

S A F E T Y E L E M E N T

GEOLOGICAL HAZARDS The City of Jackson is located in a low earthquake, (seismic), hazard area. A major earth shaking might occur with a frequency of once in 50 years. The maximum probable intensity of an earthquake in the area, (VII on the Modified Mercalli Scale) is described as:

"Difficult to stand. Noticed by drivers of motor cars. Hanging objects quiver. Furniture broken. Damage to masonry D, including cracks. Weak chimneys broken at roof line. Fall of plaster, loose bricks, stones, tiles, cornices, unbraced parapets, and architectural ornaments. Some cracks in masonry C. Waves on ponds. Water turbid with mud. Small slides and caving in along sand and gravel banks. Large bells ring. Concrete irrigation ditches damaged."

A more likely earthquake, (V on the Modified Mercalli Scale), is described as:

"Felt outdoors; direction estimated. Sleepers wakened. Liquids disturbed, some spilled. Small unstable objects displaced or upset. Doors swing, close, open. Shutters, pictures move. Pendulum clocks stop, start, change rate."

The epicenters of the highest magnitude earthquakes to be felt in this area are likely to be located along the San Andreas and Hayward faults in the Bay Area.

The "Safety and Seismic Safety Element" prepared for the Amador County Unit of the Central Sierra Planning Council describes the geologic problems in the Jackson area as:

earthquake shaking	LOW
flooding	NONE
volcanic eruption	NONE
fault displacement	LOW
landslide	MODERATE
subsidence	NONE
erosion activity	LOW
expansive soils	LOW
loss of minerals	NONE

The Jackson planning area is located on the "Mother Lode" portion of the Sierra Nevada foothills. The Melones Fault lies about one-half mile to the east along the boundary between the Calaveras and Amador formations. The Bear Mountain Fault is located about two miles to the west along the boundary between the Calaveras Formation and the Logtown Ridge. Neither fault is active and the chance of surface rupture is slight. The major geological features are illustrated on the map on the following page. The geological history is described in Appendix S-A, page S-A-1.

Gold mining, lode or hard rock, has been a significant contributor to the economy of the Jackson area in the past, especially at the Kennedy and Argonaut mines. Those mines were closed during World War II as part of the wartime restrictions. Even with the current price of gold, it may not be feasible to reopen such mines.

The mine shafts and glory holes of old mines are man-made hazards, particularly the prospects that were too small in production or too little worked to be noted on the records. The old mines, especially the unrecorded ones, create potential problems of dangerous openings, cave-ins and subsidence.

Additional man-made hazards are pre-1955 structures built of masonry and chimneys, cornices, and second story porches where reinforcing was not provided to withstand seismic stresses and major storms. Many of the older structures, both masonry and wood frame, are historic and should be preserved but they need rehabilitation to provide structural safety, fire safety, sanitation facilities, and adequate exits in order to be used as places of public assembly.

STEEP SLOPES Due to the high angles of tilting in many of the rock sequences found in the Jackson area great care must be taken in making open cuts in rock slopes. Professional geophysical-geological advice is needed to avoid creating hazardous new rock slides.

Two existing large cuts are located on the western side of Highway 88-49: one adjacent to the southern side of the Safeway market, the other on the northern side of the Busi Municipal Parking Lot. While the southern cut is quite stable, the rock slides in portions of the Busi cut are obvious. One can clearly see the fracturing, joint systems, and tilting of the rock strata north of the parking lot.

The bedrock in the Jackson area has undergone fracturing, tilting, faulting, and weathering creating areas of instability where there are steep slopes or open cuts. Where slopes of over 20% occur or are proposed, careful consideration must be given to any change in the land forms and to the uses to be placed or maintained on or near the steep slopes. An engineering report should be provided for all new structures to be located on or near slopes in excess of 20% and for all grading on or creating such slopes. The slope gradients in the planning area are shown on the map on the following page.

The steep slopes are also the location of possible dangerous wildfires of natural vegetation. Because of the inaccessibility the vegetation is usually allowed to grow rankly providing considerable fuel in many years when there have been favorable weather conditions. The inaccessibility of the site frequently hampers firefighting. Adequate clearing of vegetation is needed around structures and land uses that would suffer severe damage from wildfires on the steep slopes.

RANCHO SECO The Sacramento Municipal Utility District's nuclear power plant, RANCHO SECO, is located about twenty miles westerly from the center of Jackson. The Jackson planning area is in the "Extended Emergency Planning Zone" of the plant established by the California Office of Emergency Services, (OES). These zones extend up to 35 miles around the nuclear power plants in the state based on an OES study describing consequences of accidents in such power plants.

Each county in the affected area is to develop an emergency response plan by April, 1981, to include shelter and evacuation procedures and other protective measures which could be taken if an accident occurs. The plans would include ways for preventing contaminated milk, crops, and livestock from reaching consumers. If evacuation became necessary in the Jackson area, the state highways running to the east and south, 88 and 49, are the only major roads available.

The City of Jackson is supportive of the nuclear power plant and its operation and does not intend for anything contained herein or in the adoption of any emergency planning measures to be construed as a negative comment on Rancho Seco. The City looks favorably upon such plants as a safe and cost-effective means of providing energy.

WATER SUPPLY AND FIRE PROTECTION The water supply serves three kinds of consumption: potable, irrigation, and fire fighting. The current supply is delivered by Pacific Gas and Electric Co. via open ditch to the Kennedy Reservoirs of the Jackson Water Works division of the Citizens Utilities Company. After treatment for domestic use, it is piped throughout the Jackson-Martell developed area.

The entitlement from the P.G. & E. supply is more than 1,300,000 gallons per day. An average day's distribution by the Jackson Water works in 1980 was over 400,000 gallons. The highest normal daily demand has been about 745,000 gallons. The peak consumption has been about 1,000,000 gallons per day, about three quarters of current average daily entitlement. The distribution system could deliver about five times the average daily use or more than one and a half times the average daily entitlement.

For domestic use there appears to be no safety problems with the quality or quantity of water supply during the current planning period. The developers of new sites will need to provide extensions of the distribution system to serve their projects including the off site trunk lines which will be needed to provide the required fire flows within the projects.

The maximum supply is needed for fire fighting purposes. New developments are required to install the distribution system needed to meet the Public Utility Commission's regulations or the City's requirements.

Due to the approximately 500 feet difference in elevation of the land in the service area there are bound to be significant differences in pressure in the system in spite of pressure control valves. The valves restrict the volume of the supply passing that point as well as preventing excess pressure in the lower areas. The Fire Chief noted potential supply or pressure problems as shown on the map on the following page.

There are two major conflagration hazards: one would be a major fire in the historic central business district where there are few large open spaces between buildings; the other could occur in any built up portion of the area if a broad area wildfire occurred during an extremely dry spell with a high hot wind. In the C.B.D., retrofitting the old historic buildings with sprinkler systems and fire doors would alleviate the problem. Prevention of the accumulation of dry grass and brush throughout the community would reduce the risk of wildfire damage.

Fire fighting is difficult in the Jackson area because of the steep grades. Also, there are several narrow roadways and local access streets without turnaround areas in which the fire fighting equipment can manoeuvre safely. Where the access streets are inadequate for fire protection purposes, the adjoining property owners need to evaluate the relative cost of street improvements and the reduced risk of fire and other hazards.

The water distribution company has considered the vulnerability of the supply source and has determined that there are several existing wells which could provide an alternate supply to the existing open ditch system. In the long range future if safety or growth needs require it, such wells could be used to supplement or replace the present supply. The company's priority operation is to maintain the present distribution system in good repair. Replacement lines are installed on an "as needed" basis within budgetary capability. The company also works with the developers of new sites in designing the trunk lines and local distribution lines needed to provide service to those areas.

It is the policy of the City of Jackson to inform the public of the need for prompt removal of trash, grass, weeds, and dry brush that could furnish fuel to a conflagration.

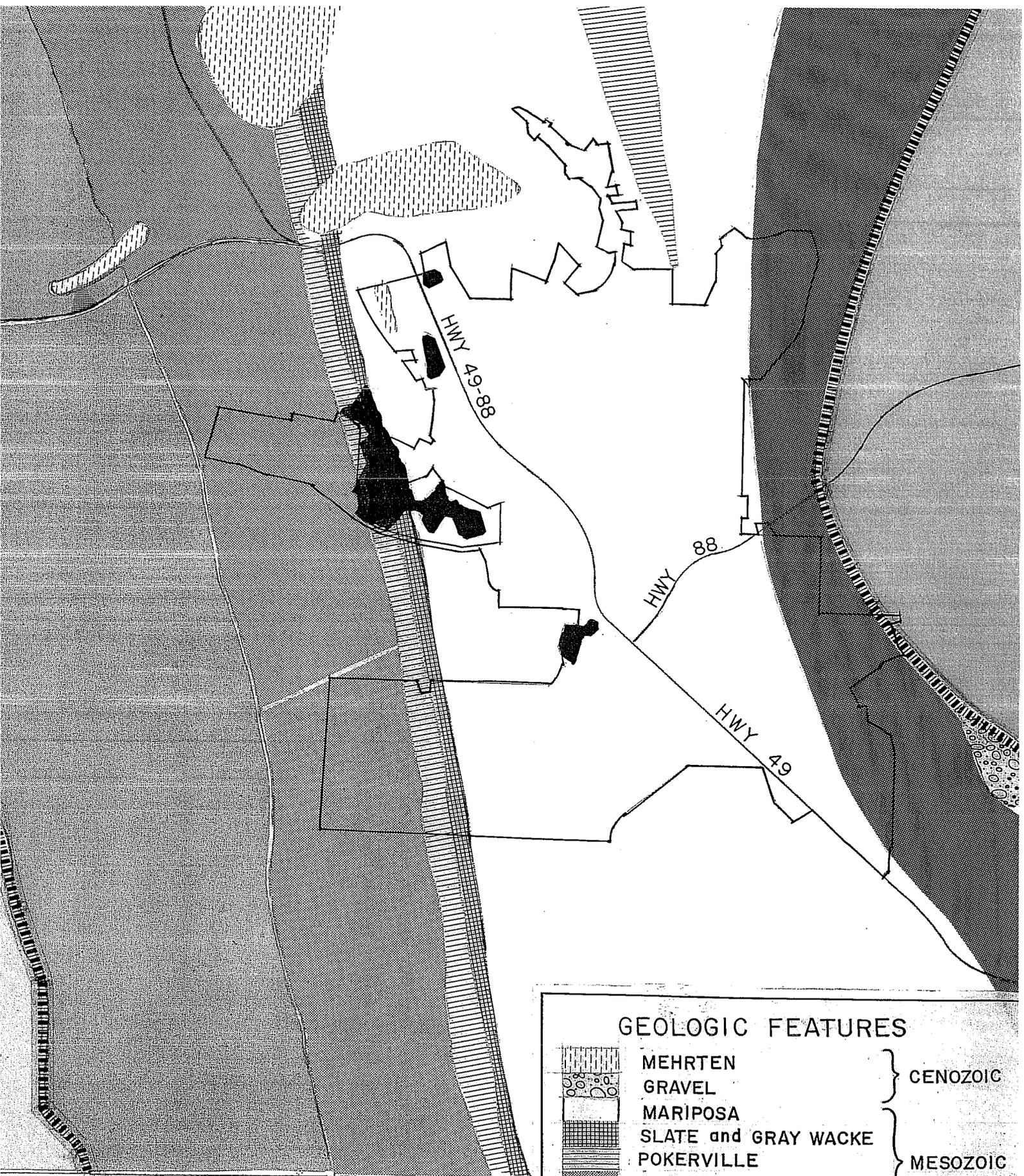
It is the policy of the City of Jackson to inspect all multistory buildings, all places of public assembly and all masonry buildings built before modern structural requirements for safety were enforced; and to promote the retrofitting of such structures with reinforcement, sprinklers, fire doors, exits, and modern safety devices to enhance the safety of the users of the premises and to prevent conflagrations.

FLOODING The historic center of the Jackson area is the junction of the branches of Jackson Creek into the main stream. There are no major dams located on the creeks upstream from the City. Flooding is confined to narrow areas along the streams, typically less than 150 feet wide, as shown on the Flood Hazard Boundary Map of the City of Jackson, California, (revised May 8, 1979), published by the Federal Insurance Administration of the U.S. Dept. of Housing and Urban Development. The flood waters seldom rise above the natural high banks of the streams. In the central business district, portions of the natural banks have been replaced with masonry walls and in a few places the North Fork has been covered over with buildings.

It is the policy of the City of Jackson: (1) to maintain the storm drainage capacity of the floodway along Jackson Creek and its branches; (2) to promote the maintenance of the floodway clear of trash and debris that would detract from the appearance of the area and might reduce the drainage capacity of the natural channel; and (3) to maintain surveillance of the floodways to ensure that encroachments or alterations do not occur which would reduce the drainage capacity of the floodways or alter the forces of the flood waters, creating new erosion patterns which would damage property.

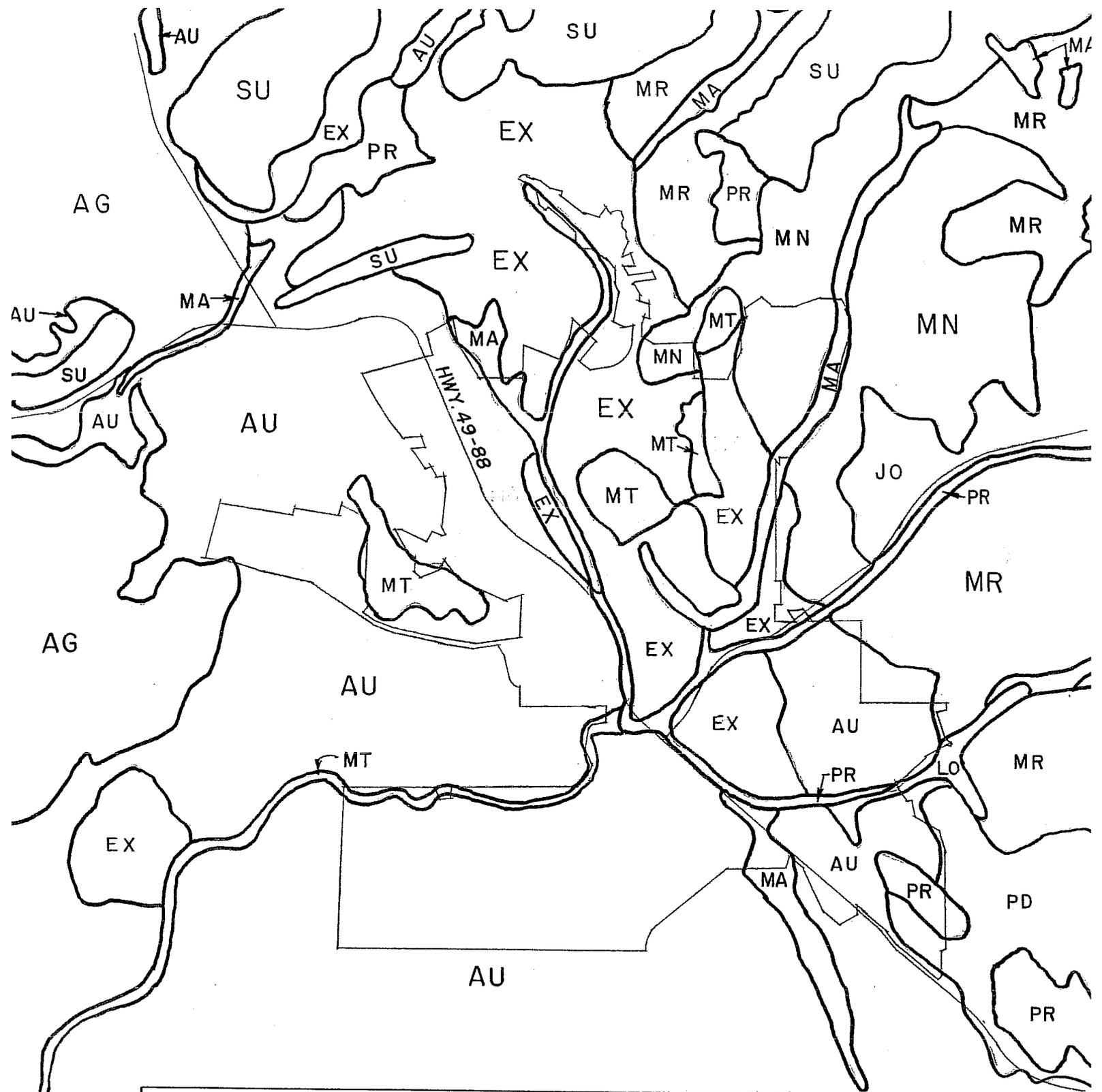
HAZARDOUS OR TOXIC MATERIALS There are no known sources of especially hazardous or unusual toxic wastes. The State and County regulations regarding the handling, storage, transportation, use, and disposal of toxic and hazardous materials should ensure that a problem does not develop. It is the policy of the City of Jackson to have its inspectors and officials report suspected cases of violation of the regulations controlling such materials to the County Health Department.

As a general safety measure it is the policy of the City to maintain by-pass streets roughly parallel to the State Highways for use in emergencies by non-local traffic when the highways are temporarily blocked.



CITY OF JACKSON
AMADOR COUNTY, CALIFORNIA
GENERAL PLAN

GEOLOGIC FEATURES		
	MEHRTEN GRAVEL	} CENOZOIC
	MARIPOSA SLATE and GRAY WACKE	
	POKERVILLE	} MESOZOIC
	GOAT HILL	
	RABBIT FLAT META	} PALEZOIC
	CALAVERAS TAILINGS	
	FAULT TRACE	



SOILS

AG	ARGONAUT
AU	AUBURN
EX	EXCHEQUER
JO	JOSEPHINE
LO	LOAMY LAND
MA	MIXED ALLUVIUM

MN	MAYMEN
MR	MARIPOSA
MT	MINE TAILINGS
PD	PARDEE
PR	PLACER DIGGINGS
SU	SUPAN

GENERAL GEOLOGICAL HISTORY

Appendix S-A

The oldest rocks of Amador County are the result of marine sediment deposition with subsequent metamorphism during Permian time of the Paleozoic era. These rocks are known as the Calaveras Formation which consists of: metachert, greenstone, quartzite, slate, greenschists, and limestone. At the end of the Paleozoic era the marine basin was partially destroyed and a mountain chain created.

By the middle of the Jurassic era the sea again covered Amador County. This marine deposition is identified as the Cosumnes member of the Amador Formation, but it is not evident in the immediate Jackson area. Submarine vulcanism also took place resulting in the Logtown Ridge formation of the Amador rock group. Those evident are coarse mafic volcanic breccia, tuff, agglomerate and andesite, (greenstone). Further sedimentary deposition gave rise to the Mariposa Formation: a strata of dominantly grey slates, tuff, graywacke, and conglomerate.

The end of the Jurassic period brought extensive crustal deformation resulting in the withdrawal of the sea and the rise of a folded mountain range. Concurrent with the destruction of the sea basin was the intrusion of peridotite, (now serpentine), into the marine sediments. Granitic rocks were emplaced during the end of the folding sequences, giving rise to faulting and resultant hydrothermal vein deposition of gold, copper and zinc.

By the onset of the tertiary era the folded Sierra Nevada mountains had undergone severe erosion for 20-30 million years creating broad river valleys and low elevations. The hydrothermal veins were also deeply eroded causing heavy metal placer deposits in the ancient stream channels. Continuous attack on the bedrock caused deep weathering, resulting in extensive clay and quartz sand deposits. The sub-tropical climate of the time is also responsible for forming deposits of lignite.

Extensive vulcanism occurred in the middle of the tertiary period. So much ash fell that the stream channels were buried and the whole drainage system was altered. Subsequent stream channels are lean by comparison to the ancient Tertiary pre-volcanic channels in quantity and quality of placer deposits.

In the late Tertiary and through the Quaternary periods major uplifting, glaciation, erosion and deposition contributed to the present day physical topography.

The three major rock sequences found in the vicinity of Jackson have direct control on the resultant soil types.

CALAVERAS These marine deposits are exhibited as highly contorted, poorly bedded, blackish-grey recrystallized cherts and quartzites. Also present in smaller amounts are greenstones, low grade carbonaceous slates, mica schists, and limestone. These strata strike north to northwest with a high angle of dip to the east. From these parent rocks the following soil series developed: Auburn, Exchequer, Josephine, Mariposa, and Maymen.

AMADOR (COSUMNES & LOGTOWN) Cosumnes is stratigraphically the lowest and consists of metamorphosed sandstones, conglomerates and volcanics. The upper sequence, Logtown Ridge, has fine grained

volcanic andesitic porphyries, tuff and slate. Upon decomposition these rocks yield the Argonaut, Auburn, and Exchequer soils.

MARIPOSA This formation is dominated by marine sediments that have been metamorphosed into slate. Upon decomposition Auburn and Exchequer soils are also produced.

See the map following page 0-1 for Soils of the Jackson study area. See Appendix S-B page S-B-1, Soil Characteristics, for a summary of each soil type and their potential hazards and agricultural suitabilities.

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Appendix S-B SUMMARY OF SOIL CHARACTERISTICS

Soil & Symbols	General Description	Potential Hazards	Agriculture
Argonaut AnD, AoD	Undulating up to hilly soils, outcrops up to 25% of surface, rocks up to 25% of soil, slope up to 31%. Soil less than 1 ft.	Moderate to severe erosion, high potential for post construction settlement, severe limitation for septic fields.	Rangeland, limited vineyards, irrigated pasture.
Auburn ApD, AsD, AsE, AtE, AtD, AuD, AvE, AxD, ArC	Nearly level to very steep, 5 to 40% outcrops on steep slopes, slopes to 71%. Soil less than 1 ft.	Moderate to very severe erosion, cracks readily upon settling, severe limitations for septic tanks.	Rangeland.
Exchequer EcD, ExD, ExE	Undulating to steep, metabasic outcrops up to 50%, slopes to 31%. Soil less than 1 foot.	Very severe erosion, cracking, settlement, severe limitations for septic tanks.	Limited grazing, browse for wildlife.
Josephine JsE	Undulating to steep, slaty fragments, slopes to 51%. Soil to 3 feet.	Moderate erosion, high degree of settlement cracking, moderate limitations for septic tanks.	Timber, summer grazing, small family orchards.
Mariposa McE, MdE, McD, MbD	Gentle to steep, schist outcrops on steep slopes, slopes to 51%. Soil to 2 feet.	Severe to very severe erosion, high cracking, severe limitations for septic tanks.	Timber, grazing
Maymen MhE	Hilly to steep, tilted slates, common outcrops, slopes to 51%. Soil to 1 foot.	Severe to very severe erosion, high cracking, severe limitations for septic tanks.	Protected watersheds, wildlife areas, limited grazing.
Mine Tailings Mn	Very stoney in rivers and creeks.	Subject to flooding.	
Mixed Alluvial Mo	Alluvial terraces near creeks.	Subject to flooding and cracking.	Grazing, timber.
Placer Diggings Pw	Poorly sorted stones near dams and streams.	Subject to flooding.	Limited grazing.
Pardee PaD	Gravelly loam 2 feet deep over weathered conglomerate. Slopes to 31%. Fragments up to 60% of soil mass.	Moderate to severe erosion. Severe limitation for septic tanks.	Grazing.
Loamy Alluvial Lo	Recent alluvial deposits adjacent to streams.	Subject to flooding. Severe limitations for septic tanks.	Home orchards, gardens, irrigated pasture.
Supan SyD, SdX, SyE	Undulating hills to steep. Cobbly loam 1 to 5 feet over weathered conglomerate. Slopes to 51%, cobbles to 50% of soil mass.	Moderate to severe erosion. Moderate limitations for septic tanks.	Grazing, limited vineyards.