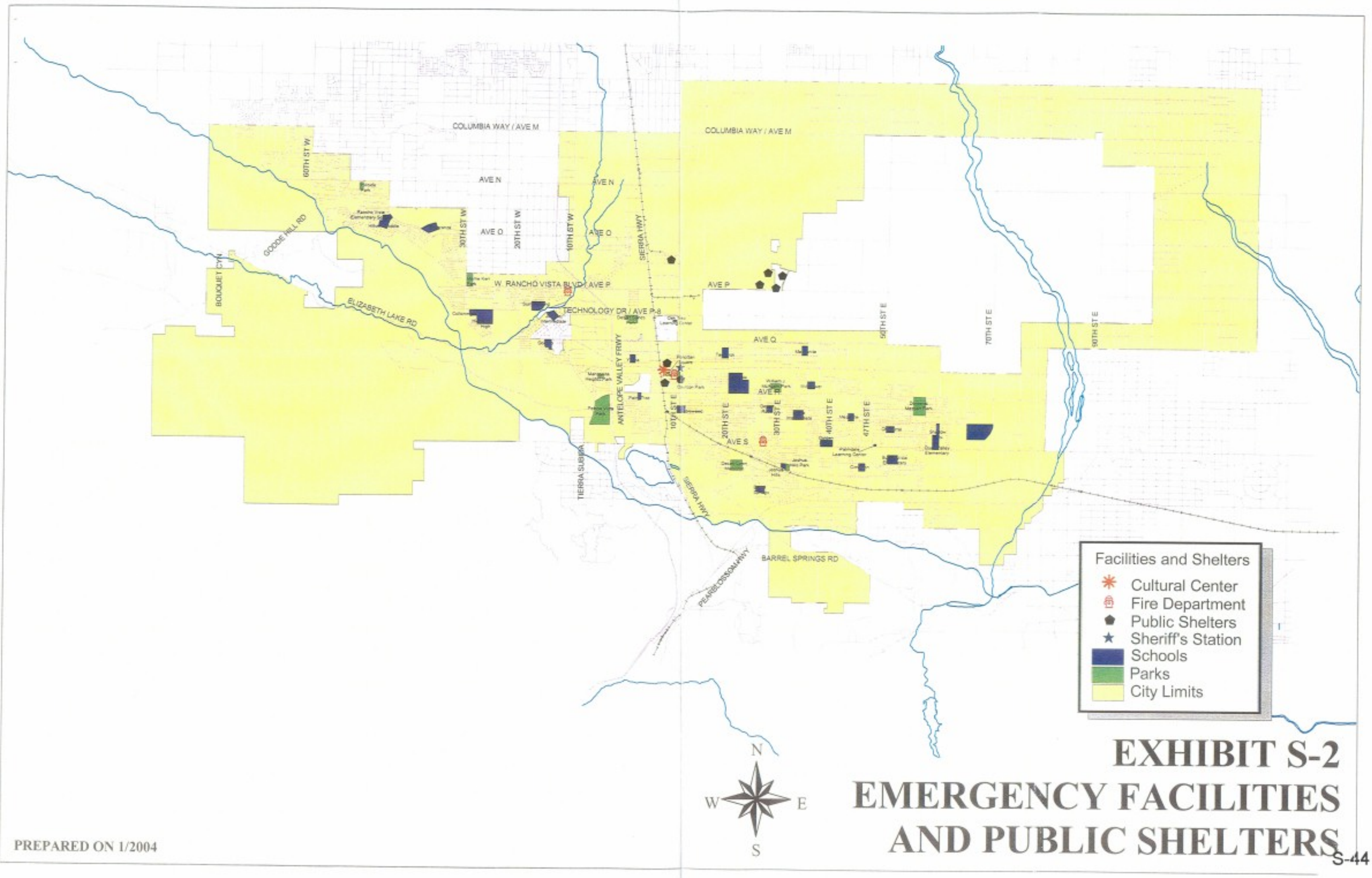
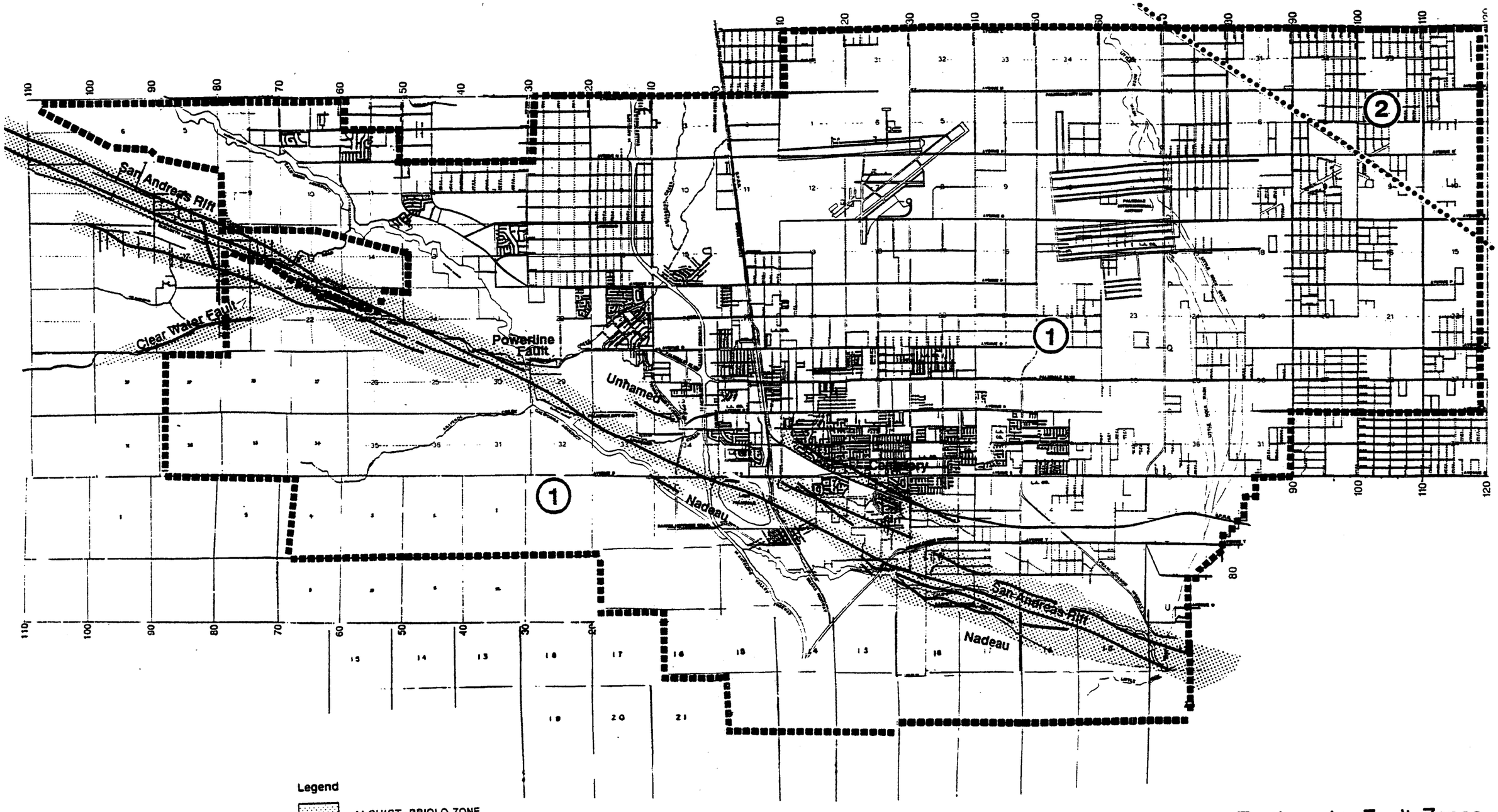


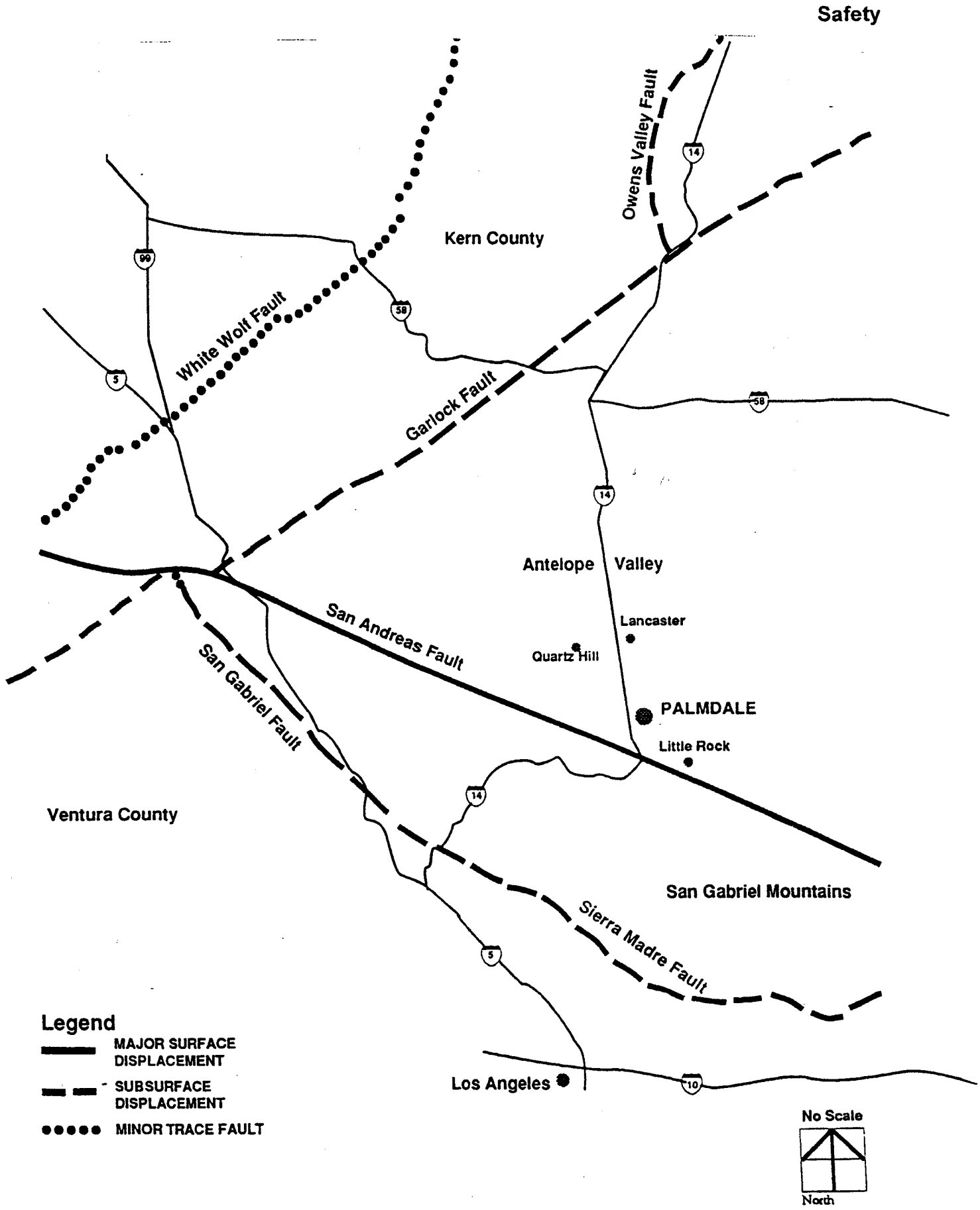
EXHIBIT S-2
EMERGENCY FACILITIES AND PUBLIC SHELTERS

PREPARED ON 1/2004



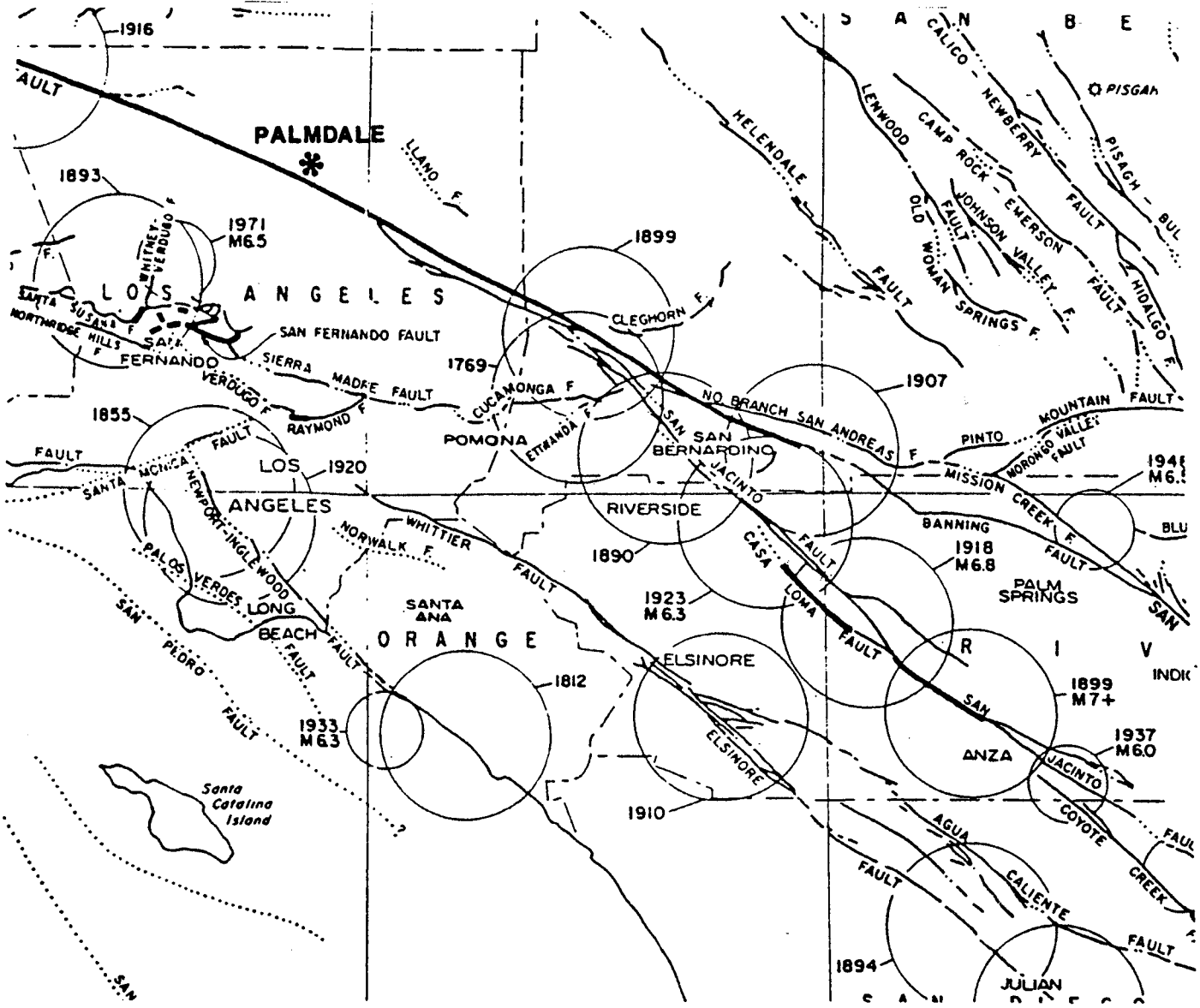
Earthquake Fault Zones
Palmdale General Plan

Adopted by City Council EXHIBIT S-3
1/25/93



Major Faults Near Palmdale

EXHIBIT S-4 S-46



EXPLANATION*

ACTIVE FAULTS

Total length of fault zone that breaks Holocene deposits or that has had seismic activity

Fault segment with surface rupture during an historic earthquake, or with aseismic fault creep

Holocene volcanic activity (Amboy, Pisgah, Cerro Prieto and Salton Buttes)

EARTHQUAKE LOCATIONS

1899 M7+

Approximate epicentral area of earthquakes that occurred 1769-1933. Magnitudes not recorded by instruments prior to 1906 were estimated from damage reports assigned an intensity VII (Modified Mercalli scale) or greater, this is roughly equivalent to Richter M 6.0. 31 moderate** earthquakes, 7 major and one great earthquake (1857) were reported in the 164-year period 1769-1933.

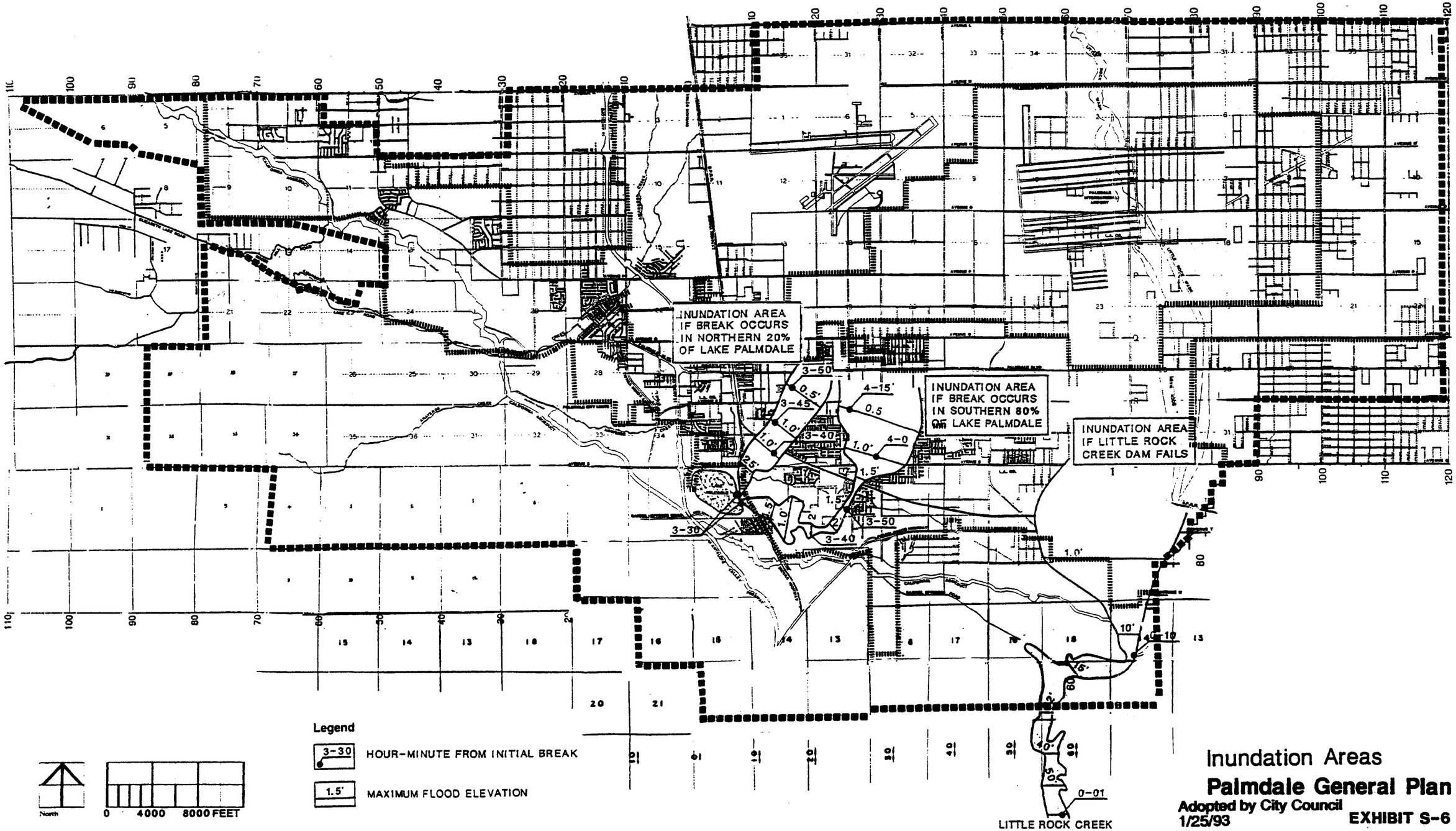
1937 M7.7

Earthquake epicenters since 1933, plotted from improved instruments. 29 moderate** and three major earthquakes were recorded in the 40-year period 1933-1973.

North

Major Faults in Southern California
Palmdale General Plan

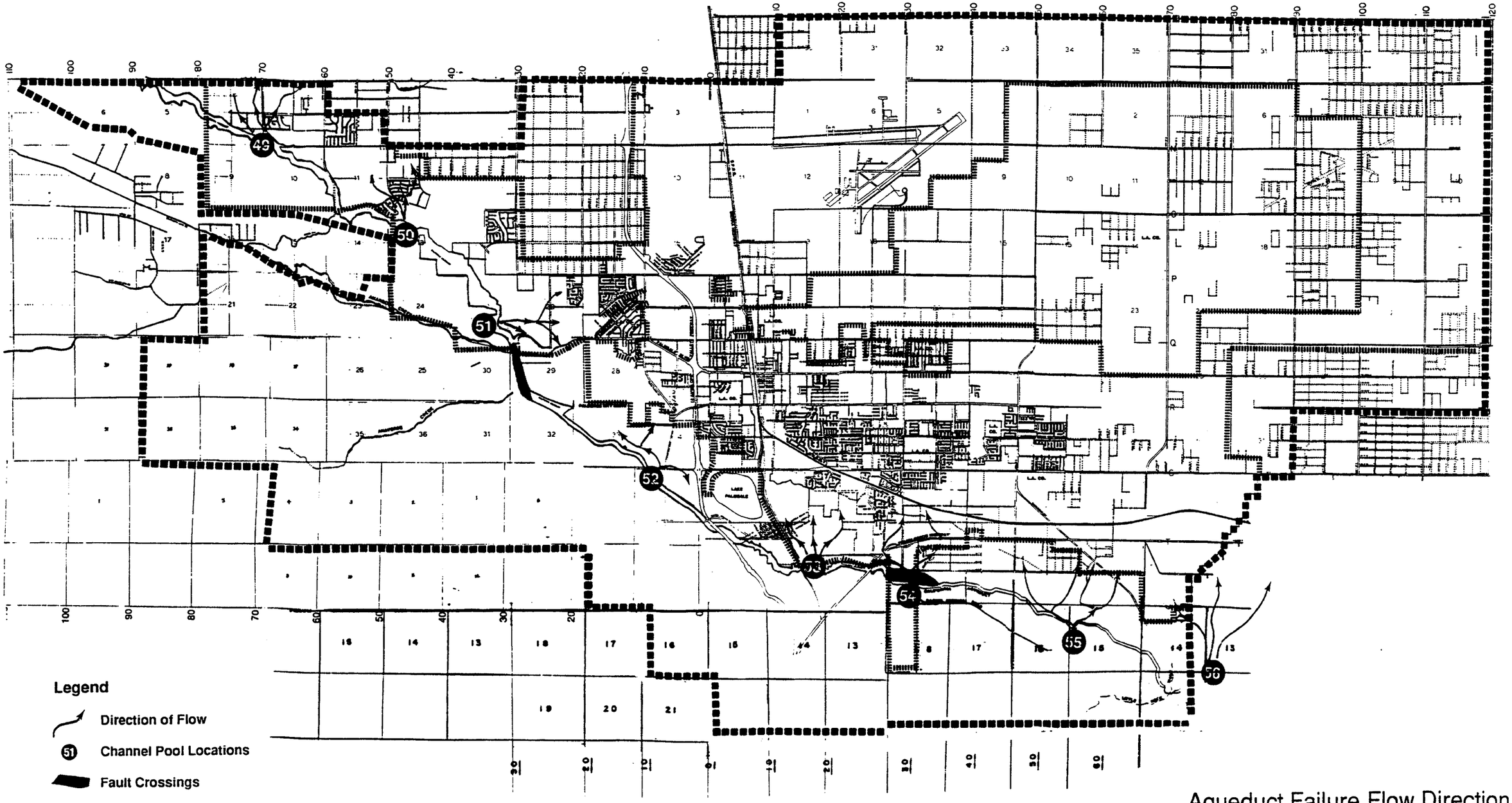
EXHIBIT S-5



Inundation Areas

Palmdale General Plan

Adopted by City Council 1/25/93 **EXHIBIT S-6**

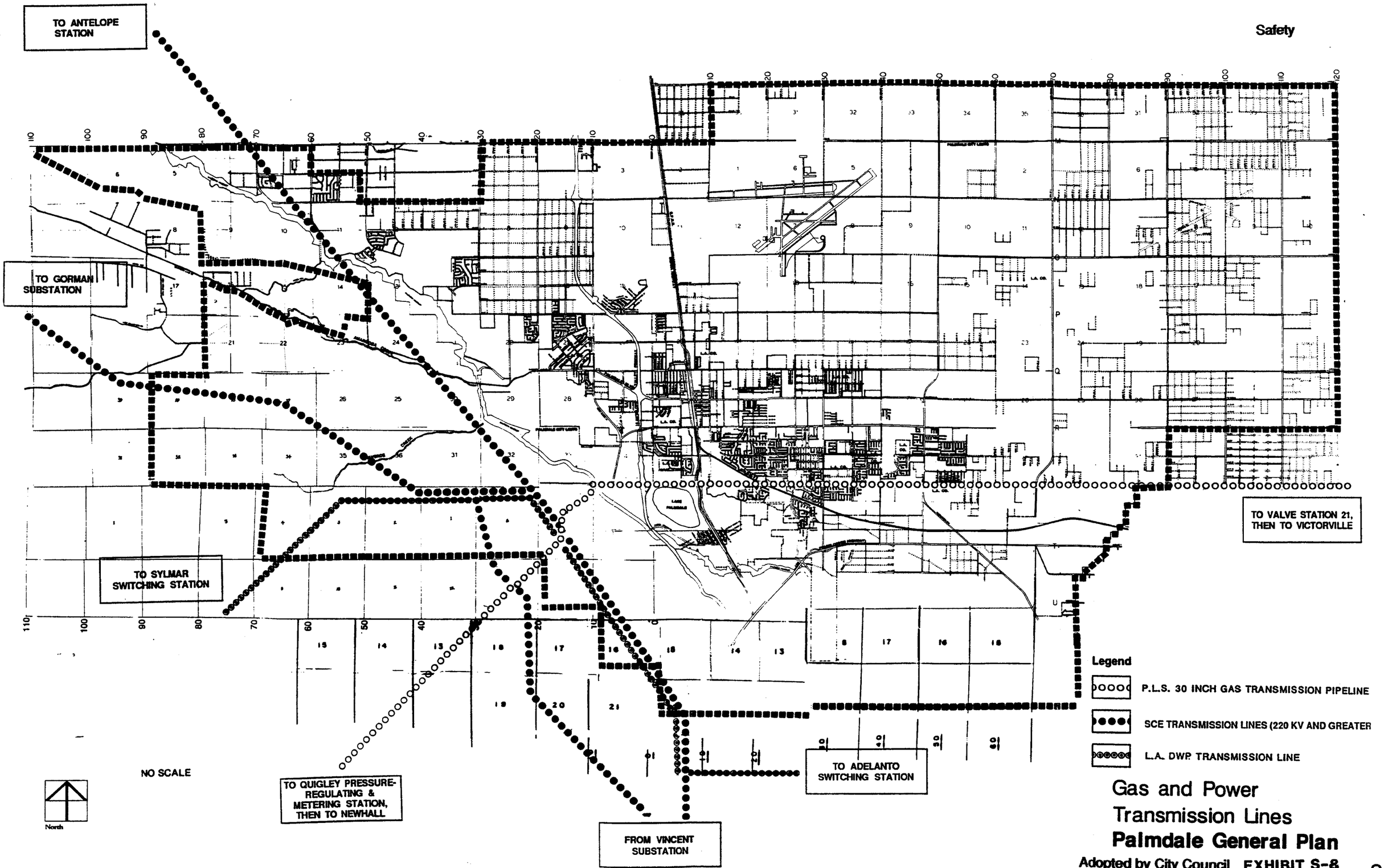


Aqueduct Failure Flow Direction

Palmdale General Plan

Adopted by City Council
1/25/93

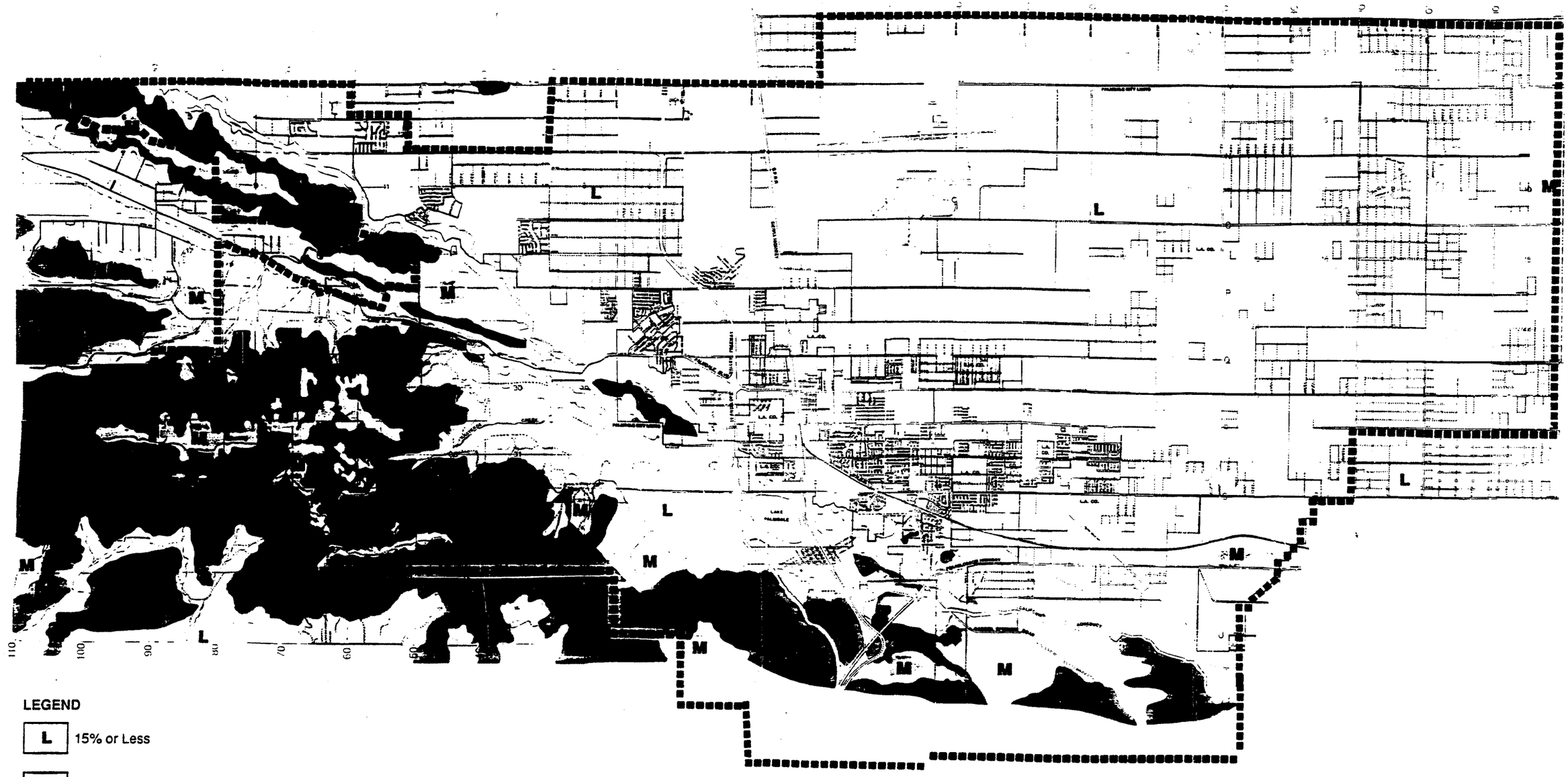
EXHIBIT S-7



Gas and Power Transmission Lines

Palmdale General Plan

Adopted by City Council 1/25/93 **EXHIBIT S-8**



LEGEND

- L — 15% or Less
- M — 15-25%
- 25% or Greater

North

Slope Categories

Palmdale General Plan

Adopted by City Council
1/25/93

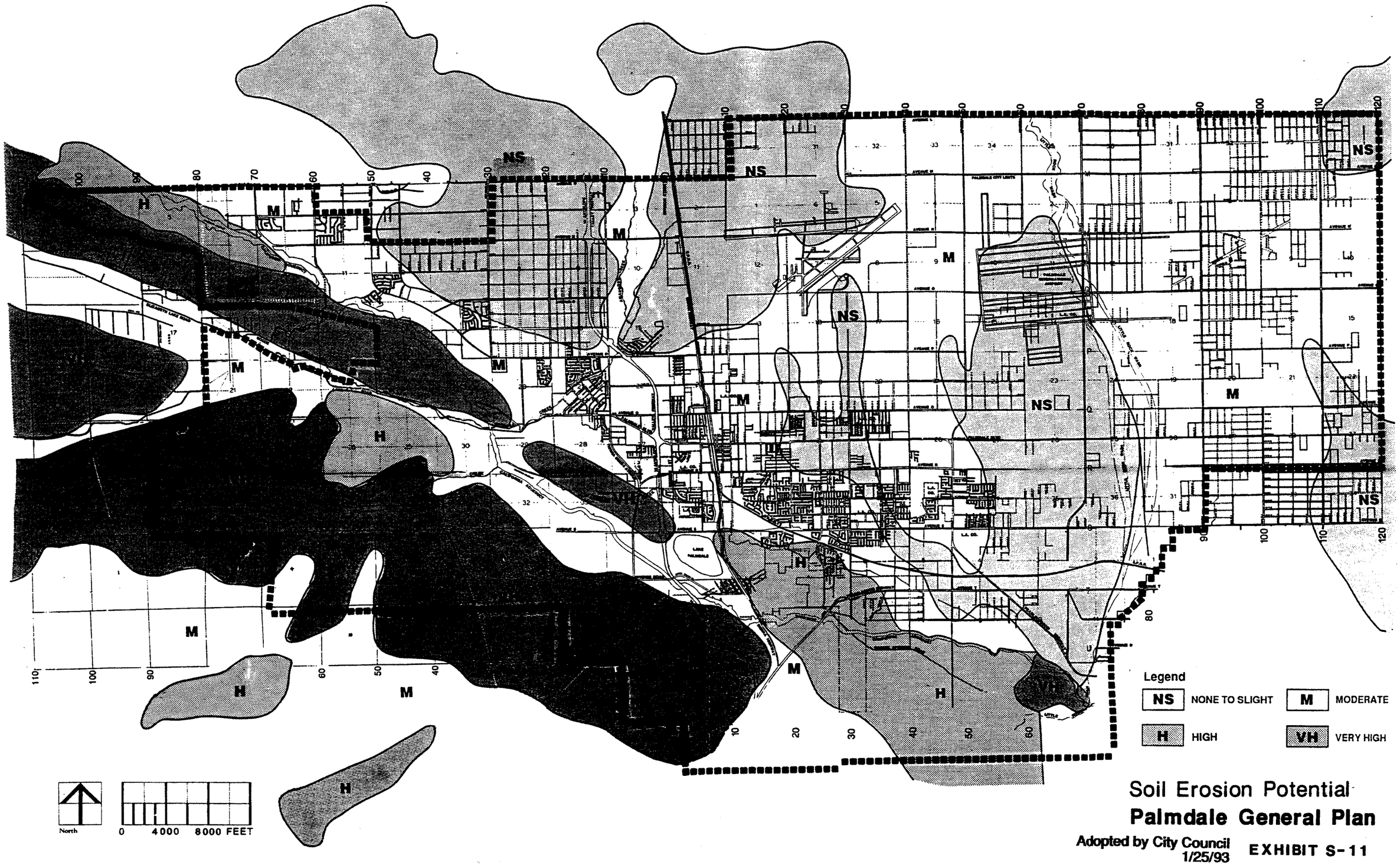
EXHIBIT S-9

Soil Expansion Potential

Palmdale General Plan

Adopted by City Council
1/25/93

EXHIBIT S-10

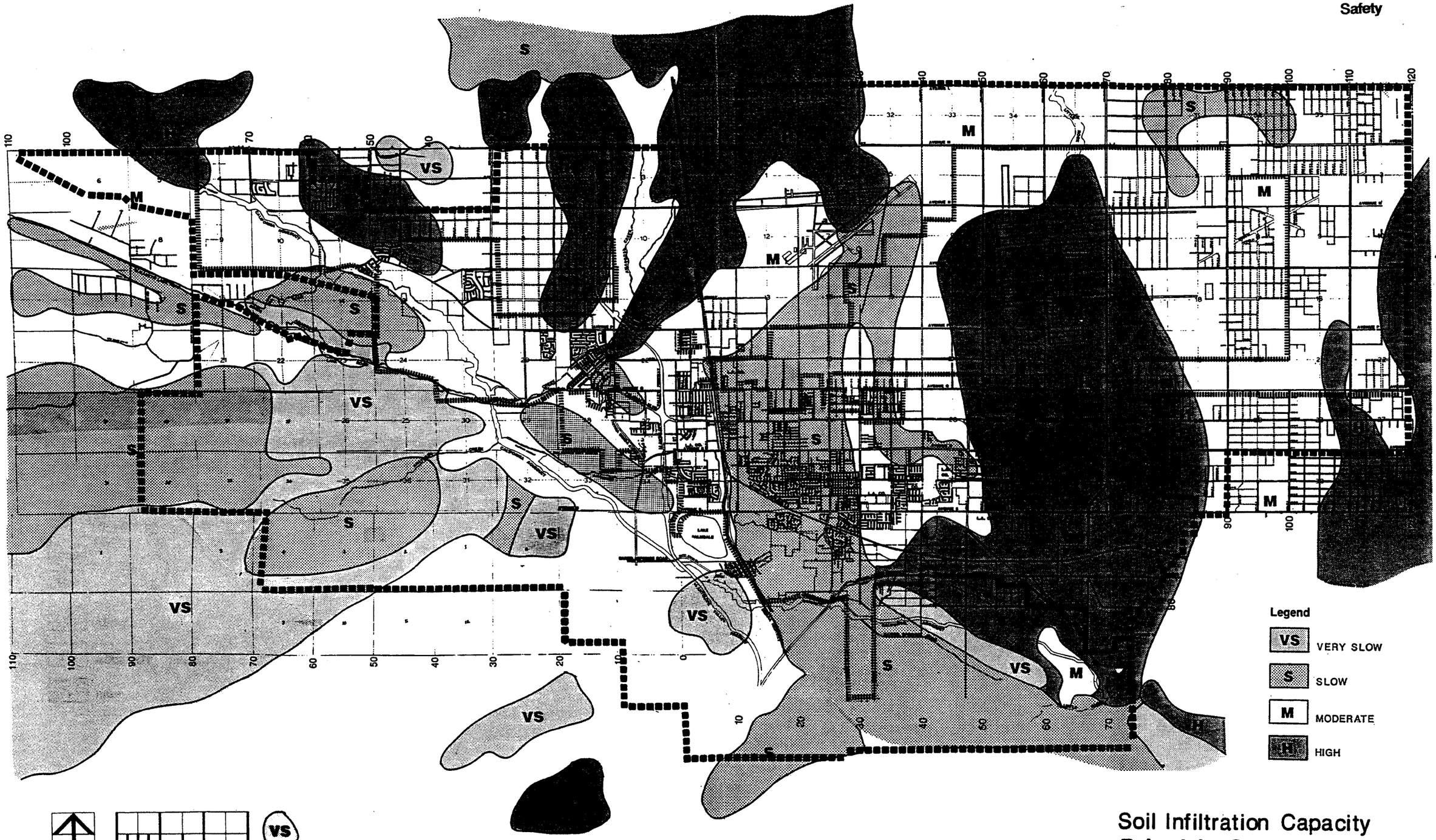


Soil Erosion Potential

Palmdale General Plan

Adopted by City Council 1/25/93

EXHIBIT S-11

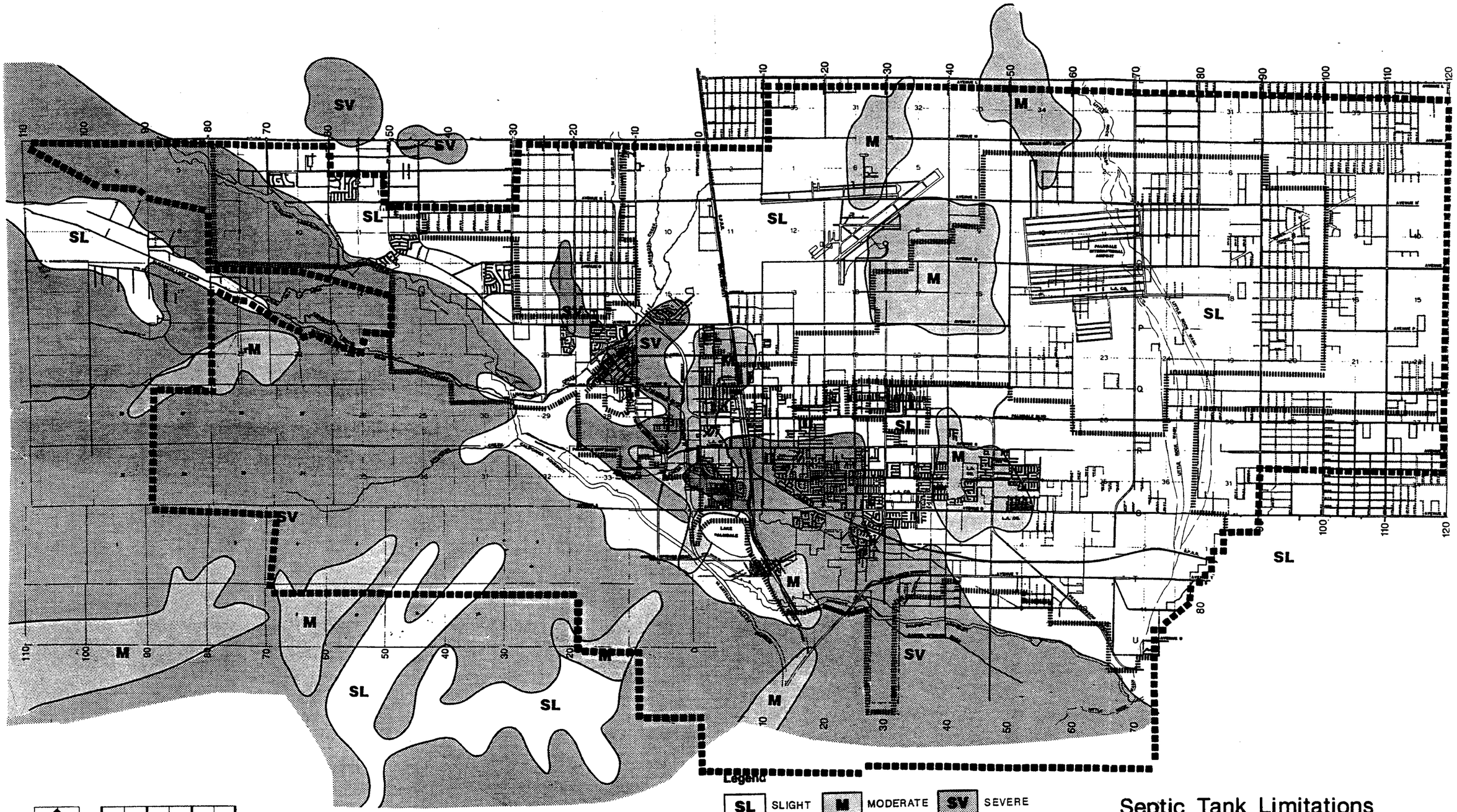


Soil Infiltration Capacity

Palmdale General Plan

Adopted by City Council
1/25/93

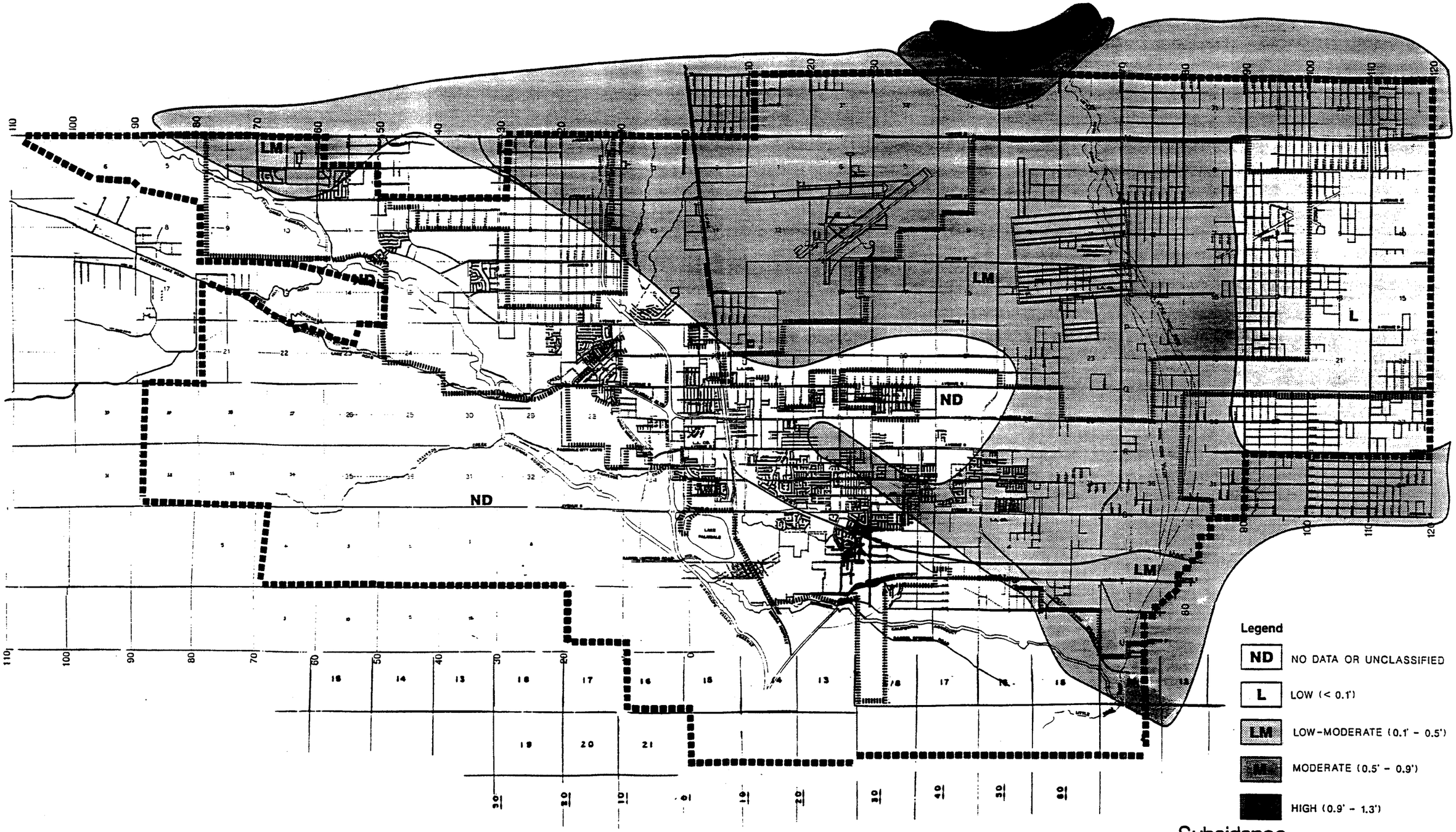
EXHIBIT S-12



Septic Tank Limitations
Palmdale General Plan

Adopted by City Council
1/25/93

EXHIBIT S-13

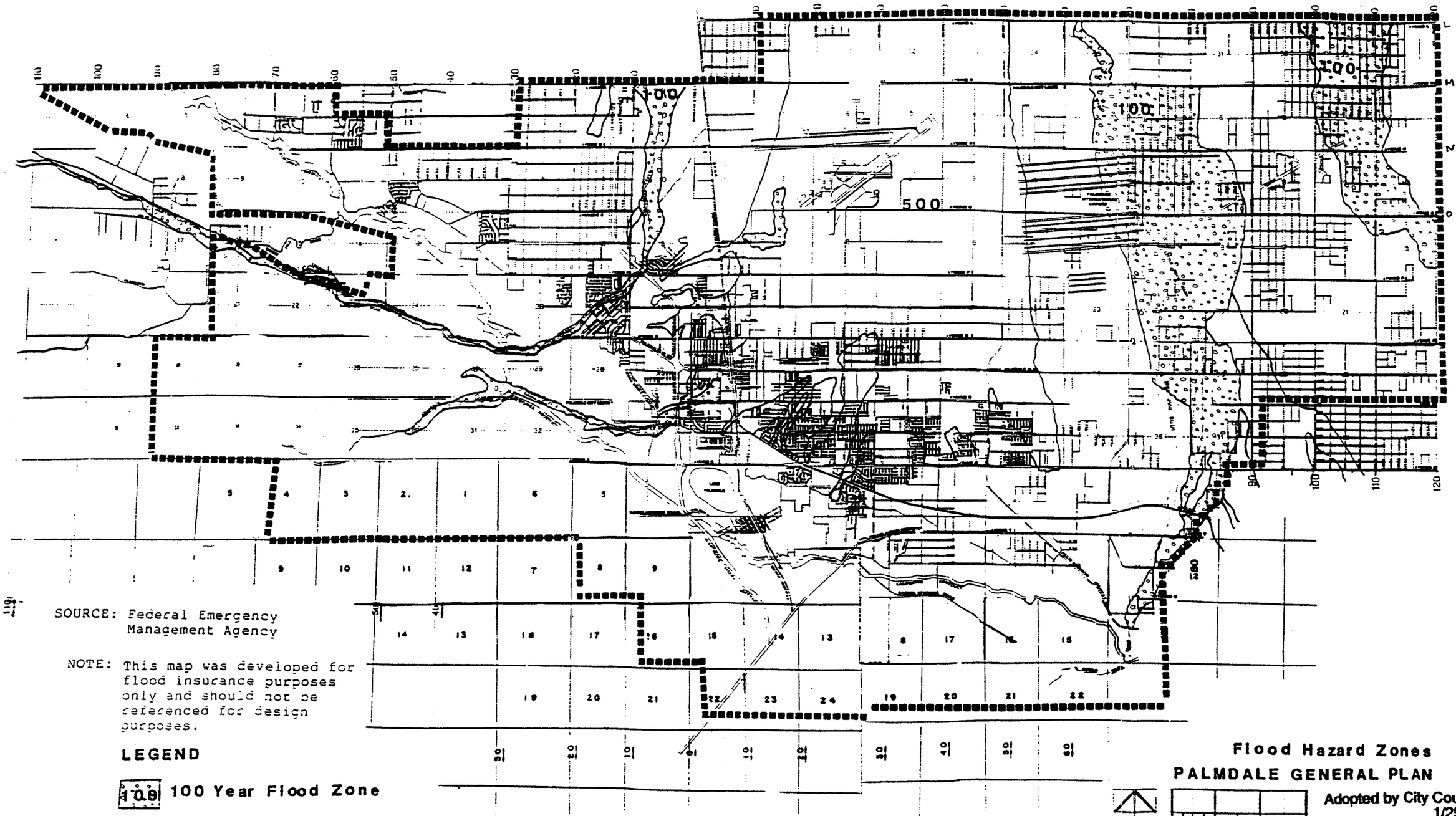


Source:
Los Angeles County Engineer,
1974 Land Subsidence, Antelope Valley Area of Los Angeles County

Subsidence

Palmdale General Plan

Adopted by City Council
1/25/93 EXHIBIT S-14



SOURCE: Federal Emergency Management Agency

NOTE: This map was developed for flood insurance purposes only and should not be referenced for design purposes.

LEGEND

100 **100 Year Flood Zone**

500 **500 Year Flood Zone**

Flood Hazard Zones

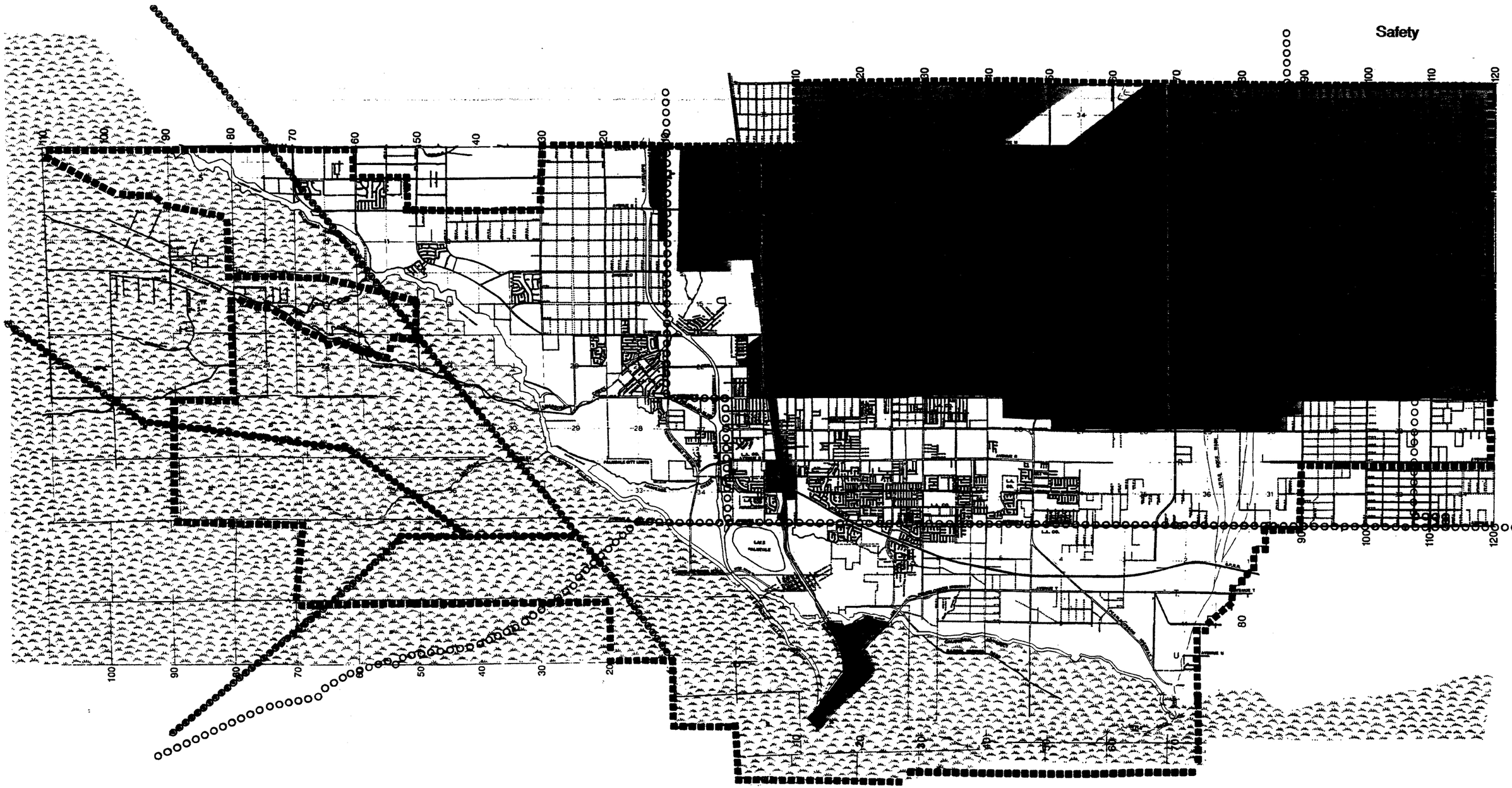
PALMDALE GENERAL PLAN

Adopted by City Council 1/25/93

North

0 4000 8000 Feet

EXHIBIT S-15



Legend

- Designated Industrial Areas
- Fire Zone 4 (Brush Areas)
- Power Transmission Line
- Gas Line

Wildfire Hazard Zones

Palmdale General Plan

North

0 4000 8000 Feet

Adopted by City Council
1/25/93

EXHIBIT S-16

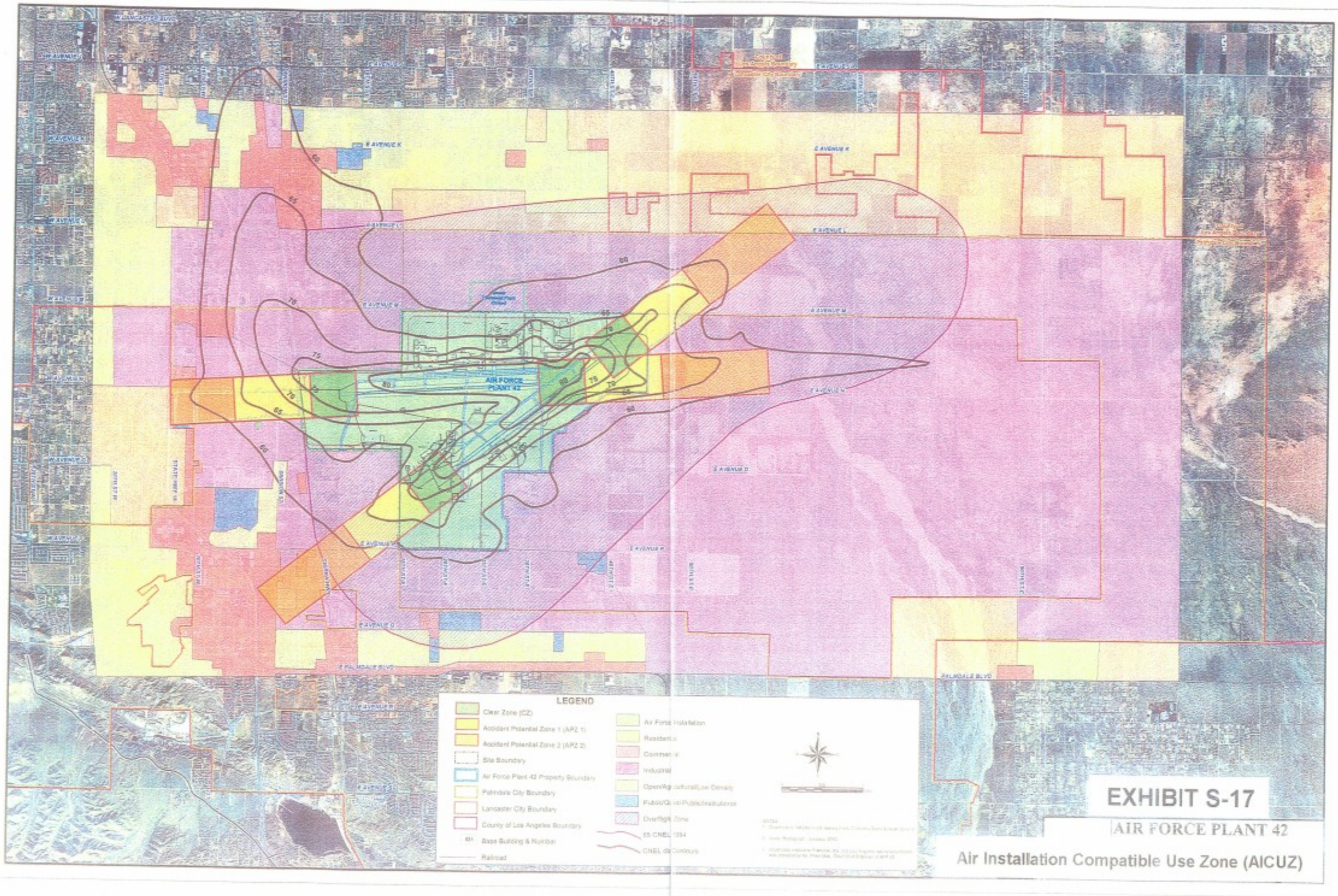


EXHIBIT S-17

AIR FORCE PLANT 42

Air Installation Compatible Use Zone (AICUZ)