

Landslides: As in the case of Nueva Choluteca, this site is on practically flat ground, hence no landslide hazard is perceived to be present here.

Water Supply: Water for this site can probably be provided by wells producing from the alluvial aquifer. Such wells should produce about 160 gpm. However, analysis of water produced from the shallow alluvial aquifer in and near the urban area of Choluteca has shown that many are contaminated with bacteria. Another possible source of pollution at this site is the adjacent dump. It is recommended that any wells at this site be drilled as far as possible from the dump or any known areas of bacterial contamination. Only one well should be required at this site, with the cost approximately \$15,000.



Construction has commenced at Nueva Eden

Sanitary: An oxidation pond is being planned for this site. This option is recommended as a minimum.

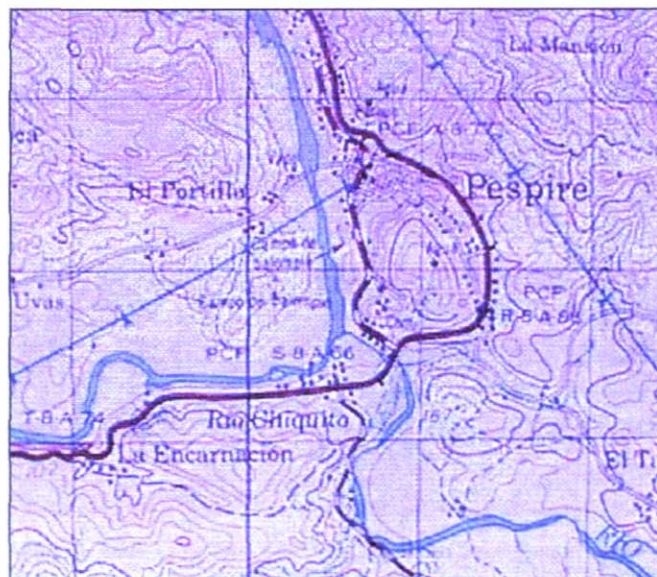
Environmental: Development of the site would have limited environmental impacts. There was no watercourse nearby to receive effluent from the oxidation pond. Design of the treatment system should consider environmental effects.

Site Access: Access to the proposed site is through existing municipal roads and is deemed adequate.

Pespire

General

The city of Pespire is located along the left (west) bank of the Rio Nacaome. The city is in the Department of Choluteca, which in 1997 listed its population as 377,241. Housing losses in the Choluteca Department were reported as 4,400 homes destroyed and 6,600 homes damaged.



Description of Problem

Flooding from the Rio Nacaome and Rio Chiquito, which enters the Rio Nacaome immediately downstream of Pespire, caused extensive flooding, destruction of homes, and sediment deposition in the city following Hurricane Mitch. Reported rainfall amounts were 893 mm (35 inches) in downstream Choluteca and 254.1 mm (10 inches) in upstream Tegucigalpa.

Landslides

Although landslides are evident throughout this area, no landslides directly affected the town of Pespire.

Flooding

Extensive flooding and sediment deposition occurred in low lying areas of Pespire along the Rio Nacaome and Rio Chiquito.

Mitigation Measures

- *(Short Term)* It is recommended that those areas closest to the river which were destroyed during the flood not be re-built. These flat areas showed evidence of extremely high velocities and flood depths, and as an active part of the floodplain should not be re-inhabited.
- *(Short Term)* Those housing areas located on the lower slopes of Pespire and damaged by the flood may be repaired/rebuilt. These areas should expect to be flooded periodically, but the flooding should occur infrequently
- *(Short Term)* It is not recommended that any dredging of the river channel be accomplished at Pespire.



Sediment deposition was severe in Pespire, as it was in most of Honduras following Hurricane Mitch.

Evaluation of Proposed Housing Sites

Pespire

Flooding: The lowest point of the proposed site is approximately 2 meters higher than the maximum flood stage of the Rio Chiquito. Hence, it is unlikely that flooding due to high-river flow will occur. The site is relatively steep and will require a local drainage system to prevent both erosion and localized flooding.

Landslides: The site encloses a small and steep ridge (sideslope valley) watershed system. Topographic convergence and the steep slope cause



The proposed housing site at Pespire is located above the floodplain.

approximately one third of this site to be susceptible to debris flows. Moreover, small (<50 m³) debris flows were observed in the upper reaches of the site, but they seem not to have advanced more than 10 m downslope. We recommend that the upper reaches of this watershed remain off limits to livestock and irrigation. The Rio Nacaome at Pespire appears to have little influx of sediment produced by landslides. Therefore, we deem it unnecessary to analyze landslide contributions to the sediment production in this area. This proposed housing site is located adjacent to a cemetery on a hillside overlooking the confluence of the Rio Chiquito with the Rio Nacaome. The only geologic hazards present at the site are some small debris flows on the slope above the north side of the site. It is advised that housing not be constructed near the base of this slope.

Water Supply: Local groundwater is not considered to be a reliable source of water for this site. However, the local authorities plan to provide water from the same source that supplies Pespire. This source is located approximately 6 kilometers to the southeast at El Tablado, and consist of two wells drilled in an alluvial aquifer located at the junction of Rio Baire and Rio Sacamil. The only direct cost for water at this site is that required connect to the Pespire system.

Sanitary: An oxidation pond is being planned for this site. This option is recommended as a *minimum*.

Environmental: Except for the adverse water quality effects of sewage effluent, development of this site should have limited environmental impacts.

Choloma

General

The City of Choloma is located in the western portion of the Sula River Valley, approximately midway between Puerto Cortes at the northern end of the valley, and Villanueva at the southern end of the Valley. The Sula Valley is a major contributor to the overall Honduran economy. Agriculture and industrial production in the Sula Valley represents approximately 50 percent of the Honduran Gross Domestic Product (GDP). The Valley also is responsible for approximately 40 percent of Honduras's total agriculture production, the Country's most important economic sector. The City lies within the Cortes Department, which is the second most populated department in Honduras. In 1997, population of the department was 846,098.



The levee along the Rio Chamelecon overtopped and breached in several locations.