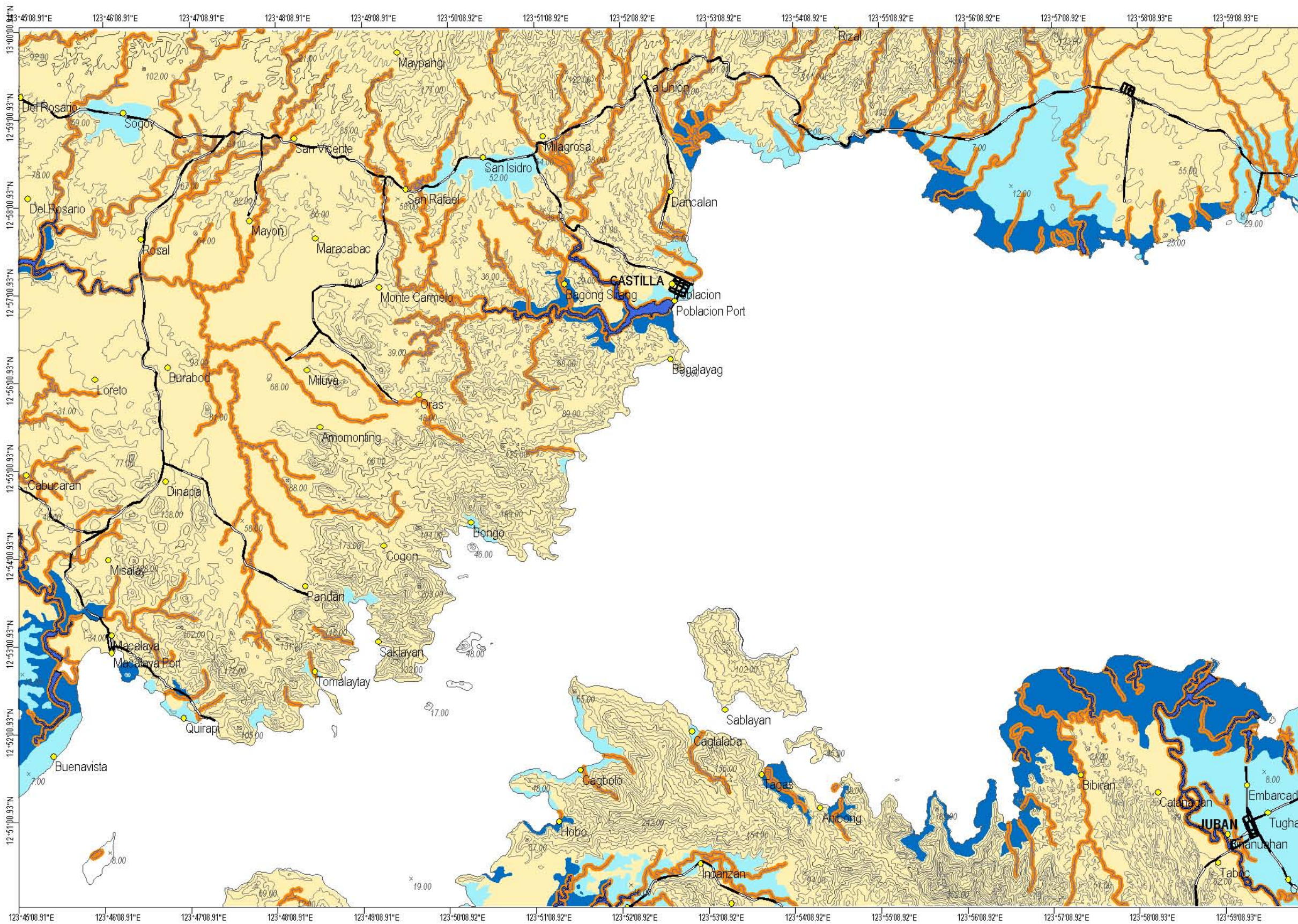


FLOOD HAZARD MAP OF CASTILLA QUADRANGLE



MAP LEGEND:

Hazard Susceptibility Zones:

- Regularly to frequently flooded areas
- Occasionally to rarely flooded areas
- Non flood prone areas
- Areas prone to bank erosion

— contour
 - - - fault
 — river
 — road

EXPLANATIONS:

Flood hazard susceptibility zones were derived based on the geomorphological analysis of landforms and fluvial system. Information on flood occurrences, flood depths, duration of inundation as well as topographic information supported the geomorphologically-based flood hazard mapping.

Regularly to Frequently Flooded Areas:
 Areas that are frequently flooded. Mere heavy rains of 1 to 2 days could bring about flooding in these areas. Moderate to strong typhoons could submerge these areas 0.5 to 2.0 m. in flood waters for a few days to a few weeks. Development of urban settlements in these areas is not recommended.

Seasonally to Rarely Flooded areas:
 Areas that become inundated during moderate to strong typhoons. Flood depths vary from a few centimeters to 1.0 m. Floods last from few hours to a few days.

Non Flood Prone Areas:
 Areas with no reported flood occurrences.

Fied data collection by: M.R.M. Rint
 Geomorphological interpretation by: M.R.M. Rint
 Digital cartographic processing by: E. Laguerta & B. Malto
 GIS processing by: M.R.M. Rint
 Checked by: A.E. Daya
 Approved by: R.A. Juan

Other sources of information:
 1:50,000 NAMRIA Topographic Map
 1951 B/W Aerial Photos



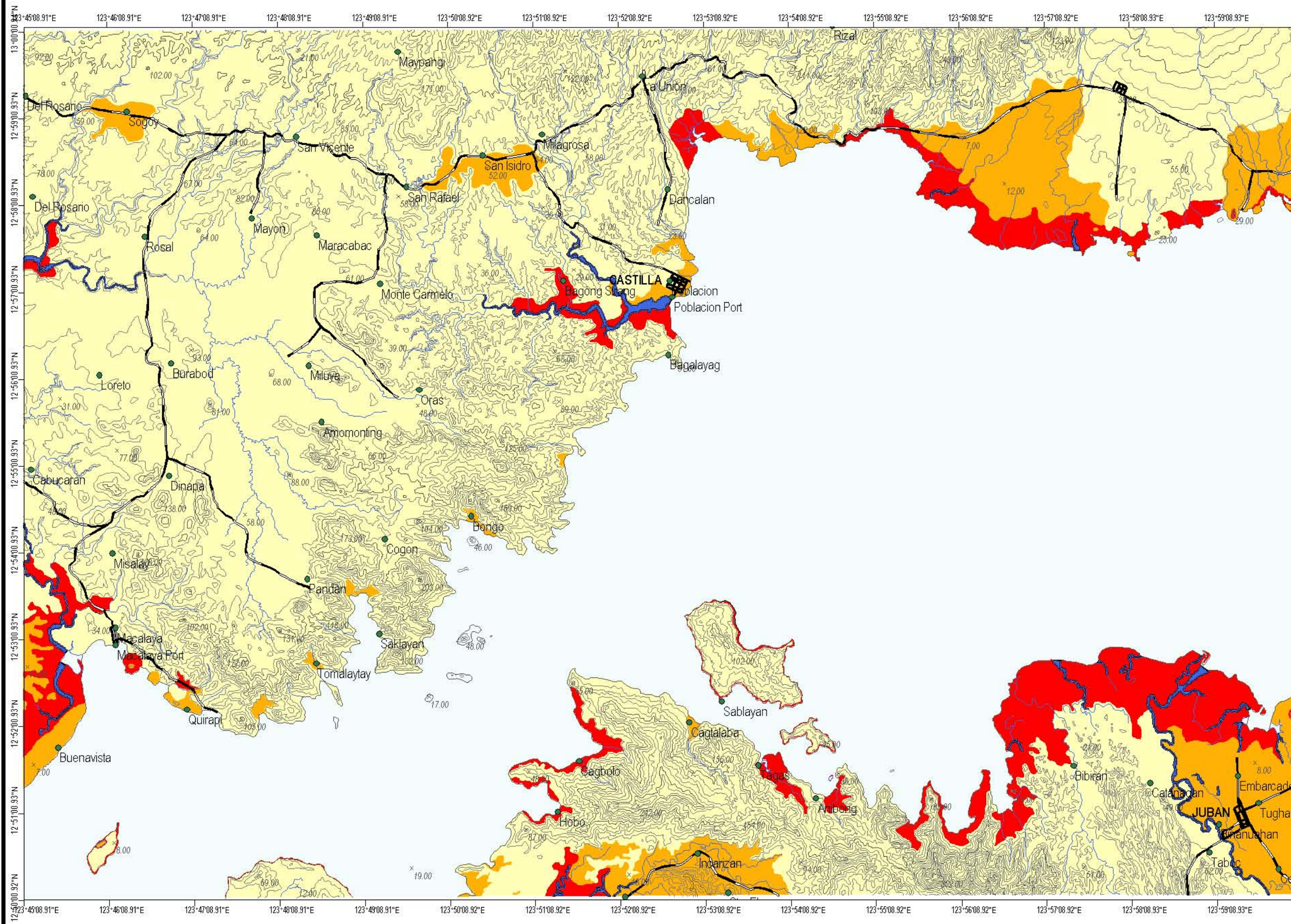
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LIQUEFACTION POTENTIAL MAP OF CASTILLA QUADRANGLE



MAP LEGEND:

Liquefaction Potential Zones:

- Areas where liquefaction is likely
 - Areas where liquefaction is possible
 - Areas where liquefaction is not likely
- contour
 - fault
 - river
 - road

EXPLANATIONS:

There are no reported liquefaction occurrences based on several field interviews. However, zones of different liquefaction potential were derived based on the geomorphological analysis of the study area following methodology by Iwasaki and Yasuda.

Areas where Liquefaction is Likely:
 Areas where liquefaction is likely include riverbeds, old or abandoned riverbeds and meanders, tidal flats and swamps. These areas are not very suitable for housing development. Multi-storey buildings should be required geotechnical studies addressing or mitigating the possible effects of liquefaction.

Areas where Liquefaction is Possible:
 Pyroclastic plains and flood plains where groundwater table is relatively shallow and subsurface soils are silty to sandy are areas where liquefaction is possible. Buildings of 5 storeys or more should be required geotechnical studies to determine and mitigate possible effects of liquefaction.

Areas where Liquefaction is not Likely:
 Areas where the occurrence of liquefaction is unlikely.

Field data collection by: M.R.M. Rint
 Geomorphological Interpretation by: M.R.M. Rint
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 Digital cartographic processing by: M.R.M. Rint & B. Malto
 Checked by: A.E. Dayao
 Approved by: R.A. Juan

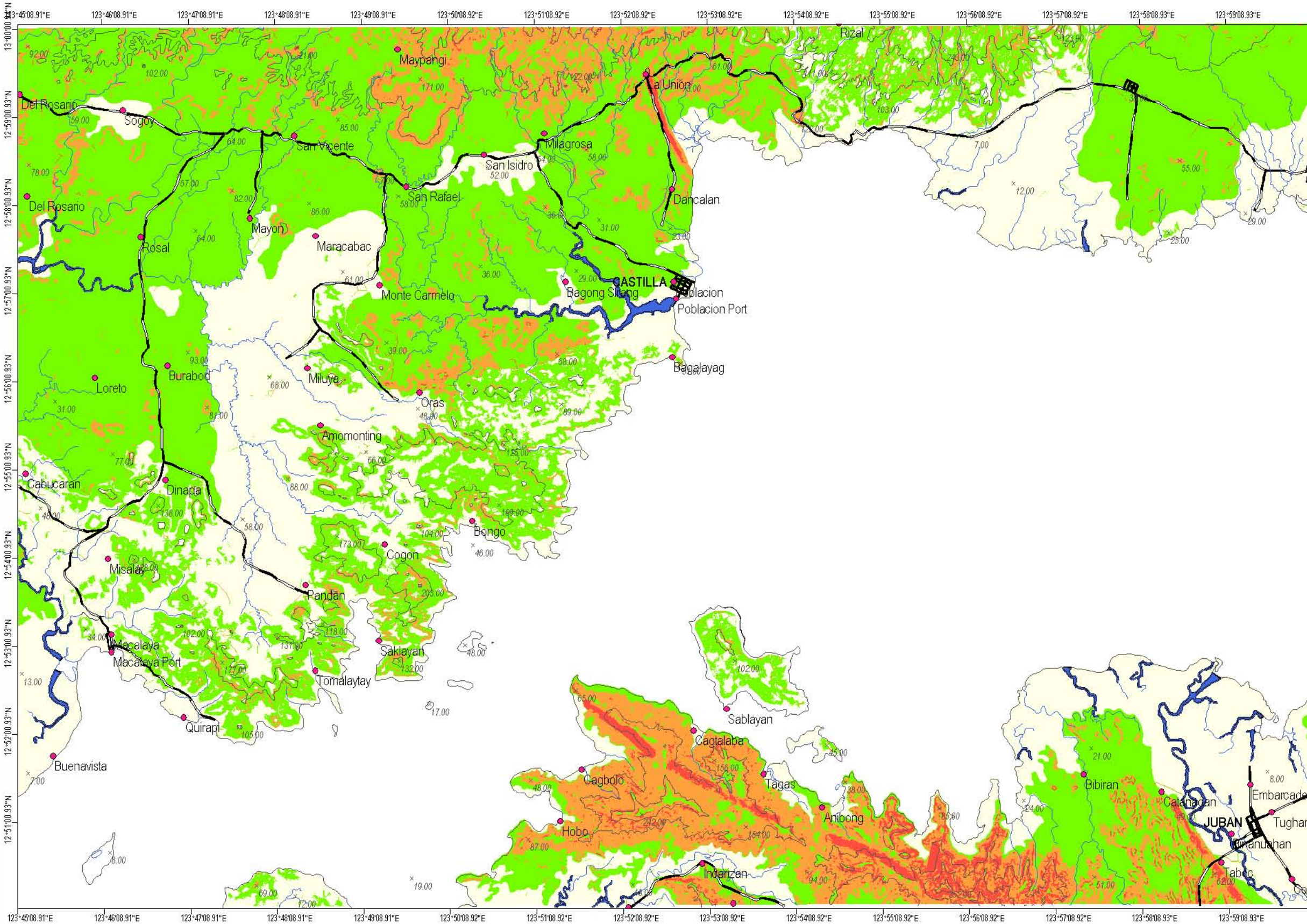
Other Sources of Information:
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 1951 B/W Aerial Photographs scale 1:44,000



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LANDSLIDE HAZARD MAP OF CASTILLA QUADRANGLE



MAP LEGEND:

Landslide Susceptibility Zones:

- Absent
- Low susceptibility to landslides
- Moderately susceptibility to landslides
- High susceptibility to landslides

— contour
 - - - fault
 ~~~~~ river  
 = road

**EXPLANATIONS:**

Landslide hazard susceptibility was derived through qualitative map combination using lithology, geomorphology, slope gradient, fault distance and road distance as parameters. GIS was used in the map combination and subjective weights were assigned to each unit in the parameter map based on field knowledge.

**Areas with High Susceptibility to Landslides:**  
 Areas with equally high probability of occurrence of mass movements particularly rock slides, slumping, debris slides and debris flows. Very steep to extremely steep slopes underlain by weather volcanic pyroclastics are rated high susceptibility areas. Areas under high susceptibility are unsuitable for human settlement.

**Areas with Moderate Susceptibility to Landslides:**  
 Areas having moderate likelihood of occurrence of landslides. Any development in this area should first undergo appropriate evaluation.

**Areas with Absent or Low Susceptibility to Landslides:**  
 Areas where the threat and likelihood of landslide is either absent or low. These areas are suitable for habitation as long as other geologic hazards are rated absent or low.

Field data collection by: M.R.M.Rint  
 GIS processing by: M.R.M.Rint  
 Digital cartographic processing by: Laguerta, E. & Malto, B.  
 Checked by: A.E.Dayao  
 Approved by: R.A. Juan

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# GROUND SETTLEMENT SUSCEPTIBILITY MAP OF CASTILLA QUADRANGLE



## MAP LEGEND: Ground Settlement Susceptibility Zones:

- Areas not susceptible to ground settlement
- Areas susceptible to ground settlement
- contour
- fault
- river
- road

## EXPLANATIONS:

Areas of possible ground settlement were delineated through the analysis of the geomorphological lay of the study area, the sub-surface soils and the ground water levels.

**Areas Susceptible to Ground Settlement:**  
Areas where fluvial and fluvio-deltaic sands, silts and clays coupled with shallow ground water table are sites of possible ground settlement. Ground settlement may be reduced through appropriate foundation design. Buildings having 3 storeys or more should be tested for settlement and/or consolidation. Buildings having 5 storeys and more should undergo detailed geotechnical studies.

**Areas not Susceptible to Ground Settlement:**  
Areas where the possibility of ground settlement is low or absent but still, buildings of 5 storeys or more should undergo geotechnical studies.

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 Geomorphological Interpretation by: M.R.M. Rint  
 GIS processing by: M.R.M. Rint  
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