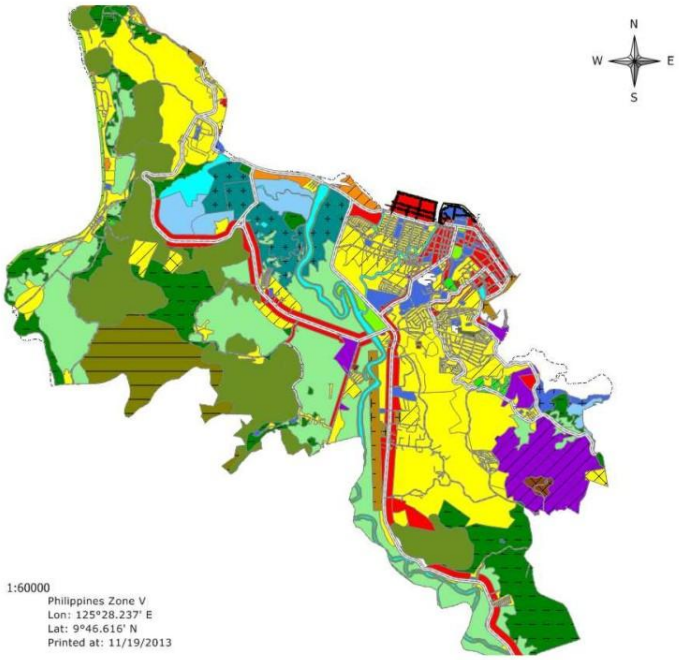
CITY OF SURIGAO

COMPREHENSIVE LAND USE PLAN

(2011-2020)

Volume 3



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Republic of the Philippines
SANGGUNIANG PANLUNGSOD
CITY OF SURIGAO
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EXCERPT FROM THE JOURNAL OF PROCEEDINGS OF THE 8th REGULAR SESSION OF THE SANGGUNIANG PANLUNGSOD OF THE CITY OF SURIGAO HELD ON FEBRUARY 26, 2015, AT THE SESSION HALL.

PRESENT:

Hon. Luceniano E. Lancin,	City Councilor (Presiding)
Hon. Rise Faith R. Recabo,	City Councilor
Hon. Kent L. Yuipco,	City Councilor
Hon. Ernesto U. Matugas, Jr.,	City Councilor
Hon. Leonilo A. Aldonza,	City Councilor
Hon. Perfecto B. Consigo,	City Councilor
Hon. Pablo A. Bonono, Jr.,	City Councilor

ABSENT:

Hon. Danilo C. Menor,	City Vice Mayor (Acting City Mayor)
Hon. Carlos C. Gorgod, Jr.,	City Councilor
Hon. Baltazar C. Abian,	City Councilor
Hon. Fernando S. Almeda III,	City Councilor
Hon. Jose V. Begil, Jr.,	City Councilor

xxx xxx xxx

RESOLUTION NO. 93-2015

WHEREAS, indorsed to the Honorable Council is the request for the adoption and approval of the Surigao City Comprehensive Land Use Pan (CLUP) 2011-2020;

WHEREAS, salient provisions contained in the land use plan were already presented to the Honorable Council in the series of thorough deliberation previously conducted; the plan sets general direction for the City Government of Surigao in the aspect of urbanization and shall serve as the blueprint in the infrastructure settlements in the City;

WHEREAS, the nature of the Surigao City Comprehensive Land Use Pan (CLUP) 2011-2020 is dynamic and shall accommodate consideration for future modification even if adoption and approval of the same pass through the Honorable Council;

WHEREAS, taken into consideration the necessity to finally adopt and approve the aforesaid plan in account for future physical development and zoning enactments in the city without prejudice to future modification, the Honorable Council hereby acted favorably on the matter;

NOW, THEREFORE, on motion of Hon. Perfecto B. Consigo, seconded by Hon. Pablo A. Bonono, Jr., it was unanimously

RESOLVED: To adopt and approve the Surigao City Comprehensive Land Use Plan (CLUP).

RESOLVED FURTHER: That copies of this resolution be furnished the Honorable City Mayor and the City Planning and Development Office, for their information, guidance and appropriate action.

I HEREBY CERTIFY to the correctness of the foregoing resolution.

NENITA G. LOAYON
Sanggunian Secretary

ATTESTED:

LUCENIANO E. LANCIN
City Councilor
Presiding Officer

APPROVED:

ERNESTO T. MATUGAS
City Mayor

DANILO C. MENOR
CITY VICE MAYOR
ACTING CITY MAYOR

City of Surigao
Philippines

CITY DEVELOPMENT COUNCIL

Resolution No. 15-2011

A Resolution Adopting and Favorably Endorsing to the Sangguniang Panlungsod, the Surigao City Comprehensive Land Use Plan 2011-2020, integrating Disaster Risk Reduction and Climate Change Adaptation

Whereas, R.A. 10121 or the Philippine Disaster Risk Reduction and Management Act of 2010 mandates local government units to integrate Disaster Risk Reduction and Climate Change Adaptation (DRR+CCA) in local development plans;

Whereas, the City of Surigao has been selected as one of the pilot local governments in the country to be provided with technical assistance under the auspices of the United Nation's Development Program (UNDP) Ready Project and Australian Aid for International Development (AusAID) in integrating disaster risk reduction and climate change adaptation in the preparation and/or updating of comprehensive land use plans;

Whereas, for a period of about one (1) year beginning December 2010, the city through the planning technical working group went through the DRR+CCA land use updating process in partnership with the National Economic Development Authority, the Housing and Land Use Regulatory Board and other concerned national line agencies;

Whereas, the herein-presented CLUP complied with the prescribed mandates of related issuances and adequately reflected the harmonized and balanced spatial requirements for production areas, protection and conservation areas, settlement zones, and the necessary infrastructure backbone of the city's envisioned socio-economic development;

Whereas, the CLUP for 2011-2020 embodies the development aspirations of the people of Surigao City and it is complementary and supportive of the Provincial Physical Framework Plan, the Regional Physical Framework Plan and the national Medium Term Development Plan;

Now therefore, upon motion of Mr. Mario Gesta, unanimously and duly seconded by the body;

Resolved as it is hereby resolved that the Surigao City Comprehensive Land Use Plan for 2011-2020 is hereby approved and adopted by the City Development Council during its 4th quarter general assembly of 2011.

Resolved further that the CDC hereby indorses for favorable action the herein CLUP 2011-2020 to the Sangguniang Panlungsod for their review and approval.

Let copies of this Resolution be furnished the Office of the Sangguniang Panlungsod through the Presiding Officer and City Vice Mayor Danilo C. Menor for their information and appropriate action.

Done this 6th day of December 2011 at Surigao City, Philippines.

Certified true and correct:

12/6/2011

DIANA C. EDERA
CGADH-I/Acting CPDC
Secretariat, CDC

APPROVED:

ERNESTO T. MATUGAS
City Mayor
Chairperson, CDC

Republic of the Philippines
PROVINCE OF SURIGAO DEL NORTE
Surigao City

PROVINCIAL LAND USE COMMITTEE

PLUC RESOLUTION NO. 04
Series of 2014

"RESOLUTION INDORSING THE COMPREHENSIVE LAND USE PLAN (CLUP) OF SURIGAO CITY, SURIGAO DEL NORTE TO THE SANGGUNIANG PANLALAWIGAN FOR THEIR APPROPRIATE ACTION"

WHEREAS, under the provision of E.O. No. 72, the PLUC shall assists the Sangguniang Panlalawigan in reviewing the Comprehensive Land Use Plans of all cities/municipalities to ensure that it is in accordance with the Provincial Development and Physical Framework Plan (PDPFP) and National Policies, standards and guidelines;

WHEREAS, the City of Surigao has submitted their Comprehensive Land Use Plan for review and approval by the Sangguniang Panlalawigan;

WHEREAS, based on the review and evaluation of the CLUP, the PLUC members have generated various findings and comments for inclusion in their comprehensive land use plan;

NOW THEREFORE, BE IT RESOLVED AS IT IS HEREBY RESOLVED, on motion and duly seconded by the majority, to indorse the CLUP of Surigao City to the Sangguniang Panlalawigan through the SP Chairman Committee on Housing and Land Utilization;

PLUC RESOLUTION NO. 04
Series of 2014

"RESOLUTION INDORSING THE COMPREHENSIVE LAND USE PLAN (CLUP) OF SURIGAO CITY, SURIGAO DEL NORTE TO THE SANGGUNIANG PANLALAWIGAN FOR THEIR APPROPRIATE ACTION"

RESOLVED FURTHER, that copies of this resolution be furnished to the Provincial Vice-Governor Hon. Arturo Carlos A. Egay, Jr., Presiding Officer, Sangguniang Panlalawigan, Hon. Leonila P. Gorgolon, SP Chairman, Committee on Housing and Land Utilization and LGU of Surigao City, Surigao del Norte for their appropriate action.

Approved, June 24, 2014
Philippine Gateway Hotel
Surigao City

Certified Correct:

EVELYN T. CONSON
PLUC Secretariat

APPROVED:

IVONNIE B. DUMADAG
Chairman
Provincial Land Use Committee

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COMPREHENSIVE LAND USE PLAN
City of Surigao
2011-2020

CHAPTER 1
Plan Framework and Rationale

1.1 Framework

The herein Comprehensive Land Use Plan (CLUP) of the City of Surigao reflects and provide the translation in the local level of the National Physical Framework Plan (NPFP) under the Aquino Administration. As such it contains the specific local level directions, strategies and policies for the judicious utilization of land, giving the detailed translation of the general directions provided for in the NPFP, the Caraga Region Physical Framework Plan (RPFP) and the Surigao del Norte Provincial Physical Framework Plan (PPFP).

As such, the present national administration's social contract with the Filipino people provides the overall bases for the plan's detailed translation into specific strategies and policies in the local level and also incorporating the Caraga regional development vision of a *globally competitive economy anchored on sustainable development.*

Also providing the additional inputs in the finalization of this plan are the past and present sectoral development plans, the Surigao City Development Plan, the Caraga Regional Development Plan (CRDP) and other related documents. Such referral was made for the purpose of contextualizing the city's land use development in congruence with its spatial development role on a much larger scale.

The City of Surigao is the alternate growth and service center in Caraga Region, especially in the northeastern area facing the Pacific Rim. The Caraga RPFP specifies a hierarchy of functional roles and it identified the city as a Special Zone for Mineral-Based Industries and as the alternate commercial and trading center in the region. This is the spatial development role that serves the basis that the city plays in the overall development scenario of the region. Further, the RPFP specifies a strategy of growth centers and satellite approach with the city serving the future urban metropolis along its influence area in the northeastern part of the region.

In the provincial level, being the provincial capital of Surigao del Norte, the city plays the primary role of being the center for commerce and trade, education, financial services and other related urban development support services. On top of its urban development role, it serves as the center for industrial development, especially mineral processing and other allied industries, by virtue of existing industries and a special economic zone. It is the primary entry and exit point for all transportation networks providing both intra- and inter-provincial linkages. Surigao City plays a critical role in the achievement of the provincial level preferred development strategy which combines mineral resource development, agri-fishery development and eco-tourism development under the PPFP's Strategic Area Resource Development.

The broad framework which provides the general direction of the priorities set forth in this CLUP are aligned with the development priorities of the hierarchy of socio-economic and physical development plans from the national, regional and provincial levels.

1.2 Rationale

The existing CLUP and its implementing Zoning Ordinance dates back to the year 2000 and is the successor of an earlier crafted town development plan and zoning dating back to the 1980's. Given the supposed expiration of the plan coverage in 2004, the need for the updating of the subject CLUP has become more apparent. The more than a decade that has elapsed in the plan's coverage period makes it necessary to revisit and evaluate its directions and priorities, which is further heightened with the entry of a new national administration in 2010, the new set of officials in the local level, the recent completion and planned entry of major projects in the city affecting urbanization trends, and the new policy issuances that affect the usual physical planning and land use dimensions.

The convergence of all these factors, especially the integration of disaster risk reduction and climate change adaptation (DRR-CCA) into local development plans doubly pressed the need to update the CLUP. The CLUP has to be updated so that strategies and policies have to be set in place in order to translate in the local level the responsive actions that would truly address the aforementioned factors, and come up with specific measures that would balance judicious land utilization and the concerns of DRR-CCA, particularly on the aspect of prevention and mitigation.

Moreover, the presence of new and upcoming big ticket investments would eventually put strain and accelerate present urbanization trends, increase demand for infrastructure and related urban services, thus, a rethinking of the presently preferred spatial development strategy shall be conducted as an integral component of the CLUP updating process.

Thus, the importance of updating the Surigao City CLUP borders on more than the need to fulfill existing mandates but rather to enhance the city's capability to be responsive and proactive, come up with up-to-date policies and strategies for protection and conservation measures, production support, settlements expansion and urbanization, as well as the planning for better circulation and other infrastructure requirements. Addressing these factors has to be done in a critical manner of striking a balanced and sustainable development, and at the same time integrating the intricacies to allow better capabilities in DRR-CCA, particularly the prevention, mitigation and response mechanisms.

CHAPTER 2
Physical Development Challenges

2.1 Inherent Constraints

The City of Surigao is susceptible to both hydro-meteorological and geologic hazards based on secondary data and technical findings of concerned national line agencies like PAGASA, DENR-MGB, PHIVOLCS and others. These are mainly the inherent constraints and the technical discussions and data sources contained herein were culled out from the comprehensive geo-hazard survey covering the city's 54 barangays conducted by the DENR-MGB 13 in 2004. Past disaster reports from various agencies also formed part of the sources of information that facilitated the formulation of the city's hazard profile.

2.1.1 Hydro-meteorological hazards

Flooding

Flooding is the most common and perennially occurring hazard in the mainland of Surigao City. This usually occurs along the river flood plains and coastal areas of the city affecting no less than all of the city's five (5) urban barangays, 12 coastal barangays in the suburban and rural districts southeast and northwest of the urban area, and 10 barangays along the Surigao River and one (1) barangay adjacent to the Anao-aon River.

The common occurrence of flooding in Surigao is either river flooding or coastal flooding. For river flooding, the main source is the Surigao River and its tributaries Kinabutan and Tumanday Rivers and several other unnamed creeks and channels. In most cases, river flooding occurs with several factors coming into play. The most common contributors are the volume and magnitude of rainfall, the current morphology of the river, diminished or constricted catchment areas, and obstruction of the river flow. Similarly, coastal flooding also takes on the following parameters; the structure and form of the coastal areas, inclement weather conditions including storms and typhoons, tide levels, and the presence or absence of mangroves or coastal vegetation.

The causes are usually related to the balance of the inflow and outflow of surface waters. What usually transpired in the city is that this balance remains at tolerable levels during normal weather conditions in spite of high tide levels usually blocking off drainage outfall areas. But during heavy downpour, the surface run off waters would dump large volumes into the river channels causing swelling and inundation of the nearby flood plains affecting farm lands, settlements and infrastructure. The large amount of rainfall usually is the main trigger that affects the volatile balance of surface water inflow and outflow, together with such compounding factors like the tide level, condition of the river channels and drainage canals, unregulated alteration of ground line and grade affecting the capacity of natural basins, and the interplay of conditions in the city's upland ecosystems like the loss or deteriorating condition of forest vegetation.

The diminishing forest vegetation does not only affect the soil absorption capacity to retain rainwater but it will also contribute to the more rapid travel of surface run-off and siltation of river beds. This will put further strain in the river system's capacity to absorb large volume of water thus resulting to more frequent swelling and overflowing.

The frequency of flood occurrence in the city averaged around one (1) to three (3) events per year. A higher frequency of as much as five (5) events per year may occur along the identified flood critical areas. Flood elevation ranges from a low of about 0.5 meters along urban streets to a high of 3.2 meters in areas along the river flood plains. The most recent and worst flooding that lasted for two (2) days in some areas was in mid-December 2003. The rainfall measuring 566.4 mm recorded in December 18, 2003 (PAGASA) topped the 100 year record for the city and resulting to flood levels of as high as more than three (3) meters.

From the list of about 28 mainland barangays identified as flood prone areas, the table below further details the specific conditions in each barangay.

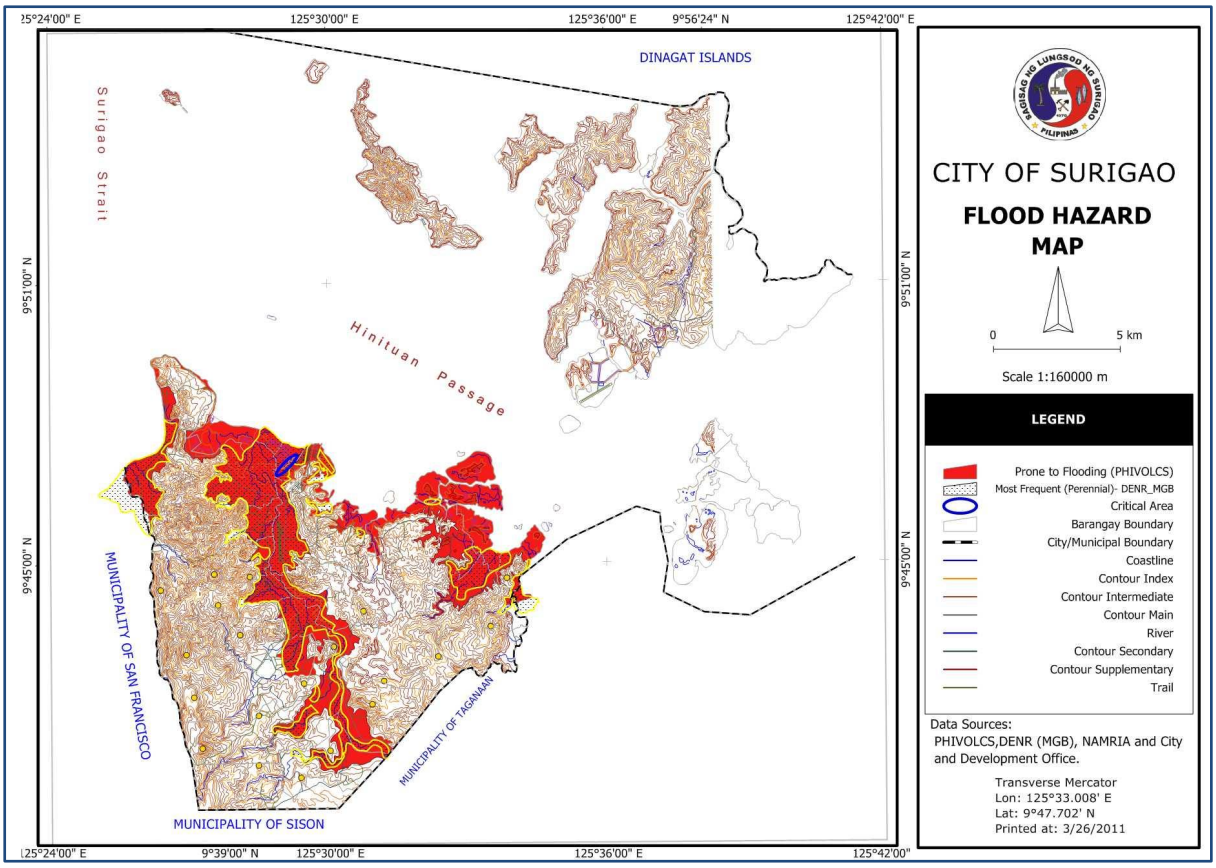
CRITICAL FLOOD PRONE AREAS
Surigao City
2004

Name of Barangay/ Sitio/Purok	Description of Geohazard	Recommendations
1. Bonifacio : Purok 2	Flooding – from overflow of the Surigao River, aggravated from impounding of creek tributary due to small culvert drainage.	1. Redesign, reconstruct culvert across the highway 2. Formulate evacuation plan for 31 houses every time there is continuous heavy rain.
2. Bonifacio : Purok 7	Flooding – from overflow of the Surigao River, affecting whole of Purok 7	Formulation of an Integrated Surigao City Flood Mitigation Program
3. Cabongbongan : Purok 2 and 3	Flood and riverbank scouring – due to very close distance of settlement from the Cabongbongan river bank; at least four houses were critically affected.	1. Relocation of 4 houses along riverbank. 2. Impose easement regulation along river bank 3. Study and formulation of Flood Mitigation Program.
4. Cagniog : Purok 4, 5, 6	Flooding – due to obstruction / damming of Culvert.	1. Reconstruction / redesign of culverts. 2. Construction / improvement of drainage canals.
5. Capalayan : Purok 1, 2, 3, 4, 5, 6, and 8	Flood hazard – Almost all settlements and ricefields were flooded last December 2003	1. Study and formulation of Flood Mitigation Program. 2. Impose easement regulation along river bank
6. Danao : Purok 1, 2 & 3	Flood hazard – due to the Suyok and Bongbong Creeks	Immediate provision of mitigating measures, such as::

Name of Barangay/ Sitio/Purok	Description of Geohazard	Recommendations
	which have denuded watershed w/ numerous landslide- and erosion-prone portions causing heavy siltation of creek channels & spillway.	1. De-siltation of creek Channels. 2. Revise spillway design. 3. Imposition of easement regulation of 40 meters from the riverbank 4. Relocation of houses from the easement zone. 5. Reforestation of the watershed. 6. Construction of river dike along easement zone
7. Luna : All Purok along Surigao River	Flood hazard – due to location on the natural active floodplain of the Surigao River.	Formulation of an Integrated Surigao River Flood Mitigation Program
8. Mabini : Sitio Togonan Purok 5	Flood hazard – from inundation of Caningag River affecting approximately 15 houses	1. Construction of riprap or gabion type river dike along the outer bend of the river. 2. Damaged spillway must be removed completely to ease the flow of water to avoid back flow effects.
9. Mabua : Purok 1,2,3,4	Flashflood hazard – from Mabua creek, aggravated by poor design of the culvert drainage. One house partially damaged at Purok 1 last Dec 19, 2003	1. Redesign culvert. 2. Construct floodwall in the downstream portion of the culvert. 3. Relocation of the affected house.
10. Sabang : Whole Barangay	Coastal and River Flooding – due its location at the delta of Sabang River	Formulation of an Integrated Surigao River Flood Mitigation Program
11. San Juan : Purok 6	Flood hazard and riverbank scouring – due to close proximity to the Kinabutan River, less than 50 meters. 10 houses were destroyed during December flood, 47 – 50 houses were affected.	1. Formulation of an Integrated Surigao River Flood Mitigation Program 2. Relocation of houses critically affected by bank scouring.
12. San Roque : Purok 4	Flood hazard - from the overflow of the Surigao River reaching houses 50 meters from the riverbank.	Formulation of Integrated Surigao City Flood Mitigation Program
13. San Roque	Flood hazard - from overflow of the Surigao River; highly risky to 7 houses in Area 1; and 17 houses in Area 2 due to flood waters reaching 200 meters	Formulation of an Integrated Surigao City Flood Mitigation Program

Name of Barangay/ Sitio/Purok	Description of Geohazard	Recommendations
	from the banks	
14. Togbongon : Sitio Songkoy Purok 7 & 1	Flashflood – critical due to proximity to main creek and bounded by steep slopes on other side.	Relocation of houses.
15. Togbongon : Sitio Ulawan Purok 6	Flashflood – due to location at edge of alluvial plain and base of slope.	Relocation of 5 houses.
16. Washington : Kaskag(Riverside), Bagong Silang Purok 2	Flood hazard – seasonally flooded from Surigao River due to location in the natural floodplain in the eastern part of Surigao River delta. Flood height ranged from 2.0 – 3.2 meters in Bagong Silang (river side).	Formulation of an Integrated Surigao River Flood Mitigation Program

Source: Geo-Hazard Survey, DENR-MGB 13, 2004



Landslides

The geologic setting and weather conditions of the city make it susceptible to both earthquake-related and rain-induced landslides in some areas.

Landslides, as defined refers to the downward and outward movement of slope forming materials composed of natural rock, soil, artificial fills or combination thereof. Landslides move along surfaces of separation by falling, sliding and by flowing. A landslide may start as a rock slide but at the time a flowing type of movement started, the materials may be an unconsolidated mass of extremely rapidly moving debris as rapid as 100 kph (Geo-Hazard Survey, DENR-MGB 13, 2004).

The material of the landslide may be predominantly soil such as in earth slump and earthflow or predominantly rock such as in rock slide and rock fall, or a combination of soil and rock such as in debris slide, debris slump and debris flow. All these types of landslides occurred in Surigao City (Geo-Hazard Survey, DENR-MGB 13, 2004).

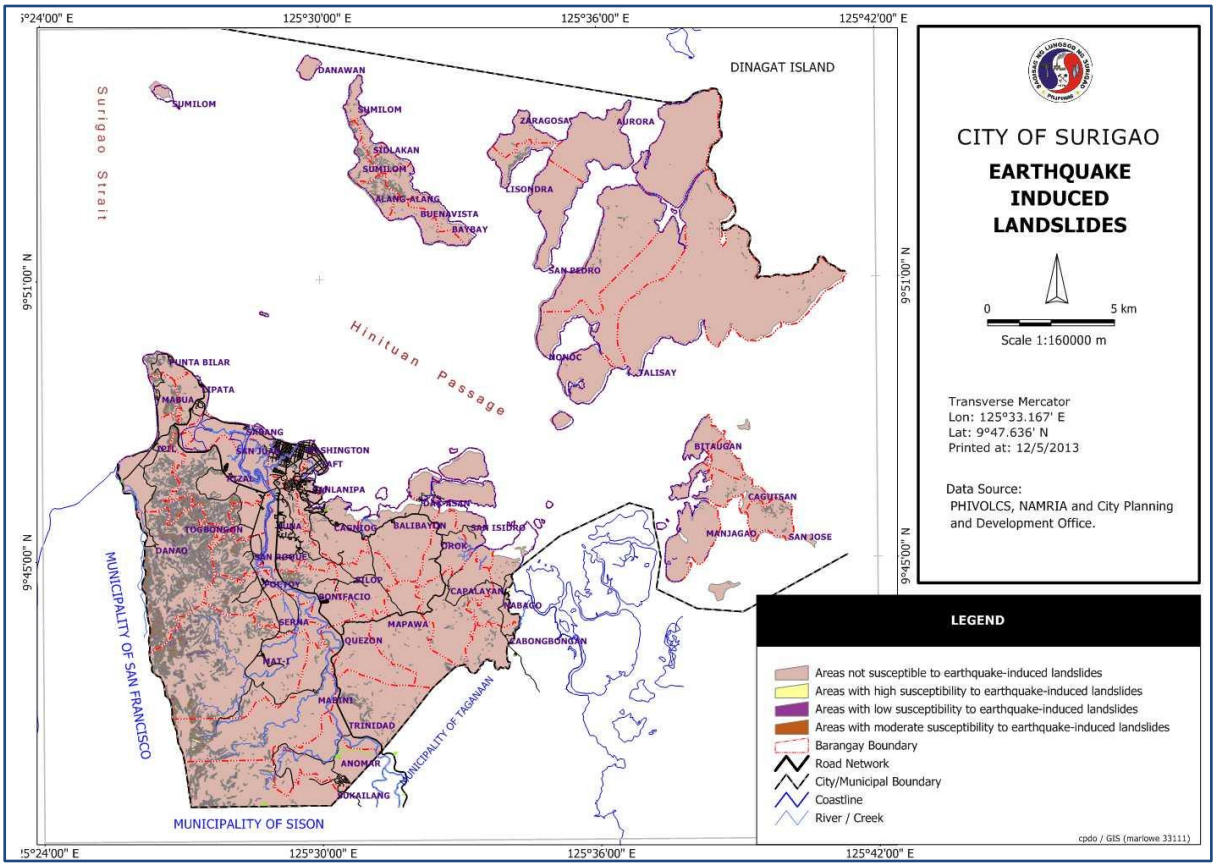
PHIVOLCS also showed in their hazard map a major fault line which is a part of the Philippine Fault Zone cutting across the Province of Surigao del Norte affecting certain portions of the city, specifically, along its western boundary. The movement of this fault line may also trigger landslides.

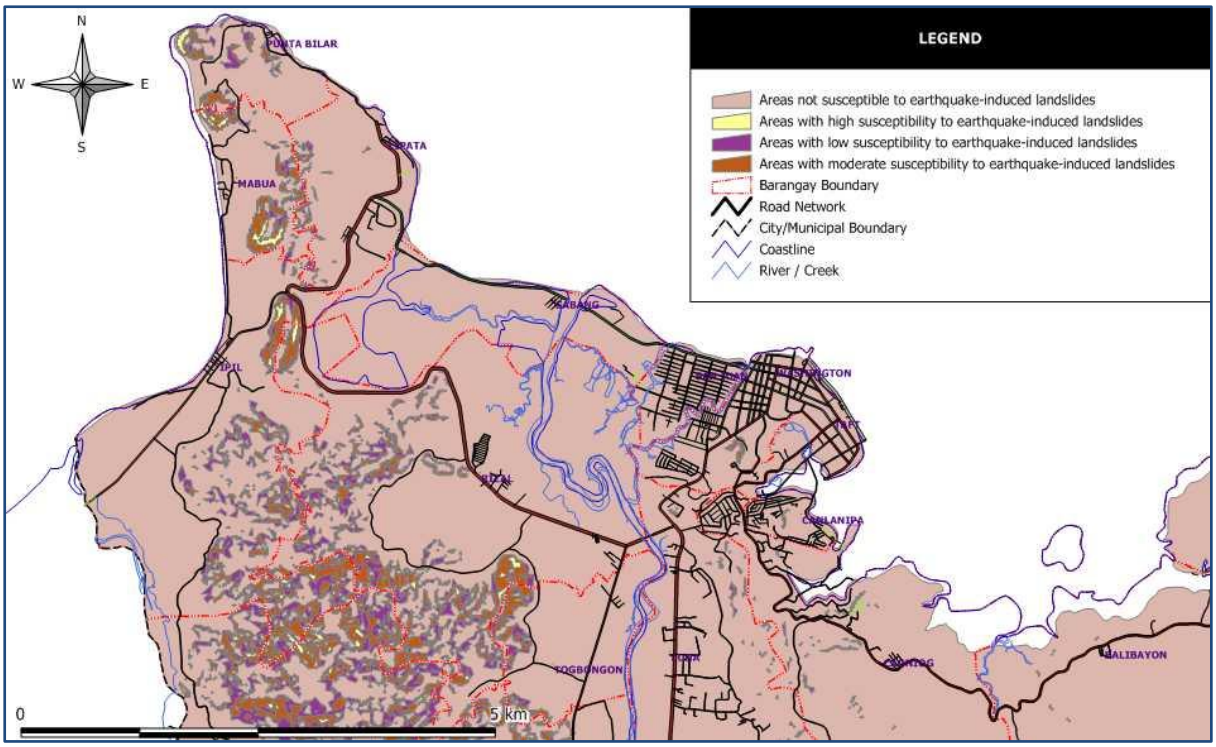
Per technical geologic report of the DENR-MGB, there are several factors that trigger landslides. The following, either as a single factor or a combination of several, are considered the most common triggers, viz:

1. Inherent weakening, shearing strength of the materials composing the slopes;
2. Deep weathering, producing weak bedrock and thick topsoil layers;
3. Steep slopes;
4. Presence of water seepages, rills and gullies (either natural or caused by human action);
5. Sparse vegetation;
6. Presence of undercutting; and
7. Slope alteration due to unregulated development, poor site selection, and/or incompatible land use(s).

Most of the landslides that occurred in the city happened along steep to extremely steep slopes of from 30% (17°) to more than 85% (40°). However, there are occurrences also in areas with only gentle to moderate slopes of from 18% (10°) to 30%. The aggravating factors usually are the thickness of the topsoil layer and the presence of gullies and water seepages.

The geo-hazard map (DENR-MGB, 2007), has identified several sloping areas of 39 barangays to be prone to earthquake-induced landslides and 29 barangays to rain-induced landslides, with varying degrees of susceptibility.





Areas within the city mainland that is susceptible to earthquake induced landslides.

BARANGAYS SUSCEPTIBLE TO LANDSLIDES
Surigao City
2007

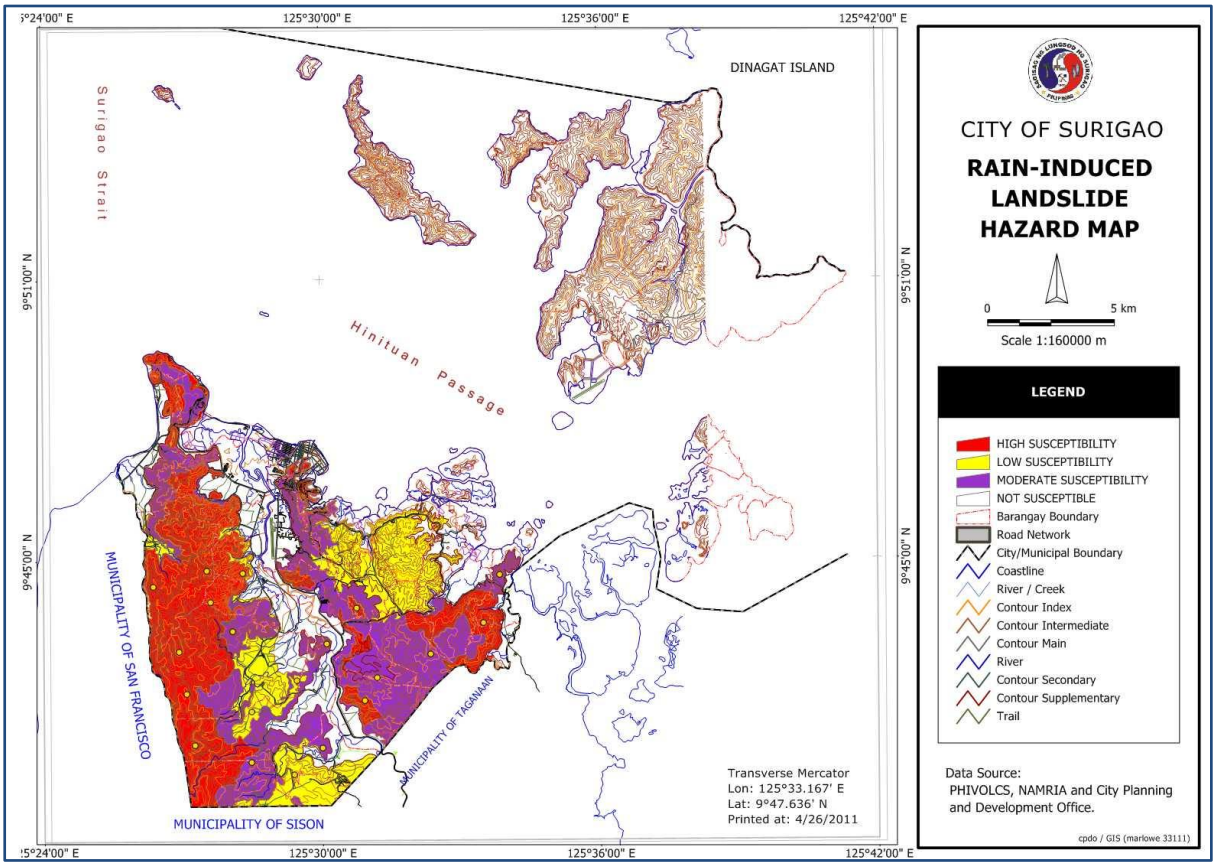
EARTHQUAKE-INDUCED				RAIN-INDUCED			
Low	**Low to Moderate**	**Moderate to High**	**Low to High**	**Low**	**Low to Moderate**	**Moderate to High**	**Low to High**
Anomar	Alang-Alang	Trinidad	Bonifacio	Balibayon	Anomar	Bonifacio	Capalayan
Baybay	Alegria	Washington	Danao	Orok	Cagniog	Cabong-bongan	Danao
Buenavista	Bilabid		Ipil		Luna	Canlanipa	Mabini
Cagutsan	Cabong-bongan		Libuac			Ipil	Mabua
Cantiasay	Cagniog		Mabini			Lipata	Mapawa
Lipata	Canlanipa		Mabua			Nabago	Mat-i
Lisondra	Capalayan		Mat-i			Punta Bilar	Poctoy
Luna	Catadman		Poctoy			Quezon	San Roque
Nabago	Mapawa		Punta Bilar			Rizal	Serna
Sidlakan			Quezon			Taft	Silop
Silop			Rizal			Trinidad	Sukailang
Talisay			San Jose			Washing-ton	Togbongon
			San Roque				
			Serna				
			Sukailang				
			Togbongon				

Source: Geo-Hazard Map, DENR-MGB, 2007

In the 2004 geo-hazard survey conducted by the DENR-MGB 13, a more thorough and more specific identification of landslide-prone areas were identified. The results of the survey showed that there are 47 areas in 28 barangays that are considered in critical condition.

Landslides were found to have occurred in all types of material composing the slopes. Landslide occurred in andesite bedrock in Brgys Danao, Ipil, Lipata, Mabua, Rizal, Togbongon, San Roque, Poctoy, Mat-I, Bonifacio, Luna, Trinidad and Cabongbongan; and in Ultramafic rocks in Brgys Punta Bilar, Lipata, Mat-I, San Jose, Nonoc, Cantiasay, Talisay, Cagutsan, Bitaugan and Manjagao. In other barangays landslides occurred in Sedimentary Rocks such as conglomerate, sandstones and limestone, and in Terrace gravel bedrock, such as, in Brgys Washington, Luna, Taft. Canlanipa, Cagniog and Capalayan. Furthermore, landslides occurred in artificial filling materials of road pavements in Mapawa, Cagniog, Silop, Bonifacio and in the SMWD reservoir (Geo-Hazard Report, DENR-MGB 13, 2004).

The most recent and worst rain-induced landslide happened in mid-December 2003, in Sitio Kinabutan, Brgy. Rizal, destroying eight (8) houses and killing 12 persons. Rock and soil flowed downslope with such velocity destroying even concrete houses along its path with debris reaching up to 150 meters from the base of the slope.



CRITICAL LANDSLIDE-PRONE AREAS
Surigao City
2004

Name of Barangay/ Sitio/Purok	Description of Geohazard	Recommendations
1. Bonifacio: Along Road to Silop	Earth slump - incipient landslide coupled with scouring of road pavement	1. Put road sign indicating damaged road. 2. Repair of road 3. Consider rerouting.
2. Bonifacio: Purok 1A, Km 6	Debris slide – in recurrent landslide area of weathered andesite rocks with very steep slopes planted to coconuts. Roadside has only 2 meters buffer zone	1. Remove old landslide materials. 2. Put road sign warning commuters of hazard 3. Consider rerouting of Hi-way 4. Redesign slope protection 5. Relocate houses near landslide.
3. Cagniog : Purok 8	Debris slump – due to high angled slopes left by former quarry in weathered terrace gravel rock formation. High risk to houses only 5 meters from the slope. 4 houses destroyed in landslide.	Relocate all existing houses at the foot slope
4. Canlanipa : Purok Tower	Potential Landslide – indicated by soil creep in Terrace gravel formation; only 1-2 meters from existing houses	1. Immediate evacuation of the 2 houses and the settlement of Purok 2 during continuous heavy rainfall. 2. Medium-term goal – relocation of houses and Purok 2 to safer grounds.
5. Canlanipa : Sitio Housing	Debris slump – in very steep slopes with recent landslide affecting existing houses.	1. Immediate evacuation of residents during continuous heavy rainfall. 2. Medium-term goal – relocation of houses to safer grounds
6. Capalayan : Purok 8	Earth slump – recent occurrence of this type of landslide has damaged barangay roads	1. Immediate rehabilitation of the damaged road portions. 2. Study rerouting of some road portions. 3. Put early warning device as pre-cautionary measure to the commuters.

Name of Barangay/ Sitio/Purok	Description of Geohazard	Recommendations
7. Capalayan : Sitio Mananod, Purok 2	Debris flow/avalanche – due to very steep slopes in weathered sedimentary rocks planted to coconuts. Approximately 60 meters from the road; 4 houses were destroyed; 2 casualties during Dec 18, 2004 rains.	1. Area to the east of the landslide must be off-limit to houses. 2. Other houses nearby must be vigilant and ready to evacuate during continuous heavy rains.
8. Danao : Purok 1	Debris/earth slide - in weathered rocks with very steep slopes (30 degrees), with one meter soil layer; drained by Bongbong creek. Risky to settlement 20 meters away.	Evacuation of local residents every time there is continuous heavy rain.
9. Danao : Purok 3	Debris slide – very steep slopes (70º), 50m relief from creek, 1m topsoil over weathered volcanic rocks; cocoland.	Temporary settlement should be encouraged to relocate
10. Ipil : Purok Alang-alang	Rockslide – highly critical to nearby houses directly at the bottom of the hill with steep slopes and bedded sedimentary rocks	Relocation of the houses
11. Ipil : Sitio Palhi	Debris slump, mudflow, complex landslide - Aggravated by the presence of Pacemco quarry at the ridge top about 200m above the houses	Mitigation measures for the unstable grounds necessary.
12. Ipil : Sitio Kahoy (Ipil-Lipata road junction)	Debris/rock slide – due to recurrent landslide in fractured and weathered andesite rocks with very steep slopes (60 to 70 degrees angle)	1. Immediate stabilization of the slope to protect the roadway and the commuters such as slope benching. 2. Study rerouting of roadway
13. Lipata: Purok 5	Debris slump - in highly weathered rocks with 30º to vertical slopes	Immediate evacuation of local settlement in the vicinity
14. Lipata: Purok 5	Debris slide - in loose ground, very steep slopes. 2 houses destroyed by landslide on Dec. 17, 2004	Settlement should be relocated
15. Lipata: Purok 1	Debris slide – recurrent slides in very steep, weak slopes, 5-10meters away from the school.	1. Rehabilitate slope to increase stability. 2. Closely monitor the slope. 3. Relocate water reservoir.

Name of Barangay/ Sitio/Purok	Description of Geohazard	Recommendations
16. Lipata: Purok 1	Rock slide, rock falls - in an area of recurrent slides, about 5- 7meters from houses.	Relocation recommended
17. Luna : Sitio Bacud	Debris slide – due to very steep slopes in weathered andesite rocks. One house is only 5 to 10 meters away.	Relocation of subject house
18. Luna : Sitio San Vicente Purok 5 (behind ice plant)	Debris slide – due to very steep slopes in weathered andesite rocks. Houses are only 40 to 60 meters away. Ice plant partly damaged during Dec 18, 2004 heavy rainfall.	1. Close monitoring of slope (i.e. extensometer) 2. Evacuation of residents during continuous heavy rainfall. 3. Short-term goal – Relocation of the nearby houses to safer grounds.
19. Luna : Bernadette	Debris slump – in highly weathered terrace gravel with very steep slopes, high risk to 2 houses about 25 meters from the footslope.	1. Evacuation of 2 houses during continuous heavy rainfall. 2. Medium-term goal – relocation of the 2 houses to safer grounds.
20. Luna: Shrine	Debris slump – in highly weathered terrace gravel with very steep slopes, high risk to 2 houses about 50 -100 meters from the footslope, 1 nipa hut destroyed in December 2003.	1. Evacuation of 2 houses during continuous heavy rainfall 2. Medium-term goal – relocation of the 2 houses to safer grounds.
21. Luna : Upper Looc	Debris slump – in weathered sedimentary rock with steep slopes; only 2 meters from settlement	1. Evacuation of houses during continuous heavy rainfall. 2. Medium-term goal – relocation of the houses to safer grounds.
22. Mabua: Purok 6	Debris slump - occurred recently in weathered rocks with slopes converted to agricultural use	Two (2) households downslope must watch out for landslide whenever there is continuous rain.
23. Mapawa : Purok 5	Debris slide – due to very steep slopes in weathered andesite rocks. Settlement is only 5 meters away.	Relocation of 1 house
24. Mat-I : Sitio Bambaran, Pinaypayan Purok 13	Debris/earth slump – due to weathered ultramafic rocks with recurrent landslides and very steep slopes (70 – 80 degrees). Highly risky to 11 houses.	1. Monitor tension cracks. 2. Evacuation of houses every time there is continuous heavy rain.

Name of Barangay/ Sitio/Purok	Description of Geohazard	Recommendations
25. Nabago: Purok 2	Debris slump – potential Landslide in weathered sedimentary rocks with very steep slopes in agricultural land use	Immediate installation of extensometer for monitoring purposes.
26. Orok: Purok 3	Potential landslide – indicated by soil creep in highly weathered rocks, with very steep slope angle, endangering at least 4 houses at the base of slope	1. Residents must be vigilant and ready to evacuate during continuous heavy rains 2. Consider future relocation to safer place
27. Punta Bilar: Sitio Looc Purok 4	Rockslide – in very steep (40 deg) andesite rocks. High risk to 4 houses about 10 to 20 meters from toe of slide.	Evacuation of households every time there is continuous heavy rain.
28. Punta Bilar: Sitio Bombels Purok 1	Debris slide – in fractured rocks with very steep slopes, w/ landslide scarp about 15m by 30m	Immediate evacuation everytime there is continuous heavy rainfall.
29. Quezon: (Behind NFA)	Debris slide – in highly weathered sedimentary rocks with very steep slopes. Highly risky to settlement only 15 meters away.	Slope rehabilitation which may be done by: a. slope benching, or b. riprapping
30. Rizal : Sitio Balibayon and Kinabutan 2	Debris slump – recent landslide area, with very steep slopes, highly weathered rocks; cocoland; with the barangay at the base of slope.	1. Immediate relocation of residential houses from four sites including the disaster site of Dec 19, 2003. 2. Sufficient buffer zone from the base of slopes must be imposed (say 300 meters).
31. Rizal : Sitio Lumaban	Debris slump – very steep slopes in fractured rocks traversed by a creek; cocoland with thick (3m) topsoil layer.	Relocation of 3 houses and chapel which are highly at risk at the base of slope.
32. Rizal : Purok Tumanday, Purok 1	Debris slump – found in fractured and weathered andesite rocks with 0.5 meters thick soil and very steep slope angle (30º). One (1) household is highly at risk	Relocation of the house.
33. Rizal : Sitio Kinabutan	Debris slump – in fractured and weathered andesite rocks, with 1 – 3 meters thick soil layer and very steep slopes (30 – 35 degrees). Highly risky to 1 house, located 15 meters from toe of landslide.	Relocation of house owned by Porferia Tero (8 persons)

Name of Barangay/ Sitio/Purok	Description of Geohazard	Recommendations
34. San Roque : Purok 4	Rock fall – in very steep limestone slopes planted to coconuts. About 10 to 20 meters from settlement area. Could be triggered by an earthquake	Impose sufficient buffer zone
35. San Roque : Purok 1	Debris slide – in weathered Andesite rocks with very steep slopes (58%) with one meter thick soil layer. Settlement is only 20 meters away. Last Dec 19, 2003, 8 houses were destroyed with 1 fatality	Immediate relocation of houses remaining on site.
36. Taft : Purok Calipayan	Debris slump – in weathered terrace gravel with steep slopes; high risk to several houses	1. Evacuation of 15 houses during continuous heavy rainfall. 2. Medium-term goal – relocation of the houses to safer grounds.
37. Togbongon : Sitio Songkoy	Debris slump and flashflood – recent slide area; cocoland with very steep slopes and weathered rocks; with limited valley width.	Relocation of settlement.
38. Togbongon :" Sitio Ulawan	Debris slump – recent slide area; undercut by Ulawan creek; with very steep slopes	Relocation during heavy rains.
39. Trinidad: Km 14	Debris slide, Incipient landslides - uphill from the PACEMCO quarry. Situation is highly risky to houses along the National Highway.	1. Relocation of the houses along the highway at the base of slope. 2. Provision of engineering measures 3. Institute evacuation procedures for houses that will remain on site.
40. Washington: Purok Pagasa / Candaba Complex (beside Caraga Hospital and along RizalStreet)	Debris slide – in weathered Terrace gravel rock formation with very steep to vertical cliff; extremely risky to all houses and business establishments located on the slopes and at the base of slope of the hill.	1. Relocation of all houses in entire Purok Pagasa. 2. Implement engineering measures to prevent landslides. 3. Impose sufficient buffer zone at the base of slope. 4. No houses / business establishment be cons-tructed along the roadside 5. Conversion of area into forest park or tourist spot.

Name of Barangay/ Sitio/Purok	Description of Geohazard	Recommendations
41. Baybay: Sitio Panumbayon	Earthslide – in moderately fractured sedimentary rocks; highly risky to houses, 10 to 15 meters away	1. Residents should be prepared to evacuate during continuous heavy rainfall. 2. Medium term – relocation of the houses
42. Bitaugan : Purok 2 and 3	Landslide – highly potential due to weathered Ultramafic rocks with thick soil cover (2-3 m) and very steep slopes (58-119%) and high relief. Highly risky to purok settlement in a narrow coastal plain at the footslope.	1. Residents should be prepared to evacuate during continuous heavy rainfall. 2. Medium term – relocation of the houses possibly to Purok 1 or reclamation area east of Purok 1.
43. Cagutsan : Purok 3	Debris slump – in Ultramafic rocks with 0.5 to 1.0m topsoil, critical to houses at the base of the hill.	1. Residents should be prepared to evacuate during continuous heavy rainfall. 2. Medium term – relocation of houses
44. Libuac : Purok 3 & 4	Landslide – Potential hazard in very steep mountain slopes with sandstone bedrock; School building is 1 meter from the footslope and the water reservoir only 15m away	Formulate evacuation preparedness plan for the evacuation of school occupants in times of continuous heavy rainfall.
45. Manjagao : Purok 4	Debris slump – in highly weathered ultramafic rocks with 1-3 meters topsoil and very steep slopes 50 meters high; very risky to houses at the base of slope, confined in a narrow coastal plain	1. Reforestation on the upper slopes. 2. Provision of drainage canal to control surface run-off 3. Residents should be prepared to evacuate during continuous heavy rainfall. 4. Consider long term relocation of the houses
46. San Jose : Purok 4	Landslide – in highly weathered ultramafics rocks with 2m topsoil, steep gradient (47- 58%), with high school building constructed at the upper slopes	1. Slope stabilization, such as benching. 2. Slope vegetation. 3. Consider relocation of the houses at the base of slope.
47. Talisay : East of Mining 5 area	Earthflow – in intensely weathered ultramafic rocks with thick soil cover (2-5 meters), cut by a gully from 0–100 meters high on the slopes. 1 house was buried at the small coastal plain at the base of slope on Dec 19, 2003, causing 2 casualties.	1. No houses should be allowed to reconstruct at the site. 2. Any house existing at the site should be relocated to a safer place.

Source of Information: Geo-Hazard Survey, DENR-MGB 13, 2004

Storm/Coastal Surges

Storm surges occur as the surge of sea water levels or waves as a result of extremely high winds usually associated with tropical cyclones. High winds push sea water rapidly, building it up into huge waves. Tropical cyclones also create low pressure spots where water levels rise while such levels sink in areas of higher pressure. This condition aggravates the wave buildup caused by the winds. The shape of the ocean floor may affect also wave heights of the storm surge when they reach land.

Historically, storm surges occur in the city as a result of tropical cyclones. PAGASA has classified the location of Surigao as belonging to the less frequent zone or area affected by tropical cyclones entering the Philippine Area of Responsibility (PAR). From 2000-2009, none of the 193 tropical cyclones directly hit the city, although 10 cyclones affected the area at least on the level of a Public Storm Warning Signal (PSWS) No. 2 (maximum winds of 60 kph).

TROPICAL CYCLONES AFFECTING SURIGAO CITY
(PSWS No. 2 Levels & Above)
2000-2009

Year	Total Cyclones entering PAR	Category	Name	Date(s)	Maximum Sustained Winds (kph)
2009	22	Depression	Bising	Feb. 13-14	45
		Depression	Urduja	Nov. 23-25	55
2008	21	Storm	Ambo	Apr. 13-15	65
		Storm	Quinta	Nov. 6-9	85
		Depression	Rolly	Nov. 7-9	45
2007	13	Typhoon	Lando	Nov. 19-20	130
2006	20				
2005	18				
2004	25	Storm	Gener	Jan. 7-11	65
		Depression	Pablo	Sep. 15-17	55
2003	25	Depression	Zigzag	Dec. 24-27	55
2002	13	Depression	Caloy		
2001	17				
2000	19				

Source: PAGASA, www.typhoon2000.ph

Although the city may be located in a less frequent zone of tropical cyclones, its location in the country's eastern seaboard facing the Pacific Ocean makes it still vulnerable. From 1947-2002, the top 10 worst cyclones that hit Mindanao had Surigao being affected by no less than eight (8) with at least four (4) of it: Nitang, Ining, Puring and Bebeng, directly hitting the city. Super typhoon Ining in 1964 hit the city hard creating storm surges, per community historical accounts relayed through generations. It clocked an estimated 280-290 kph over water just before making landfall south of Siargao Is., Surigao del Norte.

TOP TEN (10) WORST CYCLONES OF MINDANAO
1947-2002

Name	Period of Occurrence	Highest Wind Speed Recorded	Deaths	Estimated Damage (in billion PhP)
NITANG	August 31-September 4, 1984	220 kph	1,363-3,000	4.100
RUPING	November 10-14, 1990	220 kph	748	10.846
INING	November 15-20, 1964	240 kph	400	0.010
TITANG	October 16-23, 1970	095 kph	631	1.750
PURING	December 25-28, 1993	150 kph	45	0.152
BISING	March 22-29, 1982	100 kph	288	0.590
NANANG	November 6-9, 2001	90 kph	236	3.200
AURING	January 22-25, 1975	110 kph	39	0.016
LUCY	November 25-December 1, 1962	121 kph	5(?)	undetermined
BEBENG	March 1-4, 1967	120 kph	no data	no data

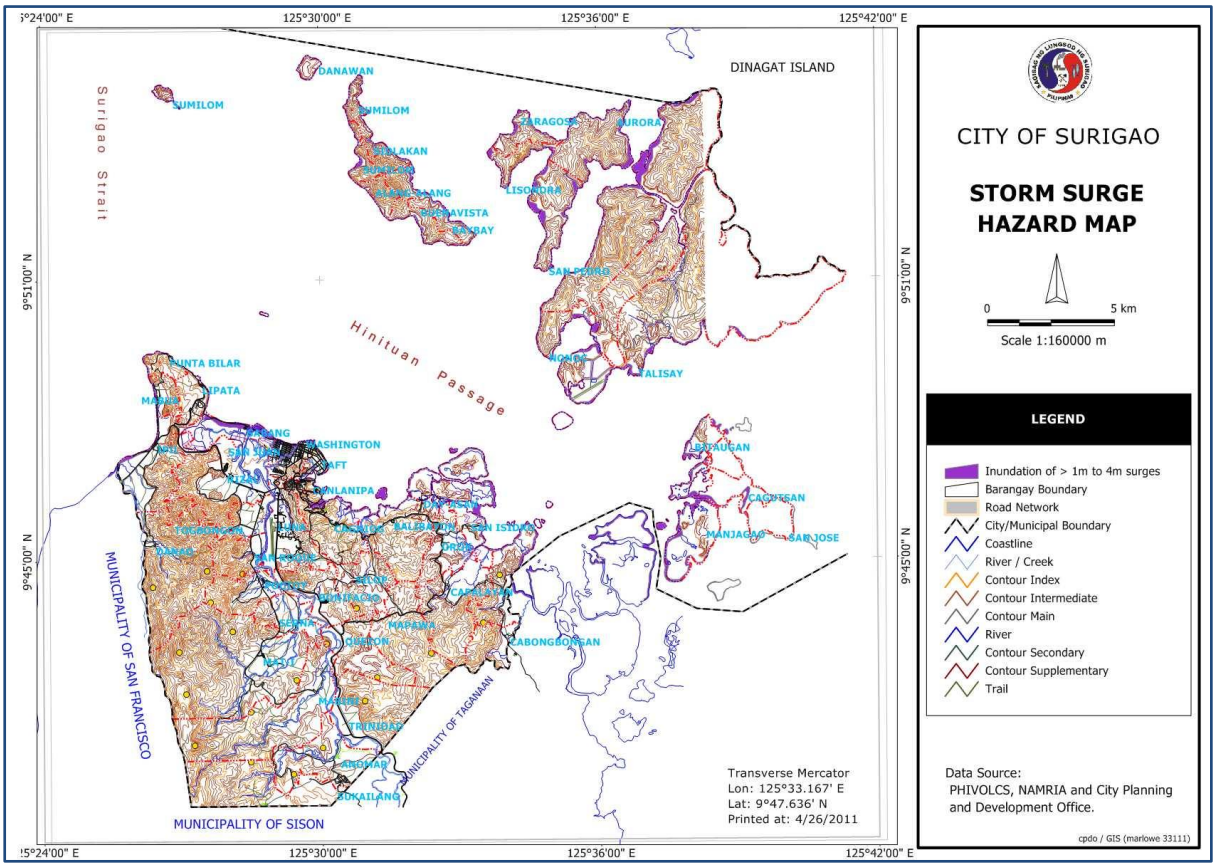
Source: PAGASA, www.typhoon2000.com.ph

Such historical accounts of strong typhoons hitting the city showed the vulnerability of its area, especially those barangays located in the coastal areas and islands. PAGASA identified no less than 35 barangays in the mainland and islands of the city as potential areas that may suffer storm surges. The inundation ranged from one (1) to four (4) meter surges. During typhoon Nitang, storm surges destroyed the city's port facilities, washed up structures in the coastal areas and even brought a cargo barge inland.

BARANGAYS SUSCEPTIBLE TO STORM SURGES
Surigao City

Alang-Alang	Cagutsan	Lisondra	San Juan
Alegria	Canlanipa	Mabua	San Pedro
Aurora	Cantiasay	Manjagao	Sidlakan
Balibayon	Catadman	Nabago	Sugbay
Baybay	Danawan	Nonoc	Taft
Bilabid	Day-asan	Punta Bilar	Talisay
Bitaugan	Ipil	Sabang	Washington
Buenavista	Libuac	San Isidro	Zaragosa
Cagniog	Lipata	San Jose	

Source: Geo-Hazard Map, PAGASA, 2007



2.1.2 Geologic Hazards

Earthquake Ground Shaking

The active earthquake generators in the city are the Philippine Fault Zone transecting the city in its western boundary with the Province of Surigao del Norte and the other one is the Philippine Trench off the Coast of Siargao Island. Any movement by these two (2) active earthquake generators will produce a worst case scenario and ground shaking reaching as much as Intensity VII to Intensity VIII based on the PHIVOLCS Earthquake Intensity Scale (PEIS).

All of the city's 54 barangays are affected by ground shaking conditions with all of the 33 mainland barangays categorized at Intensity VIII including the five (5) island barangays located in Bilabid and Bayagnan Islands. The remaining 15 island barangays in the Islands of Nonoc, Hanigad, Sibale, and Hikdop fall under Intensity VIII.

BARANGAYS AFFECTED BY GROUND SHAKING
Surigao City

INTENSITY VIII		INTENSITY VII
Anomar	Nonoc	Alang-Alang
Balibayon	Orok	Alegria
Bitaugan	Poctoy	Aurora
Bonifacio	Punta Bilar	Bilabid
Cabongbongan	Quezon	Baybay
Cagniog	Rizal	Buenavista
Cagutsan	Sabang	Cantiasay
Canlanipa	San Isidro	Catadman
Capalayan	San Jose	Danawan
Danao	San Juan	Libuac
Day-asan	San Roque	Lisondra
Ipil	Serna	Nonoc
Lipata	Silop	San Pedro
Luna	Sugbay	Sidlakan
Mabini	Sukailang	Talisay
Mabua	Taft	Zaragosa
Manjagao	Togbongon	
Mapawa	Trinidad	
Mat-i	Washington	
Nabago		

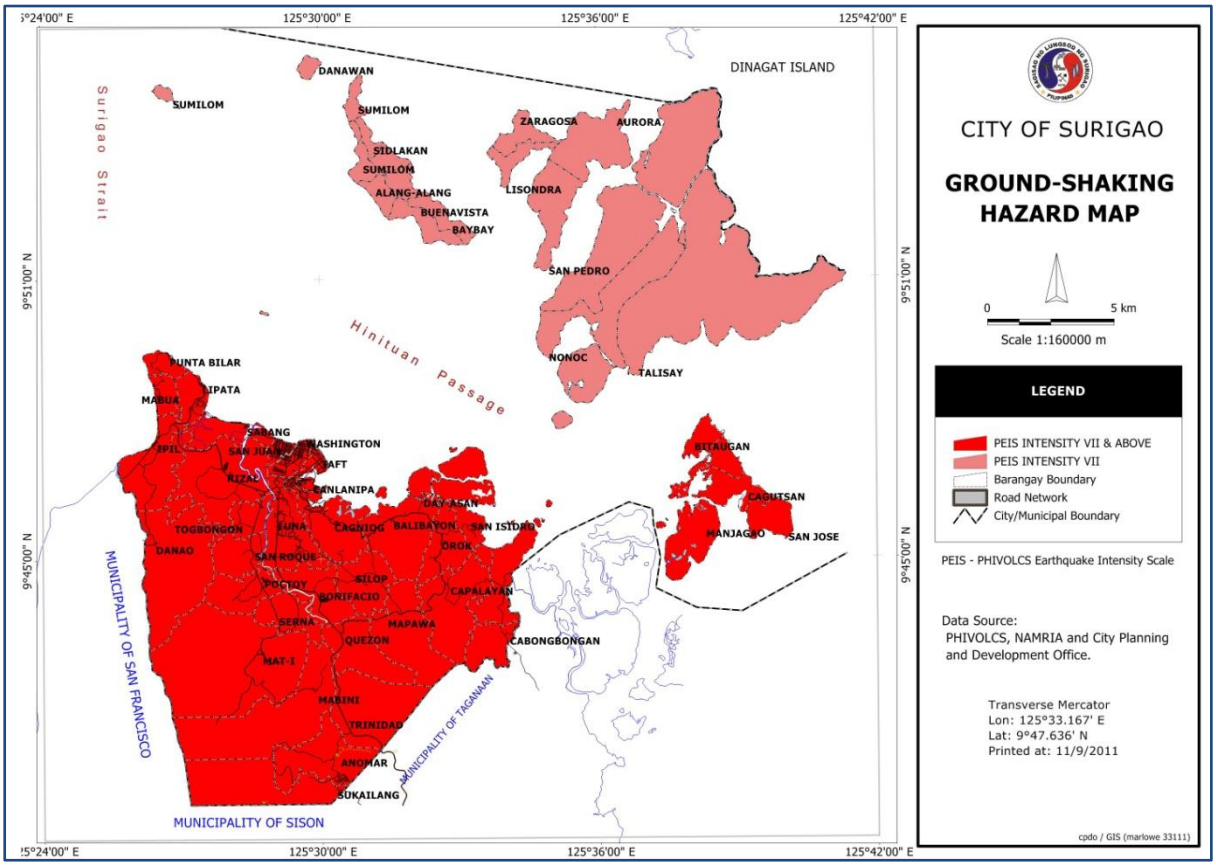
Source: Geo-Hazard Map, PHIVOLCS, 2007

With the above projected scenario of a worst case Intensity VIII ground shaking affecting the mainland where the urban area, the central business district, the government center, all utility providers, major ports and other infrastructure are located, there is a high level of risk and potential loss of lives and properties involved.

PEIS Intensity VII is characterized as destructive. Most people are frightened and run outdoors. People find it difficult to stand in upper floors. Heavy objects and furniture overturn or topple. Big church bells may ring. Old or poorly-built structures suffer considerably damage. Some well-built structures are slightly damaged. Some cracks may appear on dikes, fish ponds, road surface, or concrete hollow block walls. Limited liquefaction, lateral spreading and landslides are observed. Trees are shaken strongly. (www.phivolcs.dost.gov.ph)

PEIS Intensity VIII is characterized as very destructive. People find it difficult to stand even outdoors. Many well-built buildings are considerably damaged. Concrete dikes and foundation of bridges are destroyed by ground settling or toppling. Railway tracks are bent or broken. Tombstones may be displaced, twisted or overturned. Utility posts, towers and monuments mat tilt or topple. Water and sewer pipes may be bent, twisted or broken. Liquefaction and lateral spreading cause man- made structure to sink, tilt or topple. Numerous landslides and rockfalls occur in mountainous and hilly areas. Boulders are thrown out from their positions particularly near the epicenter. Fissures and faults rapture may be observed. Trees are violently shaken. Water splash or stop over dikes or banks of rivers. (www.phivolcs.dost.gov.ph)

Historically however, there are no recorded destructive or very destructive earthquakes that affect the city or within the immediate vicinity of the Province of Surigao del Norte in the last 50 years or more.

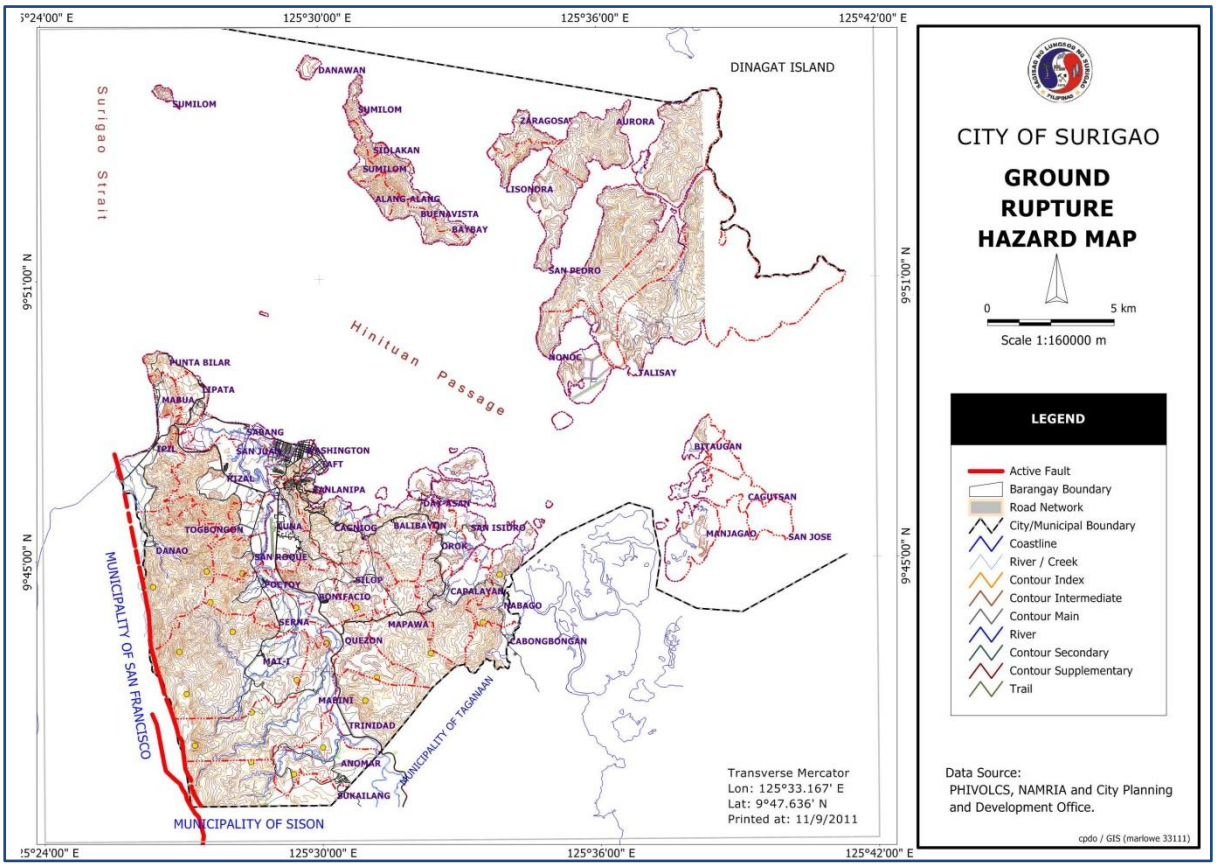


Ground Rupture

The movement of the part of the Philippine Fault Zone located west of the city may cause ground rupture. Its estimated location along the boundary of the city and the Municipality of San Francisco, more or less running along the Anao-aon River, may affect four (4) mainland barangays namely: Danao, Ipil, Mabini and Mat-i.

However, the location of the fault zone does not pose any immediate or direct threat to existing settlements or structures in the area. There are no habitable structures or settlements that are being transected by the fault zone or anything near it. Barangay Danao, the closest barangay to the fault line has its settlement area still way far off and several times farther than the minimum five-meter buffer zone. The same condition is true for the other three (3) barangays where the fault line transects along forest areas.

The only probable critical posed by ground rupture is the possible cutting off of the only road linking the adjacent municipalities of San Francisco and Malimono with that of the city and their link to the Pan Philippine Highway. This condition may affect motorists and will cause socio-economic disruption affecting the movement and exchange of goods and services.



Earthquake-Related Hazards

Given the high probability of having strong earthquakes in the locality, among the related hazards that comes with it are: earthquake-induced landslides, liquefaction, and tsunami.

Earthquake-induced landslides have already been discussed in the earlier section. For ***Liquefaction***, no less than 47 barangays of the city are affected, in varying degrees of susceptibility. 32 barangays including all of the city's urban bararangays and suburban areas are classified as highly susceptible, six (6) from moderate to high susceptibility, four (4) moderate, one (1) low to moderate and four (4) low.

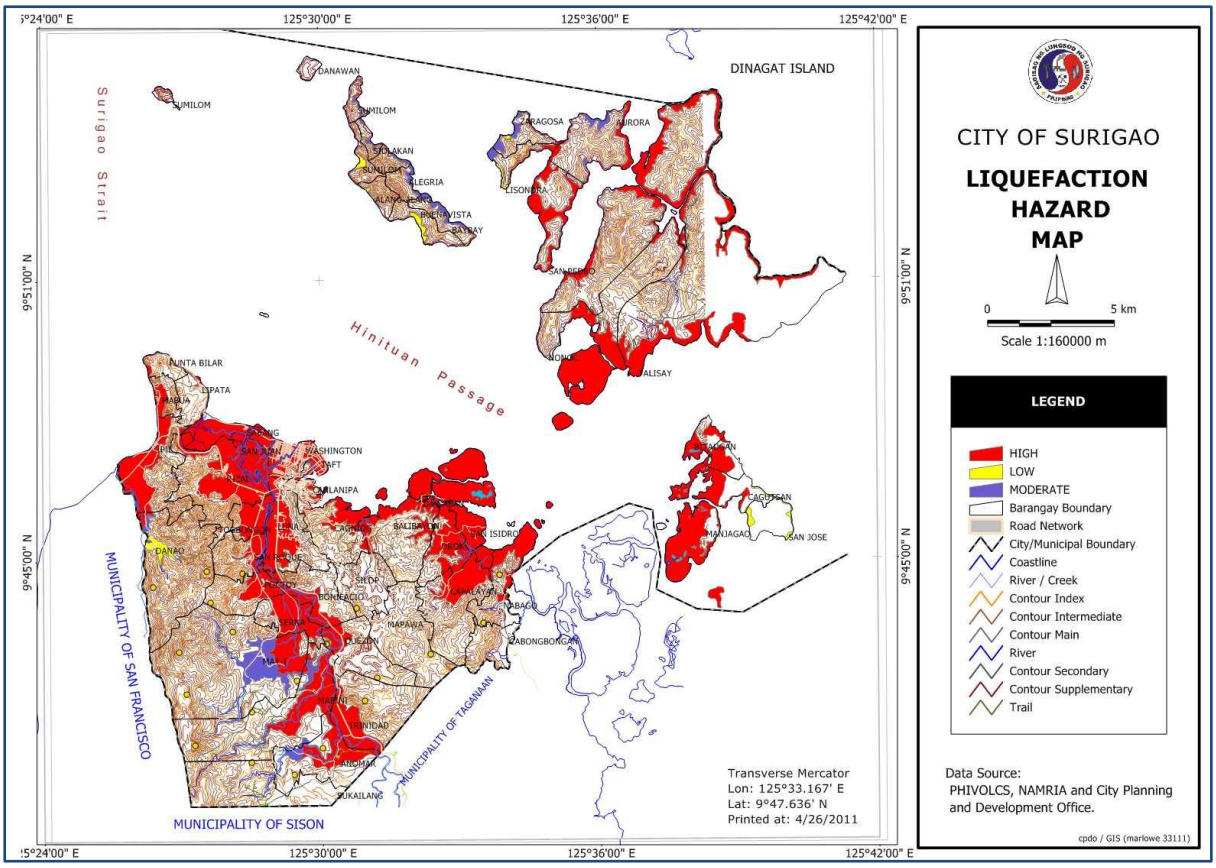
BARANGAYS SUSCEPTIBLE TO LIQUEFACTION
Surigao City

Low (4)	Low to Moderate (1)	Moderate (4)	Moderate to High (6)	High (32)
Alang-Alang	Lisondra	Alegria	Aurora	Balibayon
Buenavista		Anomar	Baybay	Bitaugan
Libuac		Catadman	Bilabid	Bonifacio
San Jose		Zaragosa	Mabini	Cagniog
			Mat-i	Cagutsan
			Nonoc	Canlanipa
				Cantiasay
				Capalayan
				Danao

Low (4)	Low to Moderate (1)	Moderate (4)	Moderate to High (6)	High (32)
				Day-asan
				Ipil
				Lipata
				Luna
				Mabua
				Manjagao
				Nabago
				Orok
				Poctoy
				Punta Bilar
				Quezon
				Rizal
				Sabang
				San Isidro
				San Juan
				San Pedro
				San Roque
				Serna
				Sugbay
				Taft
				Talisay
				Togbongon
				Washington

Source: Geo-Hazard Map, PHIVOLCS, 2007

Given the high susceptibility of urban and suburban barangays, some of which are fully built-up with population density of more than 350 persons per hectare, the threat is indeed great especially with existing structures not built to mitigate such hazard conditions. This threat is further amplified with the changing of the city's skyline where a great deal of new constructions are more than three (3) storeys high.



Tsunami is another earthquake-related hazard that may affect the city. No less than 38 barangays are susceptible to tsunami, especially if the tsunami is locally generated. The only consolation for the city is its relative safety from pacific originating tsunami because of the numerous islands off-shore, including the large islands of Dinagat, Siargao and Bucas Grande which acted as buffer and protective cover.

There were no recorded incidents or historical accounts of tsunami in the city. A hypothetical assessment of a possible local tsunami using the PHIVOLCS Rapid Earthquake Damage Assessment System (REDAS) would generate the following scenario, viz:

HYPOTHETICAL LOCAL TSUNAMI SCENARIO[1]
Surigao City

Earthquake Magnitude	8.0	8.0
Source Distance	100 kms.	50 kms.
Tsunami Run-Up	7.1 meters	10.04 meters
Off-Shore Height	2.9 meters	3.9 meters
Maximum Inundation Distance	3.54 kms.	5.70 kms.

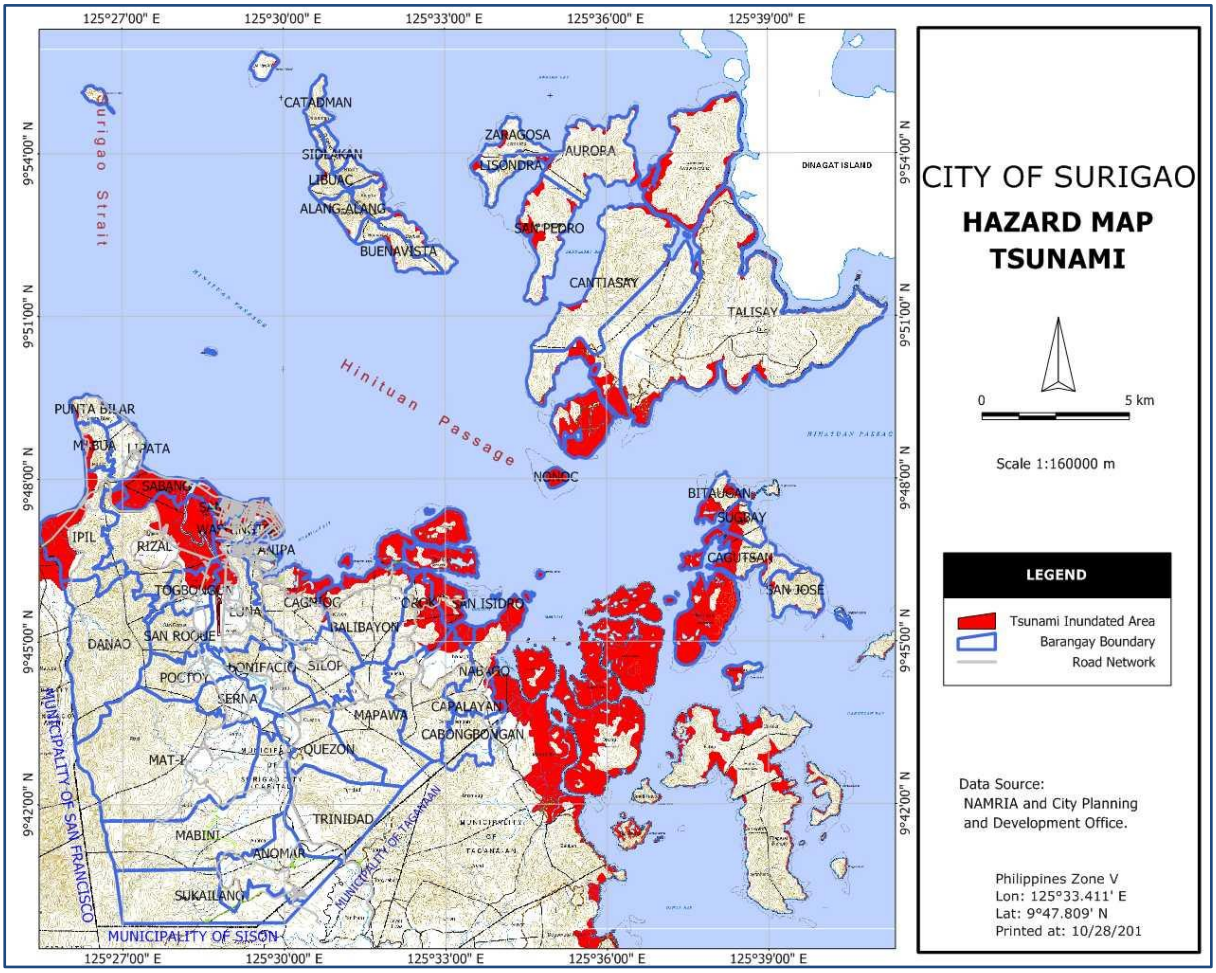
[1]*Calculations based on PHIVOLCS-REDAS Software*

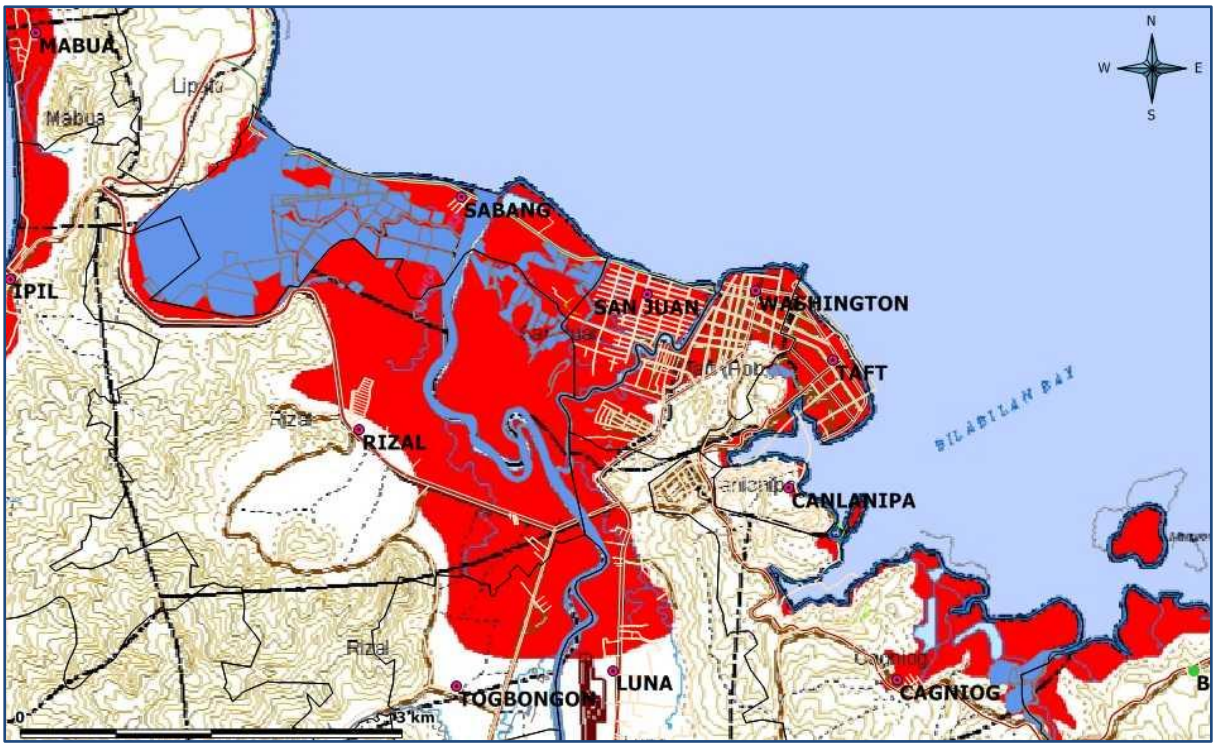
The above-cited local tsunami scenario is based on the probability of an earthquake occurring within the city's territorial waters or proximate to it like in the areas of the Leyte Gulf, Surigao Strait, Dinagat Sound, Bohol Sea and Hinatuan Passage. There is however no recorded earthquakes registering more than Magnitude 7.0 in the area in the last 100 years. The highest was Magnitude 6.8, Depth 40 kms., in the Dinagat Sound (10° North, 125°42' East) last August 23, 1975 (PHIVOLCS-REDAS).

BARANGAYS PRONE TO TSUNAMI
Surigao City

Alang-Alang	Canlanipa	Mabua	San Pedro
Alegria	Cantiasay	Manjagao	Sidlakan
Aurora	Catadman	Nabago	Sugbay
Balibayon	Danawan	Nonoc	Taft
Baybay	Day-asan	Orok	Talisay
Bilabid	Ipil	Punta BIlar	Togbongon
Bitaugan	Libuac	Sabang	Washington
Buenavista	Lipata	San Isidro	Zaragosa
Cagniog	Lisondra	San Jose	
Cagutsan	Luna	San Juan	

Source: Geo-Hazard Map, PHIVOLCS, 2007



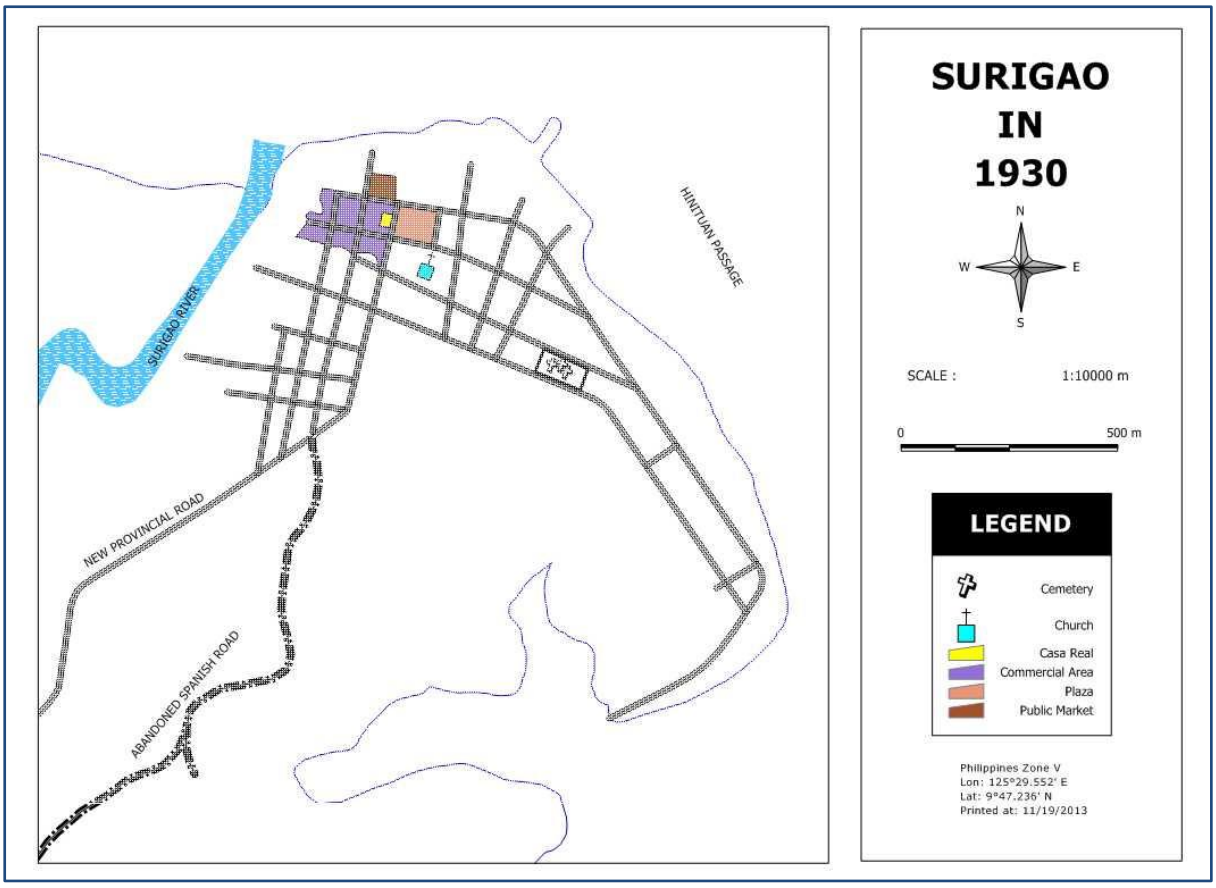


Projected tsunami inundation map in the urban and suburban areas.

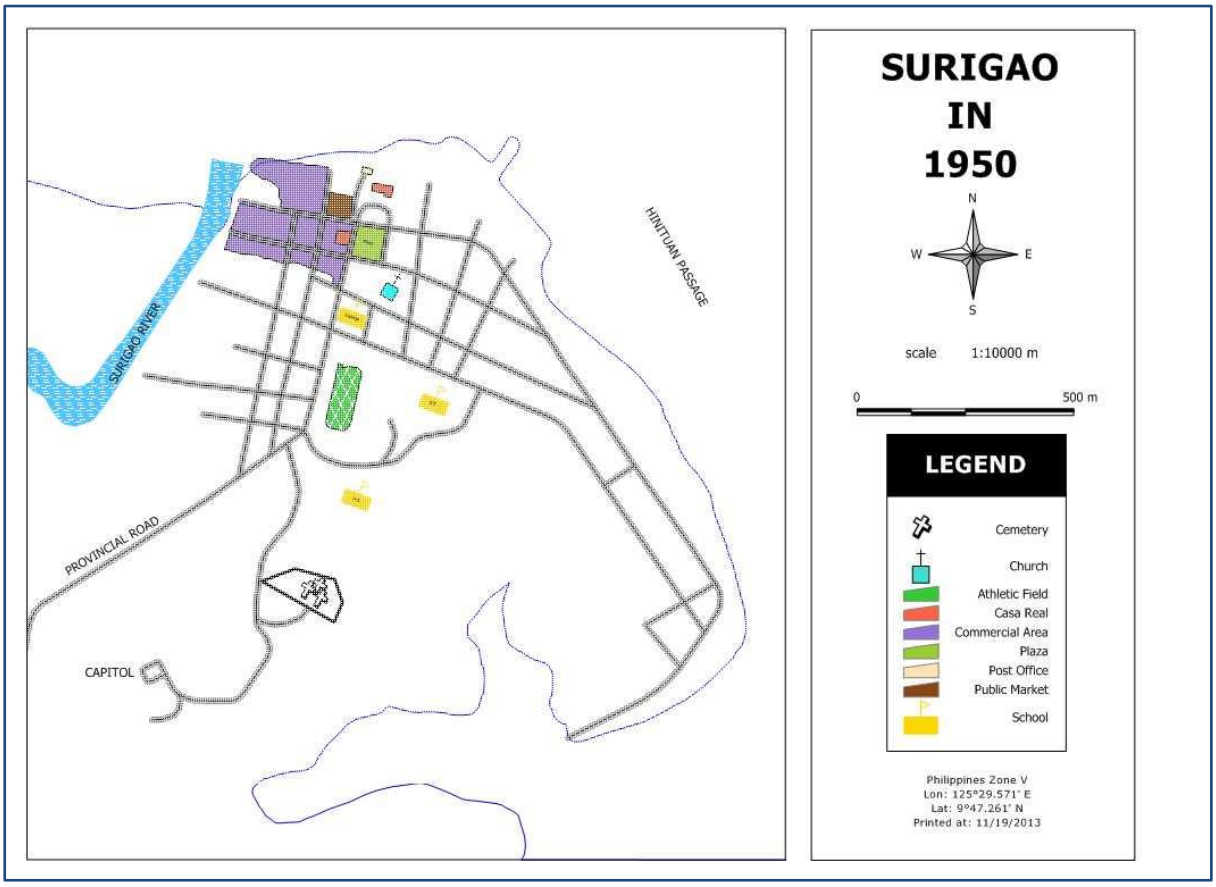
2.2 Derived Constraints

Just like any small city and historically built old settlement in the country, Surigao City also faced several man-made issues that have serious physical development implications. The major ones are the present congestion in the central business district (CBD); the narrow areas and geologic constraints of major transportation links like the seaport and airport; and the backlogs in infrastructure development which are mostly reactive owing to the city's limited capacity to finance capital projects.

Congestion at the CBD. The concentration of development and related support services in the CBD has already taken its toll through the years. In the 1930's and even in the 1950's, settlements are mostly concentrated in the coastal flat lands with practically none existing in the foothills located in the southern part and in the swampy inundated areas across the Surigao River in the western part of the *poblacion* area.

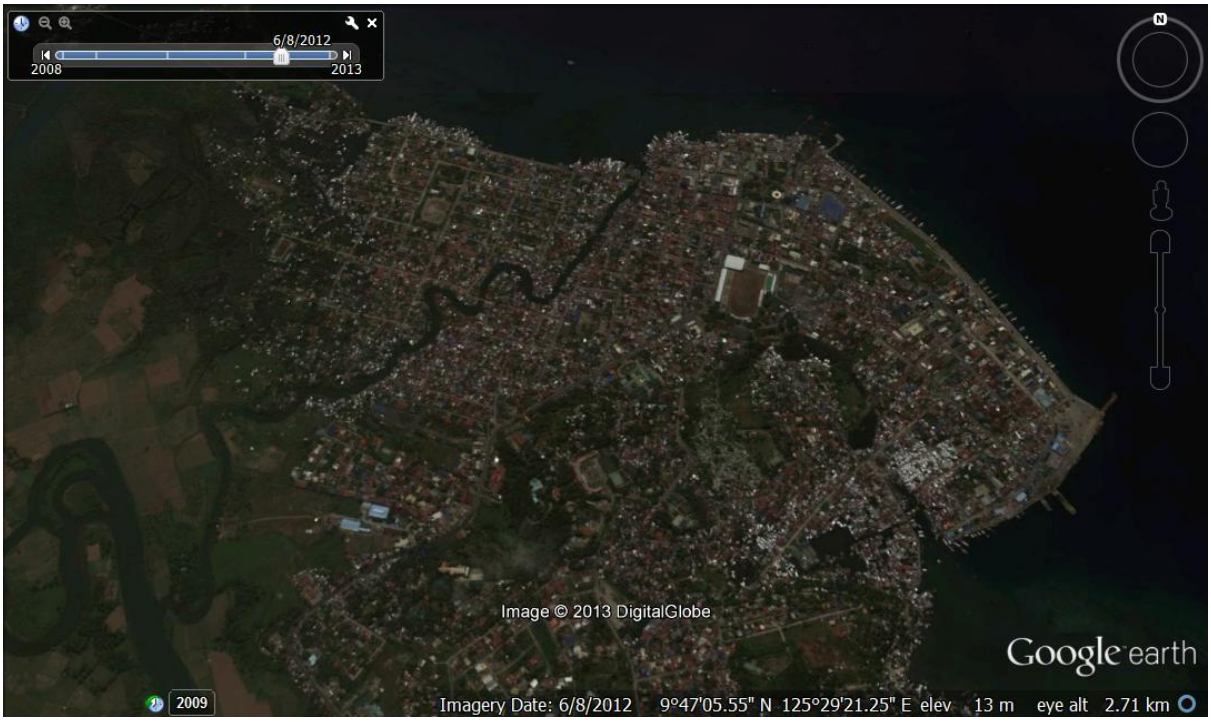


Old Surigao maps showing the concentration of settlements within the present urban core in 1930 (above) and in 1950 (below) and none beyond the Surigao River in the western portion.



Unregulated human activities prior to the first zoning regulations were put in place in 1980 have eventually encroached on swampy and inundated areas adjacent to the town center across the river, creating large settlement zones of liquefaction-prone and flood-prone areas, diminishing the city's natural basins and creating problems in the capacity of urban drainage canals to handle surface run-off water efficiently. Perennial flooding of the city's tributaries has also rendered these low-lying settlements highly vulnerable especially in such areas as the Brgys. of Taft, Washington, San Juan, Sabang and Canlanipa. The foot hills surrounding the limited flat lands near the city are also not spared from being settled and encroached on, thus creating mixed use residential communities that are highly vulnerable to landslides.

Problems in traffic and circulation are also created with the CBD primarily patterned after the Spanish *pueblo* of old, where the central market, the city cathedral, major schools, shopping centers, city park and the city hall are clustered and in near proximity with each other. The day time concentration of population in the CBD aggravated further by narrow two-lane streets also contributed further to traffic conditions at peak hours of the day. Parking regulations, setbacks and related road-rights-of-way (RROW) issues further compounded the problem of smooth circulation and congestion in the CBD.



The urban center of the city at present consisting of the CBD and the settlements that expanded across the Surigao River.

Although efforts were put in place in the past to decongest the CBD and provide for outward expansion like the location of the Lipata Ferry Terminal in the northwestern portion together with a city-owned resort facility, plus the putting up of an Integrated Land Transport Terminal in Brgy. Luna near the city airport about 4 kms. south of the CBD, these generally remained slow-paced except for two (2) major mall development projects in the past two (2) years.

Limited Land Area for the Main Seaport and City Airport. The Surigao City Base Port located in Brgy. Taft is located in a narrow strip of land. This places constraints on the quantity of sea vessels and containerized cargo that can be handled at a given time. Expansion works will eventually entail

large reclamation works and deepening of the Bilang-Bilang bay so that port capacity will be expanded to handle increased volume of trade and commerce.

The city airport on the other hand, particularly the present runway, is hemmed in by hills on its southern end and a river channel on the northern portion. This posed constraint in terms of runway extension works so that the city's airport will be able to accommodate commercial jet aircraft currently used by local carriers. Moreover, its general location is slowly being engulfed by urban expansion, which poses problems in terms of buffer requirements, airport zone height restrictions and traffic issues.

The city port area in the foreground hemmed-in by existing built-up area in the North with limited expansion area except extending further South by reclamation or pier extension.

Backlogs in Infrastructure Development. There are quite a large number of concrete roads and farm-to-market roads in the city mainland. However their present width and the obstructions on the RROW restrict their capacity to function effectively. Moreover, the absence of arterial circulation roads to connect the southern barangays of Togbongon to Mabini to the Agusan-Surigao highway restrain the development potential of these areas and continue to contribute to the strain on the main highway. The northwestern tip of the city mainland comprising the Ipil-Mabua-Punta Bilar barangays must also be provided with a coastal road linkage to provide alternate route and direct linkage to the CBD San Juan-Lipata Coastal Road. Another critical arterial link that must also be provided to allow circumferential east to west access is the road that should be provided to connect the city seaport through Canlanipa and the Arellano District highway. Circumferential roads are also absent in multi-barangay islands like Hikdop, Hanigad and Bayagnan.

Another backlog is in terms of the upgrading of ports and jetties in the island barangays which continue to pose inconvenience and inefficiencies for commuters and in the movement of goods and services. There are also issues confronting the lack of stable power supply in the islands and the still remaining number of households relying on Level 1 water supply. The off grid location of these island barangays remain a daunting challenge for the city's utilities development.

As previously mentioned, the short runway of the city airport also limits its capacity to accommodate bigger aircrafts thus seriously affecting tourism and trade potentials of the city. Compounding the problem is the limitation posed by extending the runway on the southern end which already run in conflict with the existing national highway, not to mention, the foothills in the vicinity of the south end which would affect flight approach and take-off. The northern end extension would also run across the river bend.

The City Airport showing the runway whose planned extension would entail a bigger investment cost with the southern end running almost perpendicular affecting the national highway and the northern end traversed by the Surigao River.

On the aspect of telecommunications, mobile communications has to be expanded to include coverage, especially for broadband access in remote areas and there is also the need for an increase in the present bandwidth of telecommunications provider(s) to support the operations of business process outsourcing industries in the locality.

These are the major infrastructure backlogs that have to be addressed by the city in line with the pursuit of its development vision.

CHAPTER 3
Vision-Mission Statement

3.1 Vision and Mission

Vision

In the last three (3) decades when development planning was instituted in the City of Surigao, the city's development direction revolves around the attainment of its vision of becoming an industrial, commercial and educational center in the region – particularly in its primary service and influence area in the northeastern Mindanao Pacific Rim.

As such, the development strategy focused on the optimum utilization of its natural resource base, particularly agriculture and fisheries, mining and mineral processing, and development of the tourism and services sector. This is coupled with the move to enhance educational facilities to provide an adequate pool of professionals and skilled manpower.

The varied strategies adopted in pursuit of this development vision, as stipulated in the several medium term development plans of the past years have shown substantial headway in bringing about the envisioned improvements in the life of the local constituents. As such, tourism and educational development has gained momentum and the city is now considered to be the front runner in the whole region in these sectors. Moreover, the push for industrial development is gaining ground in the past five (5) years, with renewed investor interests in the mining sector – one of the city's primary economic bases.

Thus, in the light of these significant achievements, the city's vision was revisited and ultimately re-crafted to suit better to the changing needs and present development context. As a point of caution however, such re-crafting of the city's vision should not be interpreted as a move to redirect development directions and priorities but rather, it is a move to push further development efforts to a much higher level. The newly crafted vision incorporates the pillars of the old one and it now puts emphasis on good governance and environmental quality as the new millennium special concerns for development. Environmentally quality also presupposes the need to effectively manage and reduce disaster risks and adapt to climate changes.

The city's vision then as revisited and re-crafted now states, viz:

With the blessings of the Divine Providence, Surigao in 2025: a model city for good governance, economic dynamism, and environmental quality.

Mission

In support of the city's vision and development framework, its mission statement was also consequently re-crafted. As such, the new mission statement expressed the local government's continuing commitment to strive for the attainment of a balanced and equitable development, anchored on the tenets of good governance, multi-stakeholders' cooperation and convergence. This mission statement expresses the city's responsibility towards the attainment of its development vision and greatly enhances its reason for being and purpose.

Thus, the city's mission statement now declares, viz:

To continuously raise the standards of governance through the empowerment of our citizenry. The outcomes from effective partnerships and cooperation shall secure total quality of life of all our citizens. We are open to share our own experience and learn from the best practices of other cities in Caraga, in Mindanao, and the rest of the country.

3.2 Vision Elements, Descriptors and Success Indicators

3.2.1 Qualities of the People as Individuals

In the social aspects of the vision, the drive towards being a model city presupposes the basic concern for people welfare especially the promotion of responsible citizenship, reduction of crime rates, participatory governance and community mobilization. The key is the promotion of peace-loving and responsible citizens. The *Surigaonon* is basically peaceful as evidenced by a lower crime rate compared to other cities of the same size and class. There is however the challenge of sustaining peaceful conditions with the influx of migrants amidst increasing urbanization and economic opportunities. Vigilance and responsibility of every individual member of society shall be promoted and maintained so that the existing livable conditions conducive of productivity and economic growth will remain enabled.

3.2.2 Qualities of the People as Society

Support, cooperation and convergence remain the basic elements of a peaceful and productive society. These are practically critical human elements that would bring about the success of any development design. Continuing promotion and empowerment of communities shall be pursued to include the expanded provision of basic social services aimed at capacitating the vulnerable groups and promoting healthy lifestyles to reduce morbidity and mortality incidences brought about by lifestyle-related diseases. Moreover, another critical human development component of the city's aim to become a model city is the development of a workforce responsive of its local industrial and service demands. Thus, formal education, technical-vocational training, alternative learning systems and other livelihood skills development program shall be enhanced as a vital component in its push for economic dynamism.

3.2.3 Nature of the Local Economy

The vision subsumes the basics for economic development and signifies the push for city competitiveness, thus bringing previous and present development efforts into a much higher level than just self-sufficiency and being the region's best performing city. The need for city competitiveness is greatly stressed by the pressing need to bring in investments for a more robust commerce and trade, the development of agriculture, tourism and mining industries, and the enactment of business-friendly policies.

In-bound direct investments is indispensable for the city to allow optimum development of its industrial base, expand employment opportunities to increase local purchasing power thus enhancing commerce and trade, and for it to reach economies of scale in the long run.

As such, the development strategy focused on the optimum utilization of its natural resource base, particularly agriculture and fisheries, mining and mineral processing, and development of the tourism and services sector.

3.2.4 State of the Natural Environment

Surigao is blessed with abundant natural resources and a beautiful landscape that would enable it to realize its envisioned development in the midst of preserving the integrity of its ecosystems. The necessary element that needs to be achieved in this area is to strike the critical balance between protection, conservation, resource utilization and development. The maintenance of *ecological balance between the built-up area and natural ecosystems* need to be aptly addressed not only for the basic requirements of food production, greening and natural protection, but more so for purposes of reducing disaster risks and enhancing community capabilities or resiliencies in adapting to climate changes.

The bottom line is to attain its desired level of development without adversely damaging the innate richness its natural environment. Thus, an ecosystem based approach shall be considered in urban planning so that urban expansion and the related infrastructure components of development will be analyzed thoroughly vis-à-vis its impacts in the larger environs borne out of the interplay between the ridge to reef ecosystems.

Conservation of remaining protected areas such as forests, watershed reserves, mangroves, inland water bodies and coastal reefs shall be enforced and this will be coupled with the imposition of no-build hazard zones, river easements, coastal salvage zones, agricultural and industrial buffer zones to avoid degradation and minimize risks.

3.2.5 Condition of the Built Environment

The emphasis on the development of the built environment is in decongesting the urban core, providing greater access to basic facilities, effective inter- and intra-circulation of people and goods, and in ensuring structural integrity and sound location selection to withstand or minimize losses, damages and/or casualties during calamities.

The physical development shall also take into consideration aesthetics and image enhancement to ensure both creativity and functionality. New growth areas or townships shall be established to ease the strain on the CBD and this will be complemented by the development of new roads and more multi-nodal transport system. Provision of public utilities shall be improved to include a reliable 24/7 power supply in the island barangays. Elimination of urban blight shall be continued and the enhancement of open spaces and green areas will be pursued to enhance the image and attractiveness of the urban core. Other conditions necessary in this vision element is the unclogging of canals and drainage systems, waste disposal and management. Landmarks shall be preserved or enhanced and given a distinct architectural character.

Respecting environmental constraints, other physical factors and geo-hazards shall be fully integrated in the city's development plan so that the city will retain its character of a truly livable community.

3.2.6 Capability of the Local Leadership

Another critical pillar in the city's vision is good governance, owing to the primacy of the functions and responsibilities of the local government over all other entities. Good governance provides the backbone within which the envisioned development can be achieved. It takes into account transparency and accountability, sound fiscal management, people participation, planning, legislations, customer servicing, and the fundamentals of performance monitoring.

Governance reforms and present headways achieved in terms of fiscal administration and the present recognitions in LGU performance by the Department of Interior and Local Government (DILG) shall be sustained. Standards set forth in the Local Governance Performance Management System will be the primary benchmark for further improving institutional capacity.

Convergence and collaboration shall be strengthened with the business and industry sectors, the civil society groups and the academe for these are the proven ingredients of effective governance where the success of all development initiatives is lodged.

3.3 Physical Development Goals

- Land and land-based resources optimally utilized.
- Ecological balance maintained.
- People's mobility, safety and access to social services and public facilities enhanced.
- Urban communities developed with emphasis on functionality, livability and safety.
- Production areas sustainably developed.

CHAPTER 4
Existing Land Use Strategies, Land Uses and Trends

4.1 Existing Land Use Strategies

The past and present character of the city's existing land use is more or less concentric in form with heavy historical development emanating from the pueblo system which now comprises the present CBD. Expansions from the CBD or the town center spread across in practically three (3) directions hemmed in generally by the coast in the northern portion. The extension of the CBD in the last three (3) decades followed a dispersed sheet development trend; first emanating from road sides and later on catching up to form a bigger node or core city emanating from the coastal area expanding west, south and east. Even swampy inundated areas like San Juan and portions of Washington that are generally not suitable for development and are hazard-prone were also eaten up by urbanization.

4.2 Urban Growth Corridors and Nodes

In order to arrest the seemingly unregulated spread of urban settlements, the city during its first land use and zoning in the 1980's and later on in the successor and current plan done in the year 2000, adopted the linear corridor development strategy with a three-pronged development corridor emanating from the city center and running across the major highways. The primary growth corridor is the Surigao-Agusan Road with Brgy. Luna as the growth node for commercial strip development and general urban expansion. The city airport and the transfer of the integrated land transport terminal would serve as the catalyst for this planned growth expansion.

The other growth corridor would run across the San Juan-Lipata coastal road which is envisioned to be a rest and recreation, tourism-related and high-end/R1 residential suburban development for the west coastal cluster of Lipata, Punta Bilar, Mabua and Ipil. The catalyst for this area is the Lipata Ferry Terminal, the subdivision developments in its vicinity and the beach resorts dotting the coast.

The third growth corridor would run across the national highway of the Arellano District comprising the Canlanipa-Cagniog to Capalayan area. This would again cover settlements and residential expansion and also a distinct character of agro-industrial development. A project envisioned in the mid-1990's of an Industrial Estate Development in Brgy. Balibayon and the planned transfer of the industrial port of Pacific Cement Company in Brgy. Cagniog serve as the catalyst to spur growth in this corridor. Residential subdivision developments in the Canlanipa-Cagniog area also provided the added development boost.

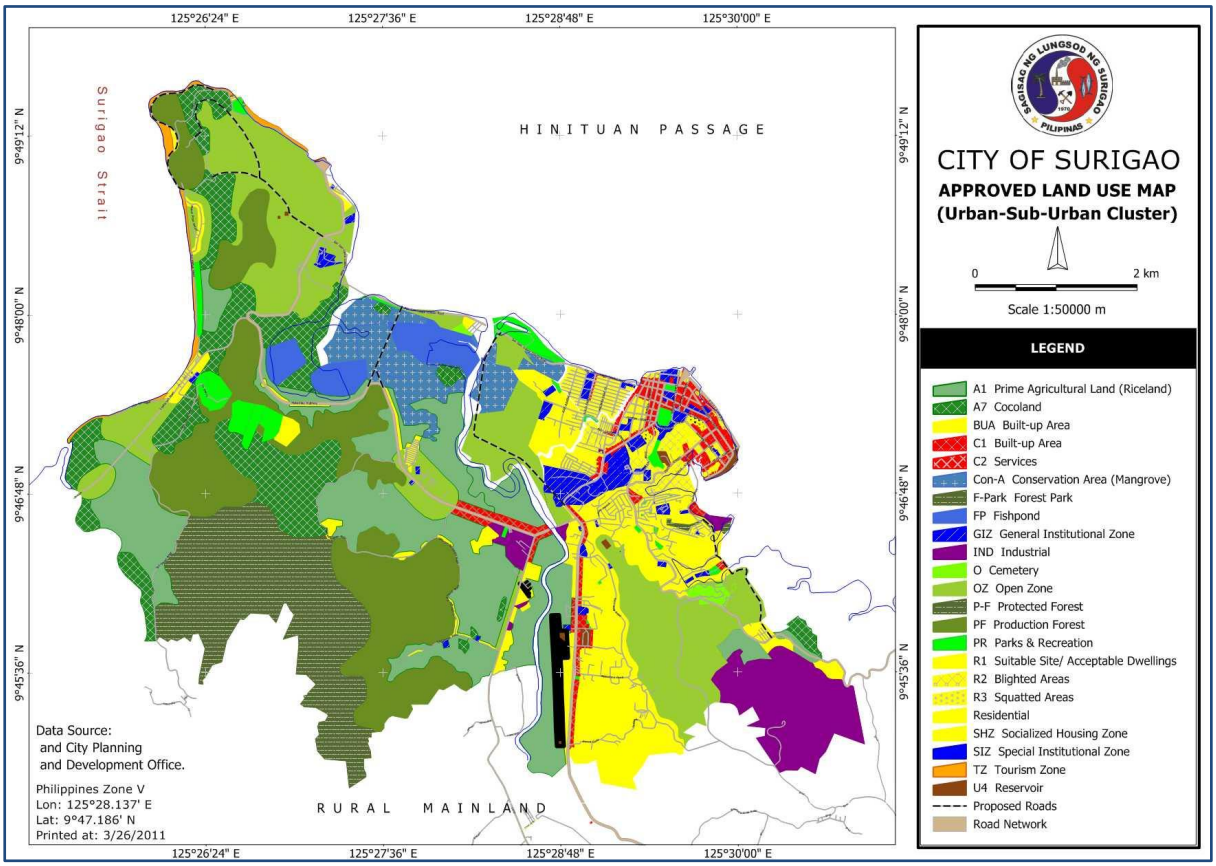
Urban land use covers the five (5) urban barangays of Washington, Taft, San Juan, Canlanipa and Luna; and the suburban areas of Cagniog, Rizal, Togbongon in the south and southeast; and Sabang, Lipata, Punta Bilar, Mabua and Ipil in the western portion.

4.3 Urban Land Use

4.3.1 Residential Land Use

Historically, residential areas in the city were mostly confined to Barangay Taft and Washington. Eventually, the increasing number of population brought about by the migration of people from the two (2) major islands of Surigao del Norte – Siargao and Dinagat- and even from the neighboring municipalities and province of Leyte led to the establishment of housing subdivisions, institution centers and service facilities in contiguous barangays. This residential sprawl was manifested particularly in Kaskag, Barangay Washington and Barangay San Juan with the transformation of a wide expanse of marshland into a dumpsite thence a residential area. The same was true for Barangay Luna. Congestion in Washington and Taft led to the expansion of the urban area in Barangay Luna. As a result, subdivisions and residential houses sprouted and proliferated in the said barangay. Its strategic location along the Surigao-Agusan National Road and its character of being sparse, made Luna attractive to habitation and business. Likewise, the acquisition of a 25-hectare property by the City Government in Barangay Canlanipa for its Housing and Resettlement program catalyzed the spread of residential areas in the area.

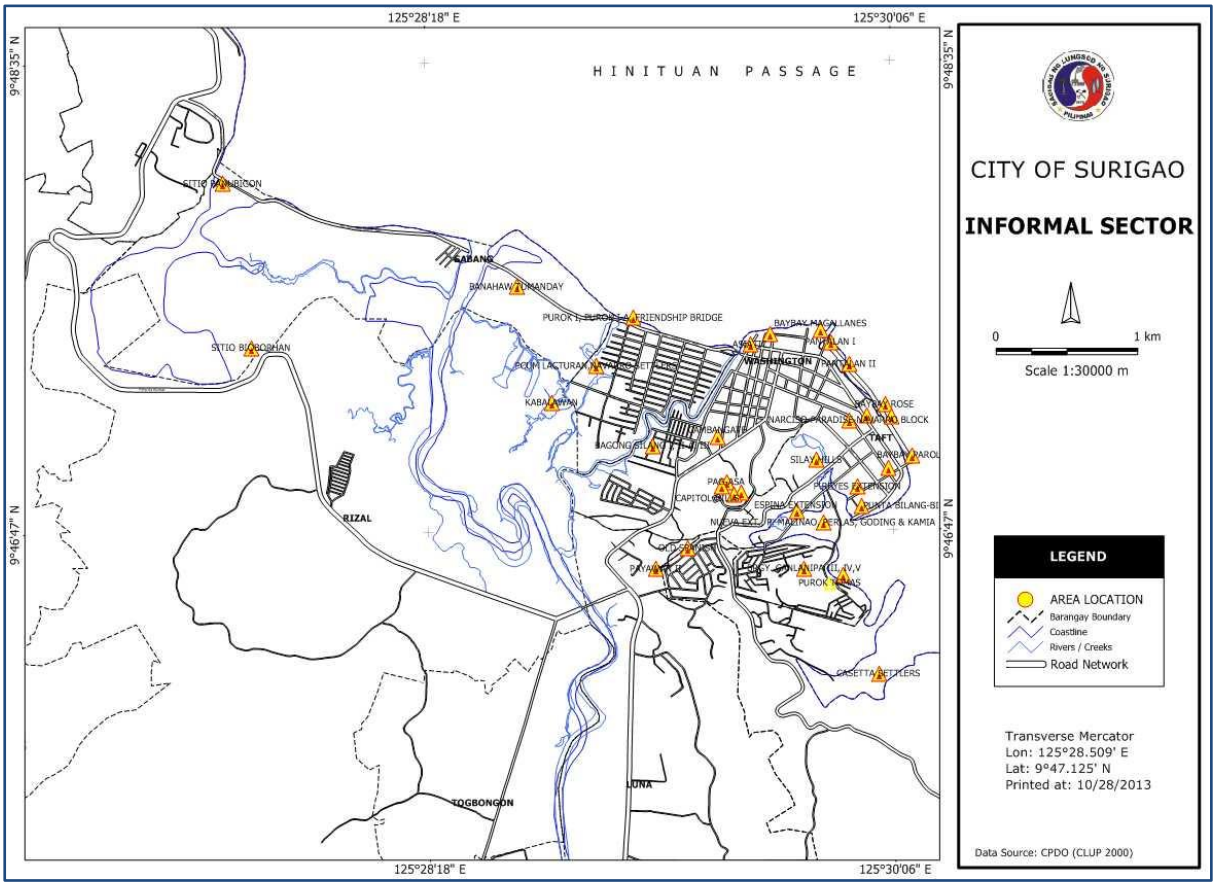
The actual land use of the city based on GIS data showed that of the 25,903.16 total land area, 381 hectares are designated as residential areas. This is mostly concentrated in the urban and sub-urban zones with a total of about 361 hectares. On the other hand, about 20 hectares comprising of subdivisions are located along portions of rural mainland areas. Most of the residential areas in the rural mainland, however, as well as in the rural islands are incorporated under the built up category with mixed land uses owing to their compact characters.



About 660 hectares of settlement areas located mainly in the urban and sub-urban zones in the city remain classified as Timberland, however, this is already in conflict with its existing land use.

Inasmuch as the titling of individual lots cannot be approved by the Department of Environment and Natural Resources, no development in these areas can be introduced. The reclassification of these timberland areas to alienable and disposable is pending upon the passage of a law that will finally give security of tenure to the occupants who have lived there for more than 30 years.

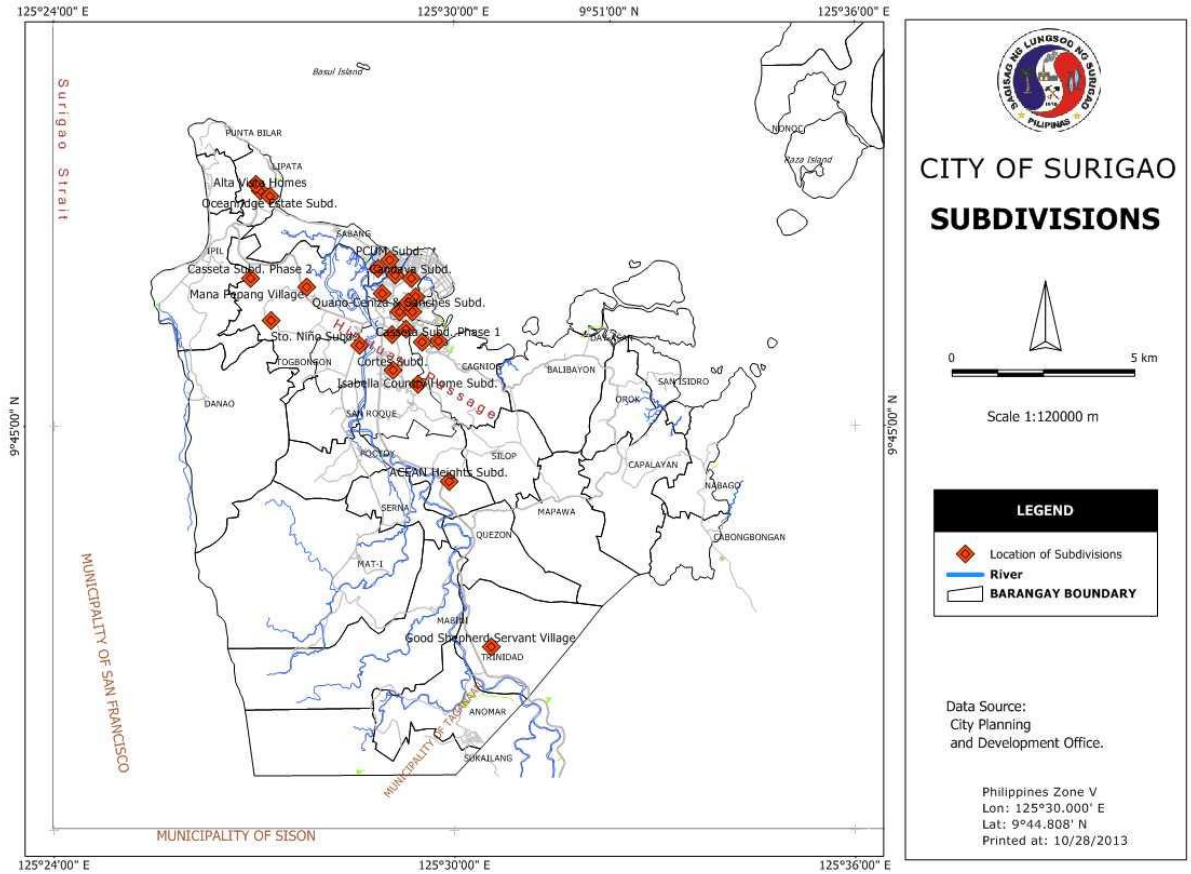
Over the years, numerous informal settlers have sprouted in built-up areas of Barangay Taft, Washington, Canlanipa and San Juan. About 50 hectares of urban and sub-urban lands are considered as blighted areas congested with informal settlers. These areas are not environmentally sound – some are located near the shoreline or along water tributaries where the water level rises during heavy rains (i.e. Sitio Alingit in Barangay San Juan, Asiatic in Barangay Washington, Banahaw Tumanday in Barangay Sabang); others are built in or close to unstable slopes, thereby precariously exposing lives to the dangers of landslides (i.e. Upper Bonotan in Barangay Washington, and Silay Hills in Barangay Taft). There is an estimated 1,483 families who are informally settling in these identified danger zones. An additional of about 425 families are located within the critical area of Upper Bonotan.



Location of informal settlements concentrated mostly in the urban area and a few located in the suburban areas of the city.

Based on the 2004 Geological Hazard Survey conducted by the Mines and Geo-Sciences Bureau, several areas in the city are critically flood-prone due to the occasional inundation of the Surigao River and other water tributaries proximate to the area during the rainy season compounded by the rise of the tide or the obstruction and artificial damming of culverts. This exposes several of the city subdivisions to risk, particularly those located in Brgy. Washington (Villa Corito and Imelda Village), in Barangay San Juan (PCUM subdivision and the Navarro Surigao Settlers Subd.), in Barangay Luna (Cortes Subd. and the Isabella Country Homes), and in Barangay Rizal

(Mana Pepang Village). Siltation occurs as a consequence to riverbank scouring and this also contributes to flooding. Silt has encroached some residential houses especially in the Barangays of Bonifacio, Ipil and Cagniog. In addition, 47 areas in 28 barangays are also considered as critically landslide-prone due to steep slopes and bedded sedimentary rocks, and the lack of buffer zones. Undercutting and alteration of slopes also increases landslide hazards. Subdivisions located in the hilly areas of Barangay Cagniog (Ouano Ceniza Heights), Canlanipa (Canlanipa Housing, Teacher's Homesite) and Lipata (Oceanridge Estate) are particularly vulnerable to rain/earthquake-induced landslides.



Location of approved residential subdivision projects in the city mainland.

4.3.2 Commercial Land Use

The city's commercial activities in the past two (2) decades were generally confined within the Central Business District and the urban core. Shopping and market activities were concentrated mainly in the traditional *poblacion* areas near the vicinity of the city hall. Later on, some commercial activities started to extend towards the port area and in the newly developed city boulevard. It was only in the recent two to three years when large scale commercial development was situated away from the CBD and into the city's envisioned commercial strip development in Barangay Luna near the integrated land transport terminal. These mall locators eventually influenced other commercial activities within its immediate vicinity.

Using GIS generated data, Surigao City's existing commercial land use is approximately 37.0 hectares in the urban and sub-urban zones. This comprises about 1% of the total land use area of 3,805.03 hectares. While in the rural mainland and rural island barangays, commercial areas have been integrated in the built up area, along with residential as well as institutional areas.

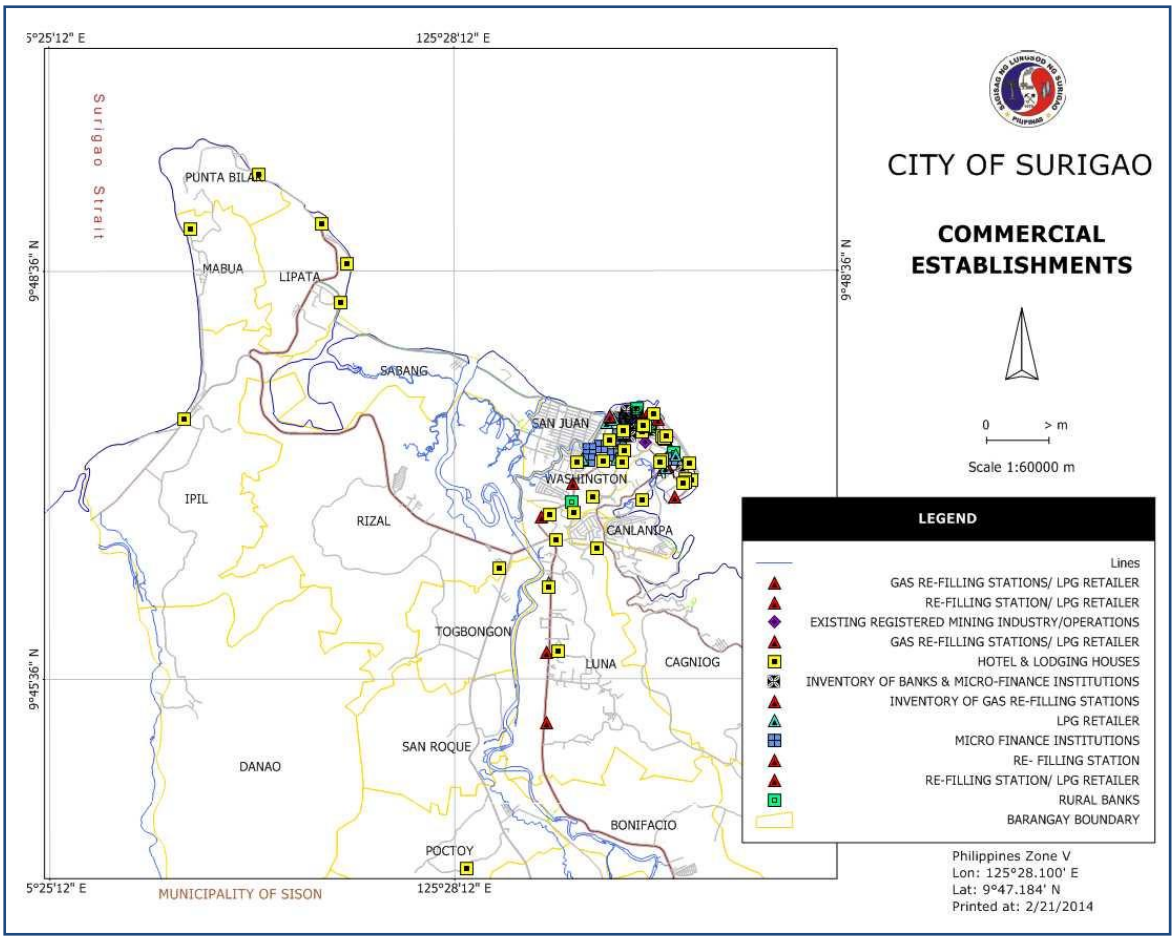
Majority of the city's commercial areas and commercial complexes are located within the urban center or the central business district specifically at Brgys. Taft and Washington.

Among the busiest commercial strips/complexes within the CBD are the commercial shopping centers, government and private entities, city public market, fish landing areas, port sites and the schools.

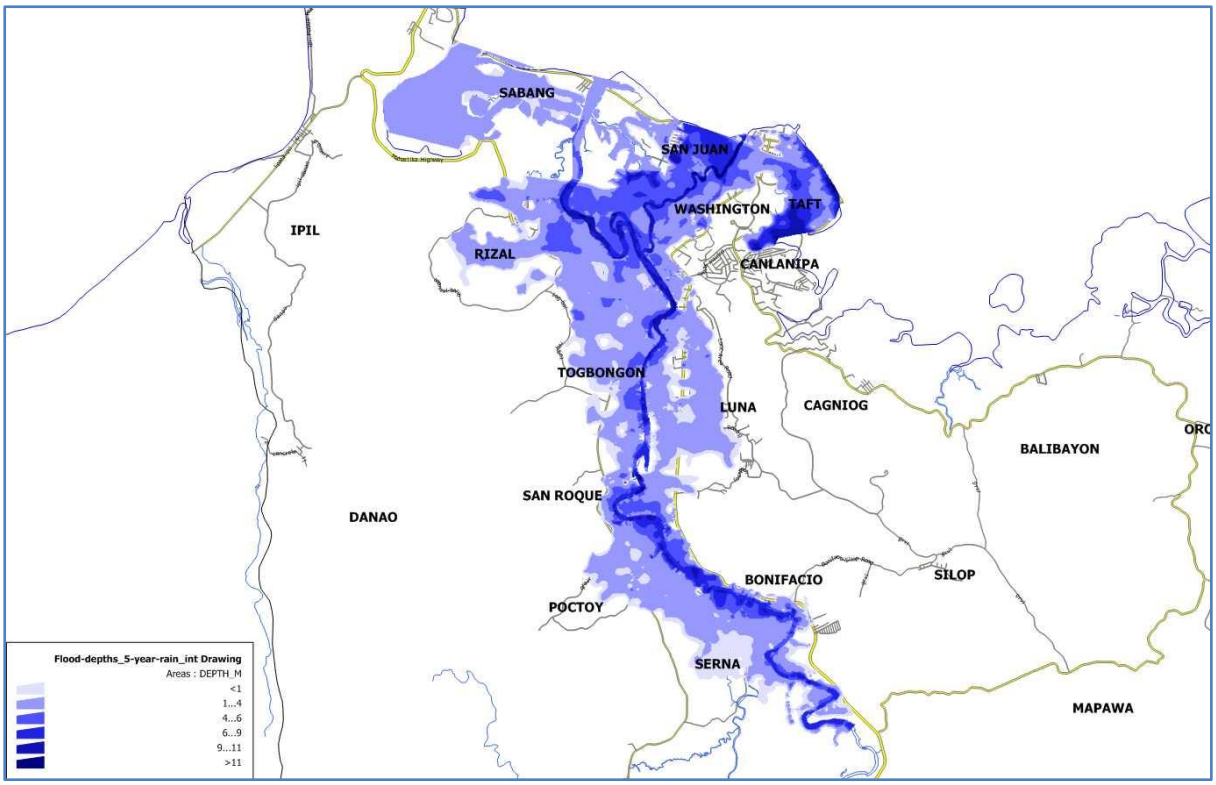
The city's public markets of wet and dry type are located within the CBD particularly in Brgy. Taft. One is the "Central Public Market" situated at the urban center; and the other one is the "Talipapa" in Nueva Extension. In general observation, the city public market contributed to urban congestion and traffic jams outside its periphery especially during peak hours since it sidewalks were already utilized as display centers of various goods and other services.

With the over concentration of commercial activities within the CBD, it is observed that the city's CBD is congested in terms of urban commercial space and business transactions resulting to the utilization of several sidewalks for business transactions and traffic jams especially during peak hours. This is due to the fact that the CBD occupies 10% of the total urban area which exceeded the standard of 3%.

The other commercial strips and commercial complexes are located within the sub-urban areas, such as: Brgys. San Juan, Sabang, Luna, Canlanipa, Cagniog, Rizal, Togbongon, Ipil and Lipata. The most notable projects contributing to the development of the commercial strip in Luna area is the entry of two (2) mall development projects and other commercial activities. The development of a new campus of St. Paul University for elementary and secondary also catalyzed urban expansion in the area.



With regards to the hazard vulnerabilities of the abovementioned commercial areas, most of the structures within the CBD of Brgys. Taft, Washington and San Juan are not affected of the two-year flooding, except for few establishments that will be affected of an average 0.51 meters flooding at Kaskag Village, Brgy. Washington. Meanwhile, on the five-year flooding scenario, most of the commercial areas / establishments located within the CBD will be affected with flooding ranging from 0.40 masl to 10 masl. Brgy. Washington will be affected ranging from 0.50 masl to 6 masl; while Brgy. Taft will be affected with flooding ranging 0.40 masl to 10 masl. The city's central public market will be affected with flooding of about 2.46 masl; while the Nueva Public Market will be submerged by nine (9) masl.



Flood inundation scenario based on a five-year rainfall average.

With regards to storm surge, most of the commercial and tourism establishments that will be affected are located along the coastal areas of Brgys. Taft, Washington, San Juan, Sabang, Lipata, Punta Bilar and Ipil.

As to rain induced landslides and earthquake induced landslides, majority of the commercial and tourism establishments located at Brgys. Taft and Washington are not susceptible to this type of hazards. However, there are three (3) tourism related establishments located at Brgy. Washington which is moderately susceptible to rain induced and earthquake induced landslides due to its location to moderately sloping area. In Brgy. Luna, there are two (2) hotels which are moderately susceptible; while in Brgy. Lipata and Brgy. Mabua, two (2) hotels and one (1) hotel respectively are highly susceptible to abovementioned type of hazards.

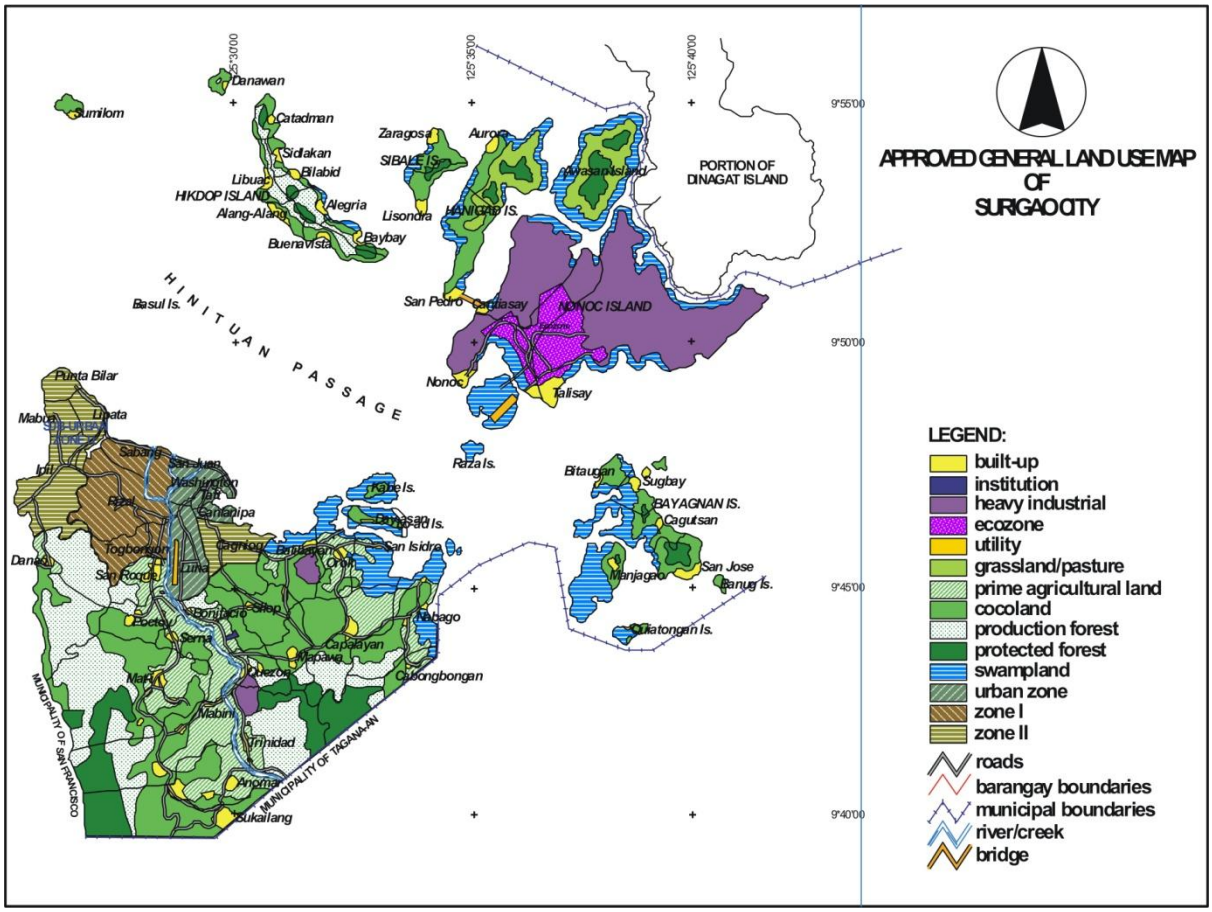
4.3.3 Industrial Land Use

Industrial development based primarily on mining started in the post-war era when gold extraction activities were undertaken by the Mindanao Mother Lode Mines, Inc. in the nearby Mabuhay area, now part of the Municipality of Sison. In the mid-1960's, Pacific Cement Company started its plant operations and in 1969, the exploration of the nickel deposits in Nonoc Island started. It was in 1974 when the first nickel briquette was produced by the Marinduque Mining and Industrial Corporation, the operator of the Nonoc nickel refinery. All other industrial activities are either cottage or micro-industries manufacturing food products, construction materials and other consumer goods for local consumption.

The existing industrial land use for the city's industrial zones cover about 4,074.87 hectares. Table below shows the existing inventory of the city's industrial land use.

Land Use Category	Industrial Area (has.)
Urban and sub-urban	6.45
Rural Mainland	23.22
Rural Island	4,045.20
TOTAL	4,074.87

Source: GIS data

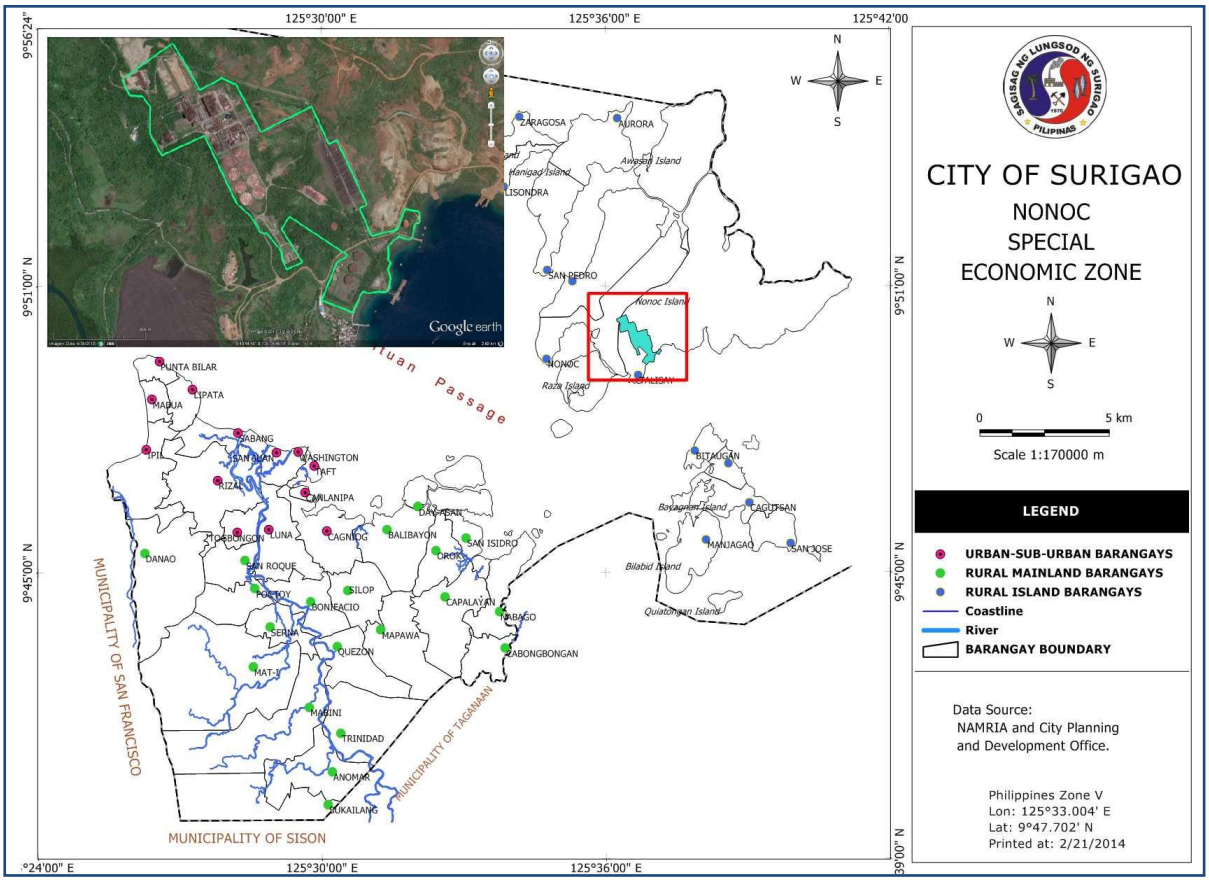


Approved land use map showing the location of lands zoned for industrial use.

The existing industrial land use are comprised of light industries operating in non-pollutive/non-hazardous degree; medium industries operating in non-pollutive/non-hazardous degree; and heavy industries operating in a highly pollutive/hazardous in nature.

Most of the light and medium industrial land uses were allocated at the central business district particularly at Brgys. Taft and Washington and along the commercial strips of Brgys.Rizal and Togbongon. Meanwhile, the rural mainland was dominated with heavy industrial land use located at Brgys. Quezon and Trinidad due to the existing operation of the Pacific Cement Philippines, Inc. (PCPI) which is engaged in the manufacture and production of cement.

The other heavy industrial land use was located at the rural island, particularly at Brgys. Nonoc and Talisay owing to the operation of the Surigao Nickel Refinery which is currently on shut down status since 1986. A portion of the Surigao Mineral Reservation in Nonoc Island of about 106 hectares has been declared a Special Economic Zone for heavy industries under Presidential Proclamation 192, dated October 06, 1999. This is considered a development strategy to revive the operations of the mothballed Nickel Refinery.



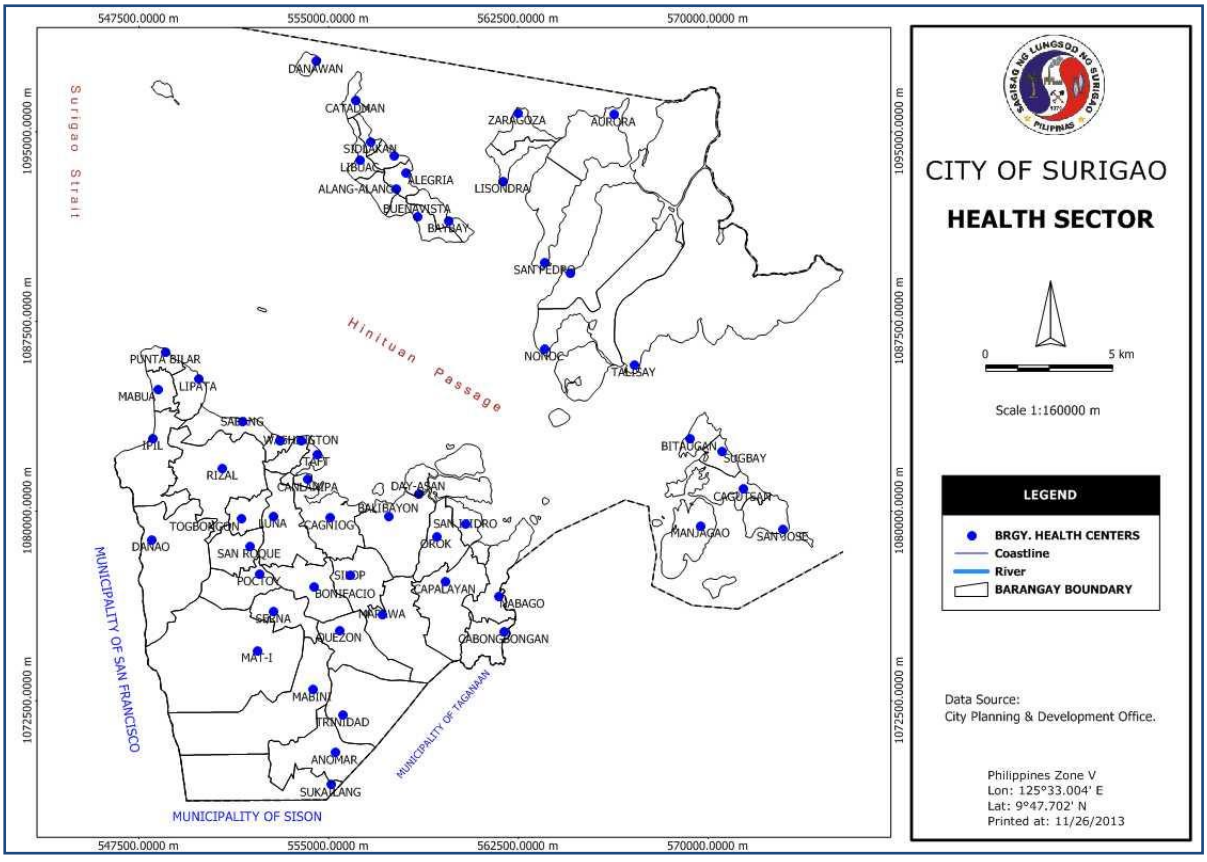
Map showing the location and layout of the Nonoc Island Special Economic Zone.

With regards to liquefaction hazards, industrial areas in Brgys. Taft, Washington, Rizal, Togbongon, Quezon, Nonoc and Talisay are highly susceptible to liquefaction, while Brgy. Trinidad is not susceptible to any liquefaction.

2.1.4 Institutional Land Use

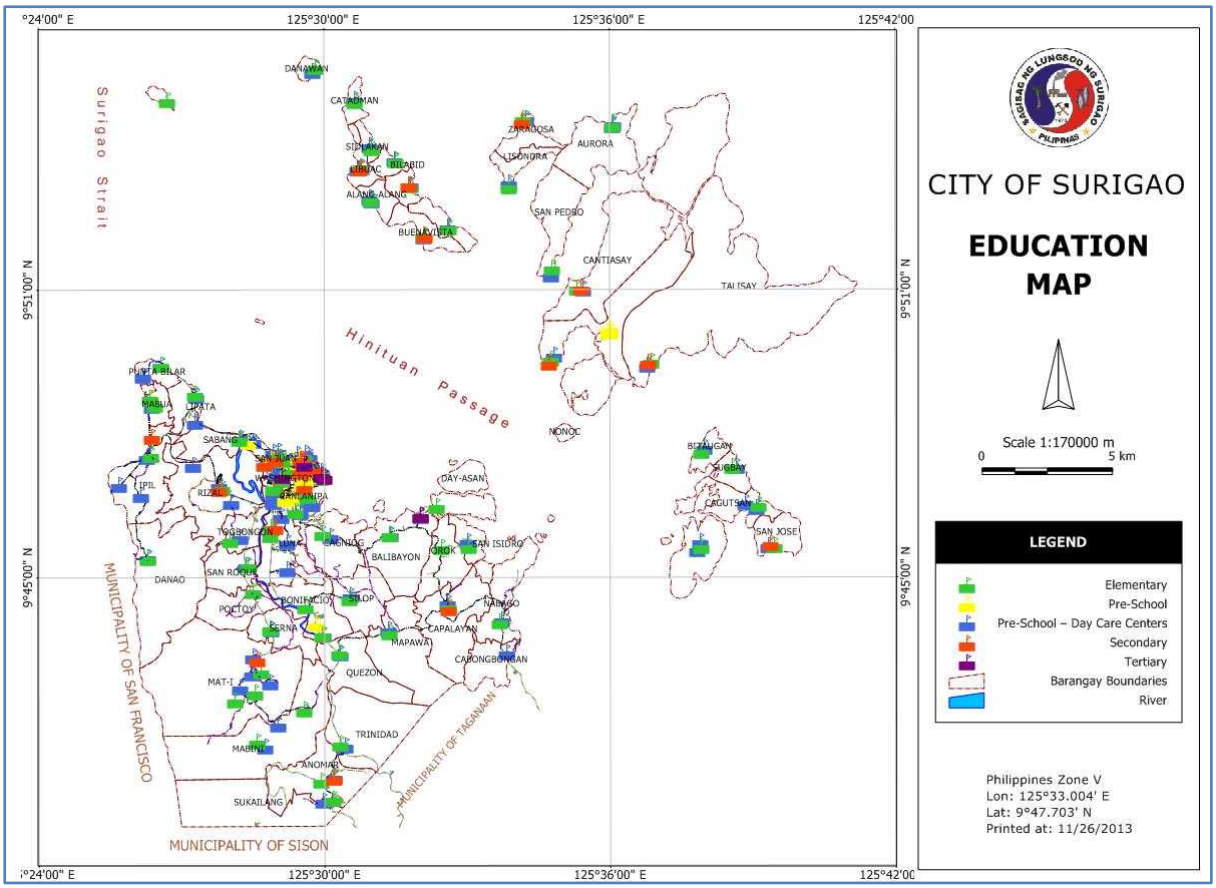
The actual land use for Institutional areas is pegged at 89 hectares: 59 hectares in urban and sub-urban zones and 30 in the rural mainland area. This sector takes into account major facilities such as educational institutions, medical institutions, religious institutions, military reservation areas, as well as government and private offices.

Surigao City is composed of 54 barangays, 21 of which are in the islands. While every barangay has a health center, most of the health facilities, which includes three (3) secondary and 1 (1) tertiary hospital, which is a Regional Hospital and private medical clinics, however, are concentrated in the urban and mainland barangays. In effect, the delivery of basic health services is not equitably distributed and the needs of the populace are not adequately or immediately met. This leads to relatively high morbidity, maternal, infant and child mortality in the islands and far-flung barangays. There is, therefore, a need to develop additional cluster serving health centers and birthing homes to serve the people in these areas.



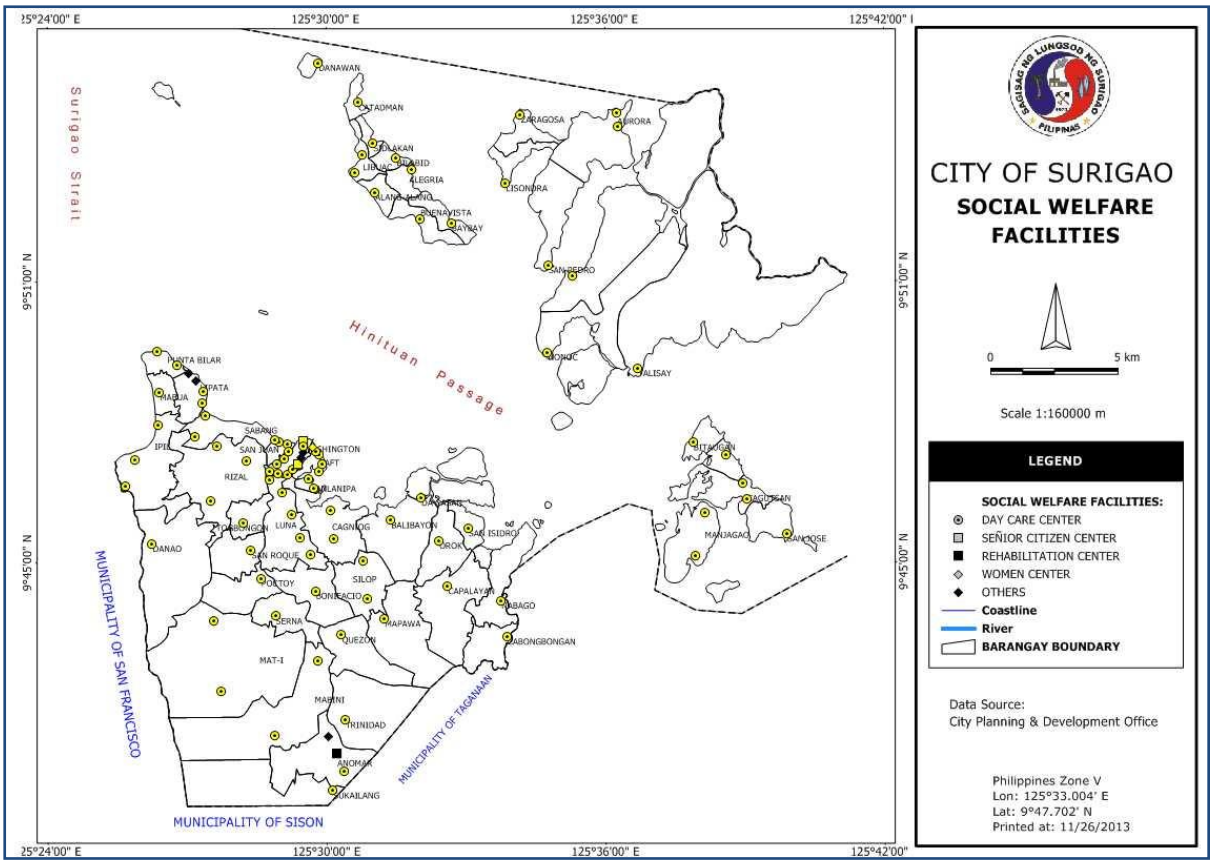
Map showing location of health facilities in the city.

There are 65 public and 12 private elementary schools; 22 public and 6 (six) private secondary schools, 10 tertiary/Higher Education Institutions, which include one (1) State College, a sectarian University, a School of Law, and Tech-Vocational schools.



Map showing location of educational institutions in all levels in the city.

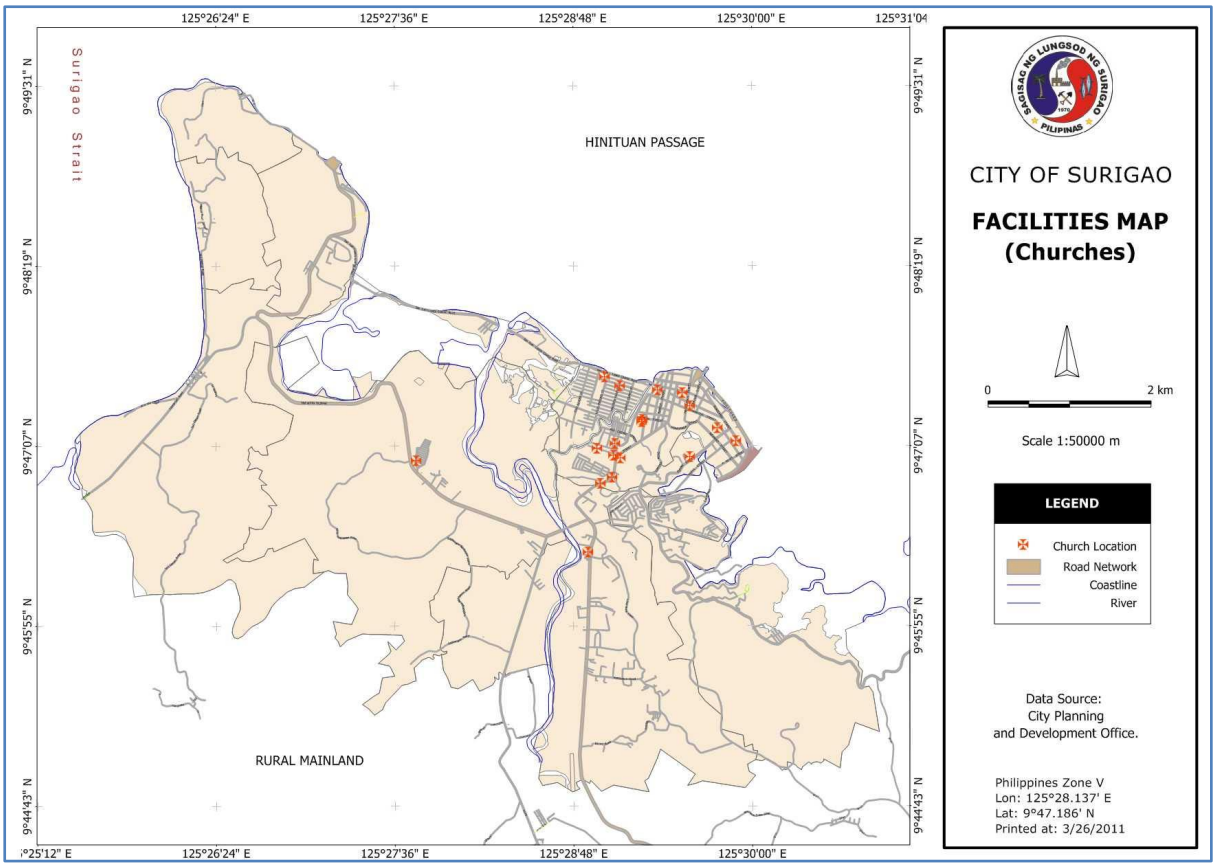
On the other hand, in terms of social welfare facilities, there are 87 day care centers distributed in the 54 city barangays, one (1) senior citizen center, one (1) Day Care Resource and Knowledge Center for Children, one (1) Crisis Center for Women and Children and a "Tawag" Resource Center (or a Day Care Center for special children) located in Barangay Washington. Moreover, there is a residential Center for street children and a halfway home for children in conflict with the law (on-going construction) in Brgy. Anomar. In Brgy. Lipata, specifically at the Lipata FerryTerminal, there is the so-called "Bahay Silungan sa Daungan", which serves as a halfway house for victims of trafficking. These facilities are well-maintained and serviceable to the targeted populace.



Map showing location of social welfare facilities in the city.

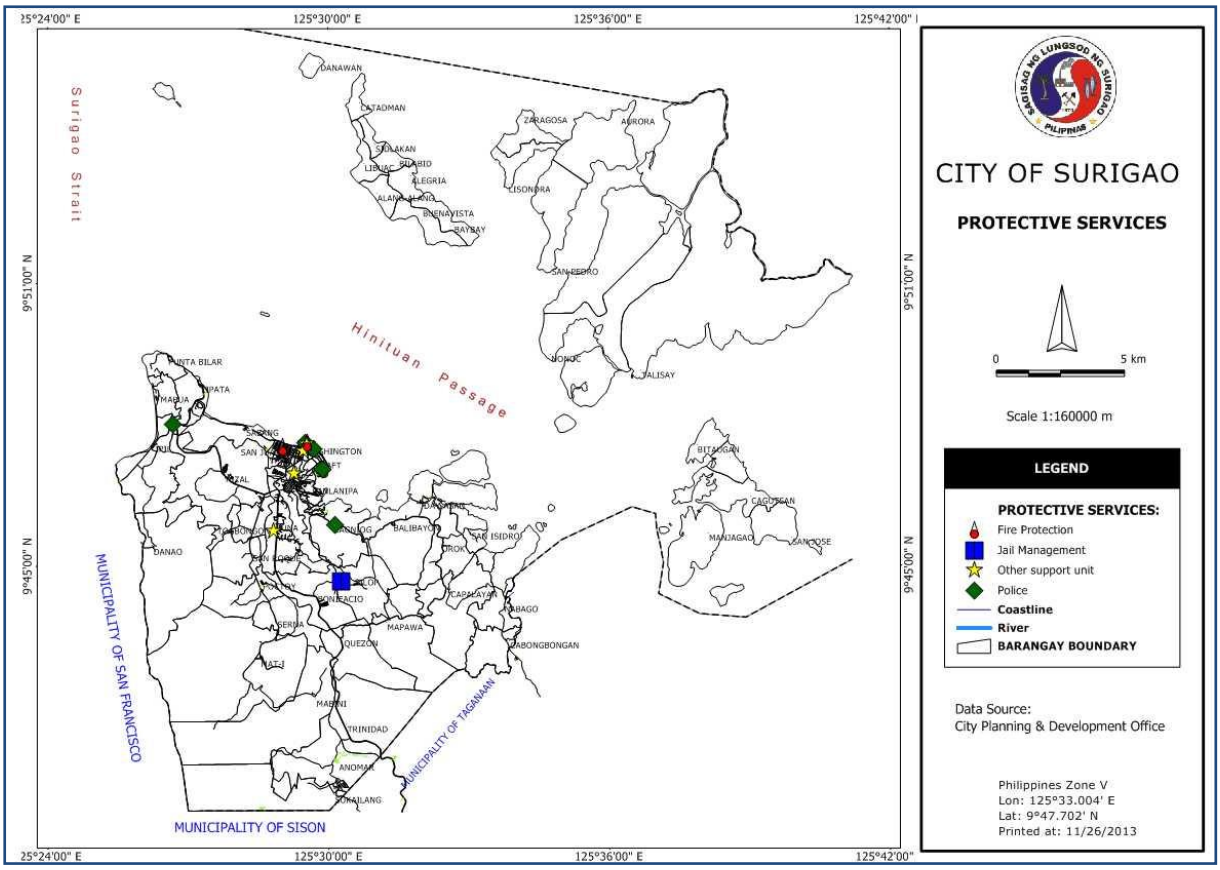
Several major churches can be found in the city. These include the Roman Catholic churches in Barangay Washington, Taft and San Juan; the Iglesia ni Cristo at the landslide-prone area of Bonotan; the United Church of Christ in the Philippines in Washington, among others.

Most of the city's institutional facilities located in the urban and sub-urban zones are considered to be within the flood outlines of the city and are also highly susceptible to liquefaction. Schools located in the urban zones may experience flood depths of up to two (2) meters under 2-year rainfall floods and up to 8 meters under a 5-year rainfall flood, thereby exposing many schoolchildren and students to risk. Several general institutional zones such as the city hall compound in Brgy. Washington, the Surigao Heritage Center and the Boy Scouts Council along the boulevard area, the DENR compound and the Barangay Hall in San Juan may be inundated up to four (4) meters during storm surges. On the other hand, the Provincial Capitol, Surigao del Norte National High School and Iglesia ni Cristo, have a moderate to high susceptibility to rain-induced landslide.



Location of major churches are mostly concentrated in the urban area.

For Special Institutional Zones, the City Jail in Brgy. Bonifacio is moderately susceptible to rain-induced landslide while the Provincial PNP at Brgy. Washington is prone to flooding and highly susceptible to liquefaction, and so are the Police and Fire sub-stations located at Barangay San Juan and Taft. The Central Police and Fire Stations within the city hall compound and so with the PNP Provincial Barracks are considered highly susceptible to storm surges, being near the shoreline.



Location map of protective service facilities in the city.

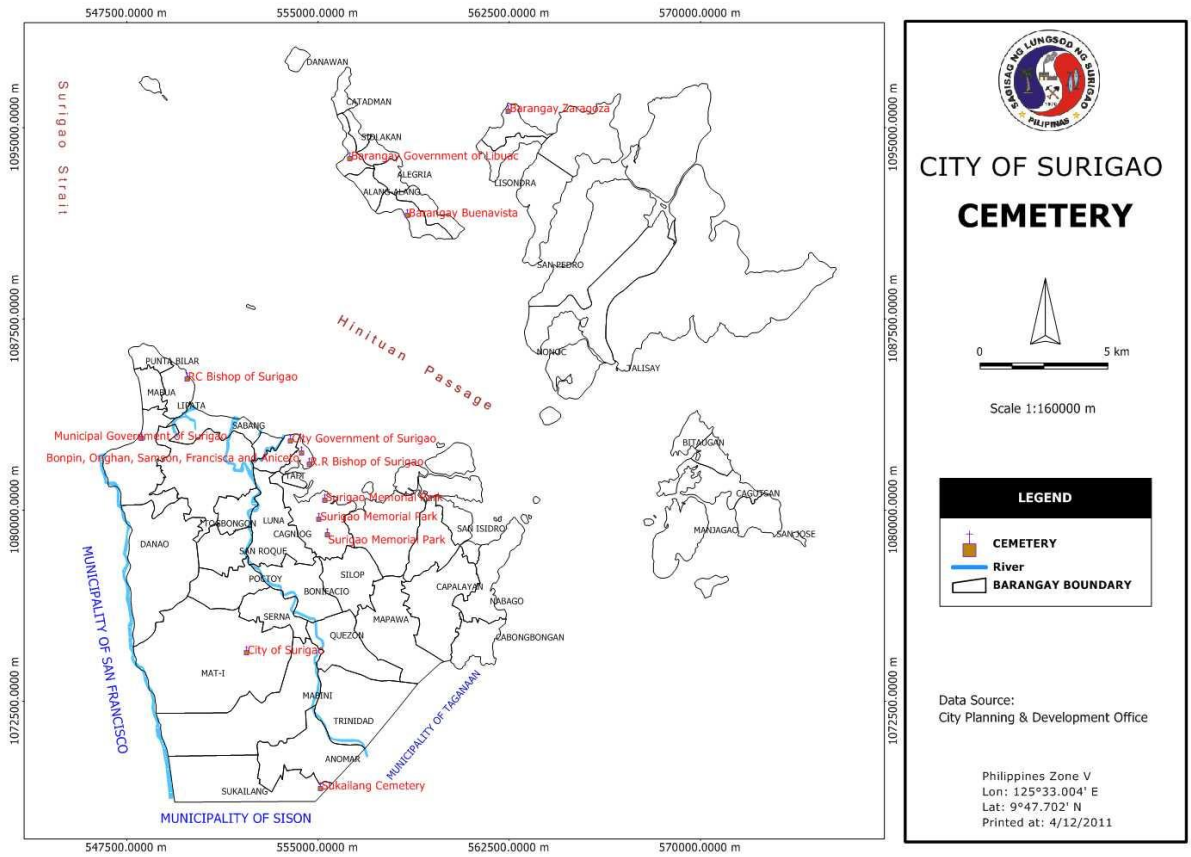
4.3.5 Parks, Playgrounds and other Recreational Facilities

An inventory of sports and recreational facilities reflect a total land area of 9.2 hectares, however, based on GIS data, the existing land area amounts to 5.41 hectares. Several of these facilities are located within school and government premises, such as multipurpose covered courts and playgrounds, hence, they are considered under the Institutional category.

Among the major recreational facilities are the City Luneta park and the Senator Barbers Sports Complex, which are located in the very heart of the city. Both facilities are prone to flooding and liquefaction.

4.3.6 Cemeteries/Memorial Parks

The cemeteries declared in the city Assessor's Office have a combined area of about 11 hectares more or less. The old public cemetery located in Barangay Washington, which occupies almost two (2) hectares is the only one centrally located within the urban area that caters to the general public. The Surigao Memorial Park, on the other hand has an area of more than eight (8) hectares. Both are moderately susceptible to rain-induced landslides.



4.3.7 Infrastructure

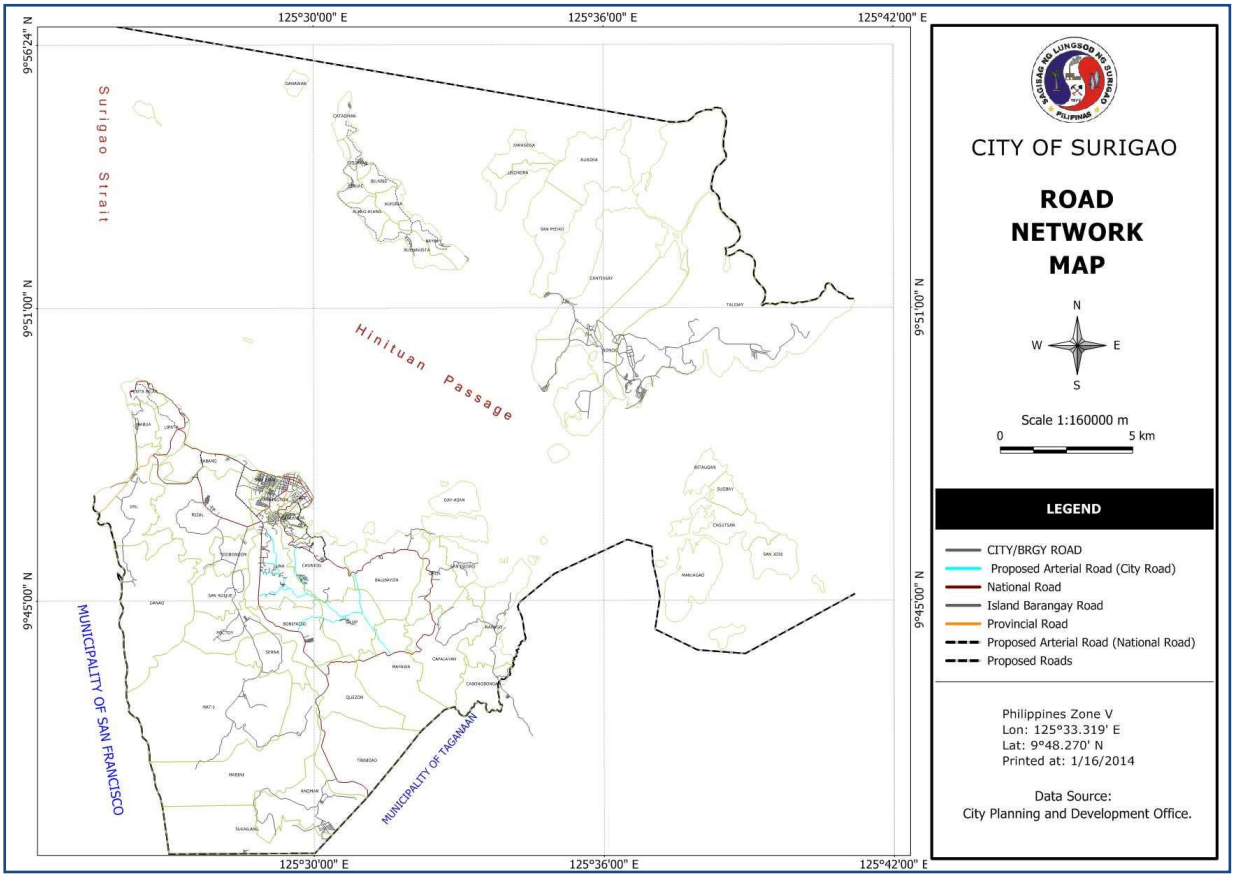
It was in 1954 that the municipal building was completed and likewise the airport was developed along with the improvement of other transportation facilities such as roads and few concrete bridges in the mainland Surigao City. In August 31, 1970, Surigao became a city with 53 barangays in composition - 21 island and 32 mainland barangays. Total population was 51,496 and in 1974 and accordingly several barangay roads were constructed with a total length of 99.852 kilometers.

Several new seawalls and seaports were constructed and more barangay water systems were put in place and the turn-around pad and stop way of the Surigao City airport and Lipata Ferry Terminal were likewise completed. Barangay shore protection facilities, construction of farm-to-market-roads continued and the development of the boulevard was started. The construction of the City Integrated Bus and Jeepney Terminal followed in 1997 and urban coastal reclamation and shore protection works were likewise completed together with the expansion of the Surigao Base Port. Local FM station was expanded and cellular backbone towers were constructed to mainly serve the mainland and island barangays.

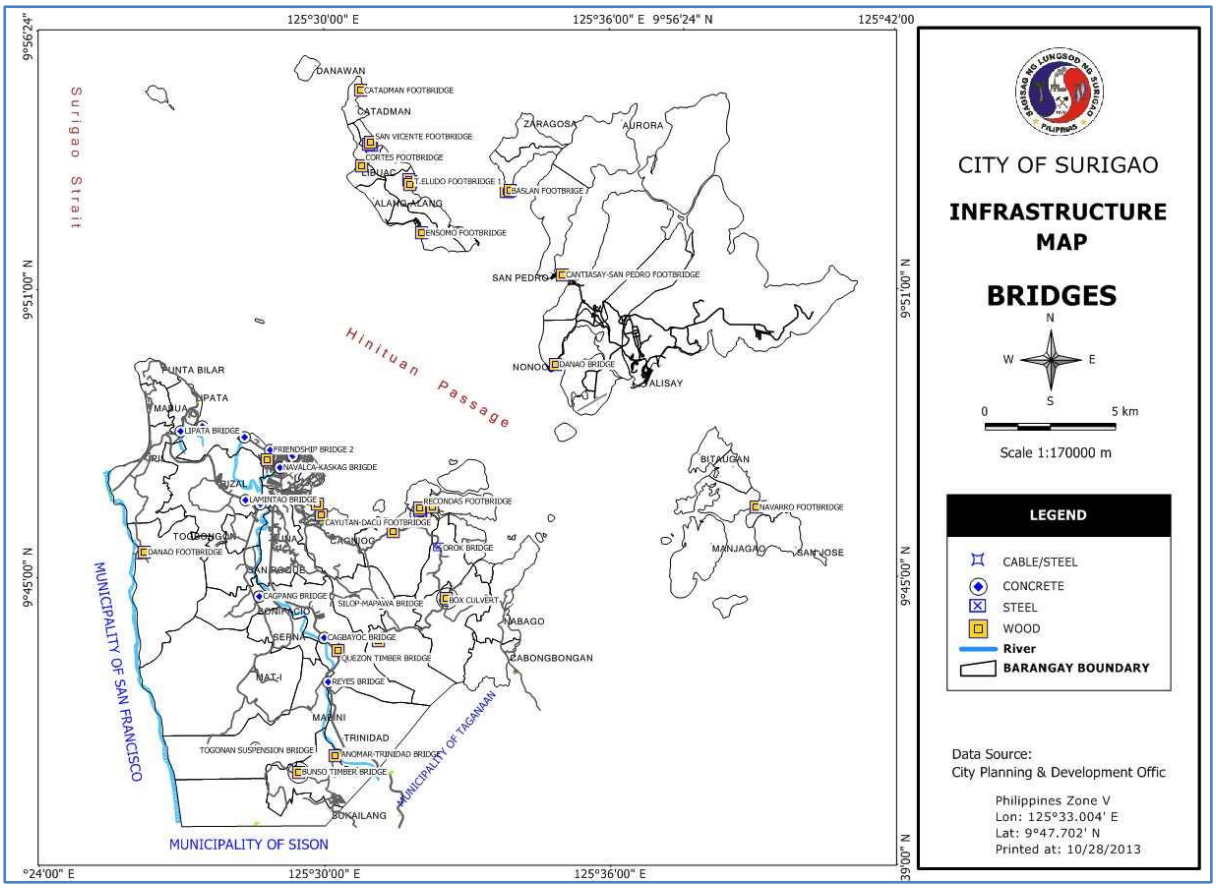
The established road network in the Central Business District's commercial vicinities, institutional areas and residential districts contain bigger areas utilizing the main thoroughfares for transport services. Urban paved roads constitute the highest in areas serving the five (5) urban barangays namely; Canlanipa, Luna, San Juan, Taft and Washington. The sub-urban road links include the main access across a barangay/poblacion with shorter road networks, e.g. subdivisions and barangay sites. Sub- urban barangays include Cagniog, Ipil, Lipata, Mabua, Punta Bilar, Rizal Sabang and Togbongon.

The airport runway occupies an area of 7.6 hectares while 5.0 hectares is occupied by the two ports of Surigao City: the Surigao Base Port and Lipata Ferry Port. These are the primary areas serving the sea and air transport requirements of the city. The City Waste Treatment Facility located at barangay Cagniog has an area of 10 hectares with subdivided waste disposal cells as garbage depositories. Urban and sub-urban roads total to 166 hectares.

Mainland rural road network has a total of 125 hectares linking the existing lateral farm – to – market (FMR) roads having twenty (20) barangays. Arellano district barangays include Balibayon, Silop, Cabongbongan, Capalayan, Day-asan, Mapawa, Nabago, Orok and San Isidro while barangays along the national highway are Bonifacio, Quezon, Trinidad and Anomar. Centrally located areas consist of Danao, Mabini, Mat-I, Poctoy, San Roque, Serna and Sukailang.



Road network map in both the city mainland and island barangays.



Infrastructure map showing the location of existing bridges by type.

Rural island has a total of twenty eight (28) hectares mostly located in Nonoc island constructed before and during the operation of PHILNICO and inclusive herein are the areas of airstrip in Nonoc and a big concrete pier while the small barangay sites have least road system areas given that circumferential road constructions are still to be put in place in the plan period. Road network and utilities actual land use has a total of 319 hectares.

4.3.8 Other Uses

The other existing land uses in the urban and suburban areas include tourism zones located mostly in the coastal areas of Brgys. Sabang, Lipata, Punta Bilar, Mabua and Ipil. Conservation areas consisting of mangrove swamps and other inundated inland areas, some of which are used for fishponds are found within the vicinity of Brgys. Sabang, Lipata and Rizal. Agricultural land uses are also existing in some suburban areas especially those alluvial plain beside the banks of the Surigao River.

4.4 General Land Use/Areas outside of the Current Urban Area

4.4.1 Built-up Areas

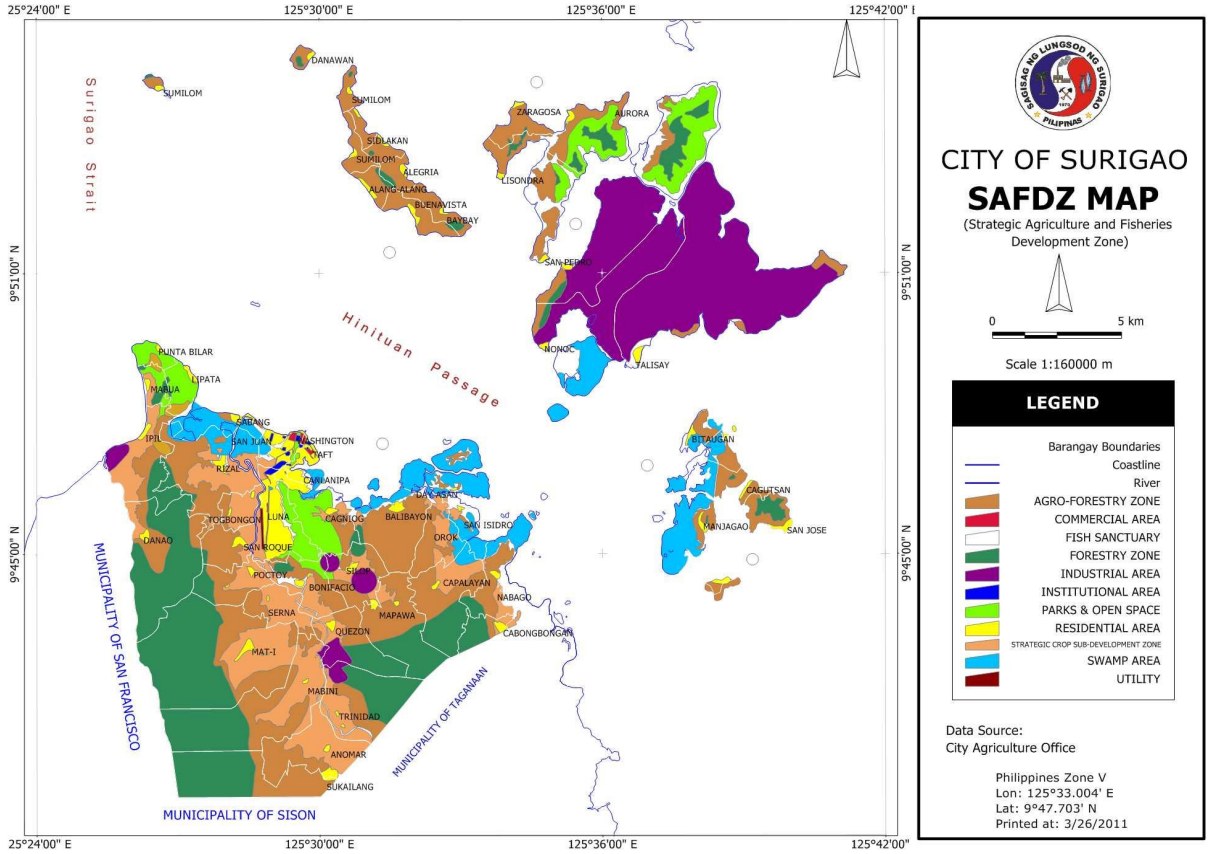
Outside of the present urban and suburban area covering eight (8) barangays, built-up areas are mostly lumped together within the *poblacion* of rural barangays in the mainland and those in the islands. Through the years, due to its small size, a mixed use micro-concentric type of development has prevailed. The typical utilization common to rural and island barangays is predominantly residential, with some institutional uses concentrated in the schools sites and/or the barangay hall and multi-purpose center. There are practically no specific delineated zones to speak of in the built-up portions of the rural barangays except for the generally categorized agricultural lands, forest, industrial lands for those with mining concessions, grass lands and some with tourism zones especially the beaches along the coast.

The problem with this level of land use management in the rural areas is the sometimes unregulated construction of structures, mostly residential units, resulting to undesirable or conflicting land use. As in most cases, building construction and other related infrastructure development in the rural areas that do not bother to go through the process of securing pertinent permits resulted to encroachment of areas not intended for its purpose like encroaching farm lands, coastal or river buffer zones, forested areas, critical slopes and the like. In the long run, although serious damage to the environment may not necessarily result due to the relatively small size and slow pace of these developments, it would still put a strain in terms of the provision of infrastructure support like roads, and the provision of utilities for water and power connections.

4.4.2 Production Land Use

4.4.2.1 Agricultural Areas

Production areas, particularly the prime agricultural lands and productive crop lands in the south central barangays of Rizal-Togbongon to Mat-I; the adjoining areas of Danao-Ipil;, the barangays along the main highway from Bonifacio to Trinidad;,the east central barangays of Silop and Mapawa; and the Arellano District Barangays of Cagniog to Cabongbongan remain dominantly zoned for prime agricultural purposes and crop lands. Generally the areas belonging to the 0-2% slope that are considered alluvial plains are categorized as prime agricultural lands and should not be converted for other uses especially those areas that are irrigated or with potential for irrigation coverage as determined under the Strategic Agriculture & Fishery Development Zone (SAFDZ).



Strategic Agriculture and Fisheries Development Zone in the City of Surigao.

The strategy is to retain the quality and quantity of present prime agricultural lands for purposes of sustaining local food production. Other crop lands not considered as prime areas may be converted to other uses, especially those in the suburban barangays and bordering on major arterial roads. However, the conversion of agricultural lands has to go through clearances from concerned local and national line agencies in order to assess the most beneficial and economic viability of the land. Conversion of agricultural lands in the city however remains low covering only a total of 4.9 has. in the previous plan period representing only 0.03% of the total agricultural area, and these are mostly for utilization as home lots.

4.4.2.2 Industrial Areas

Industrial land uses occupy a sizable area in the overall physical development strategy of the existing plan. The primary consideration is the existing mineral reservation in the area and/or approved mining claims/permits previously granted. The large portions of these areas can be found in Nonoc Island and the Quezon-Trinidad-Mapawa in the mainland. Areas in Arellano District are also provided for agri/agro-industrial purposes. These agri/agro-industrial areas however remained undeveloped.

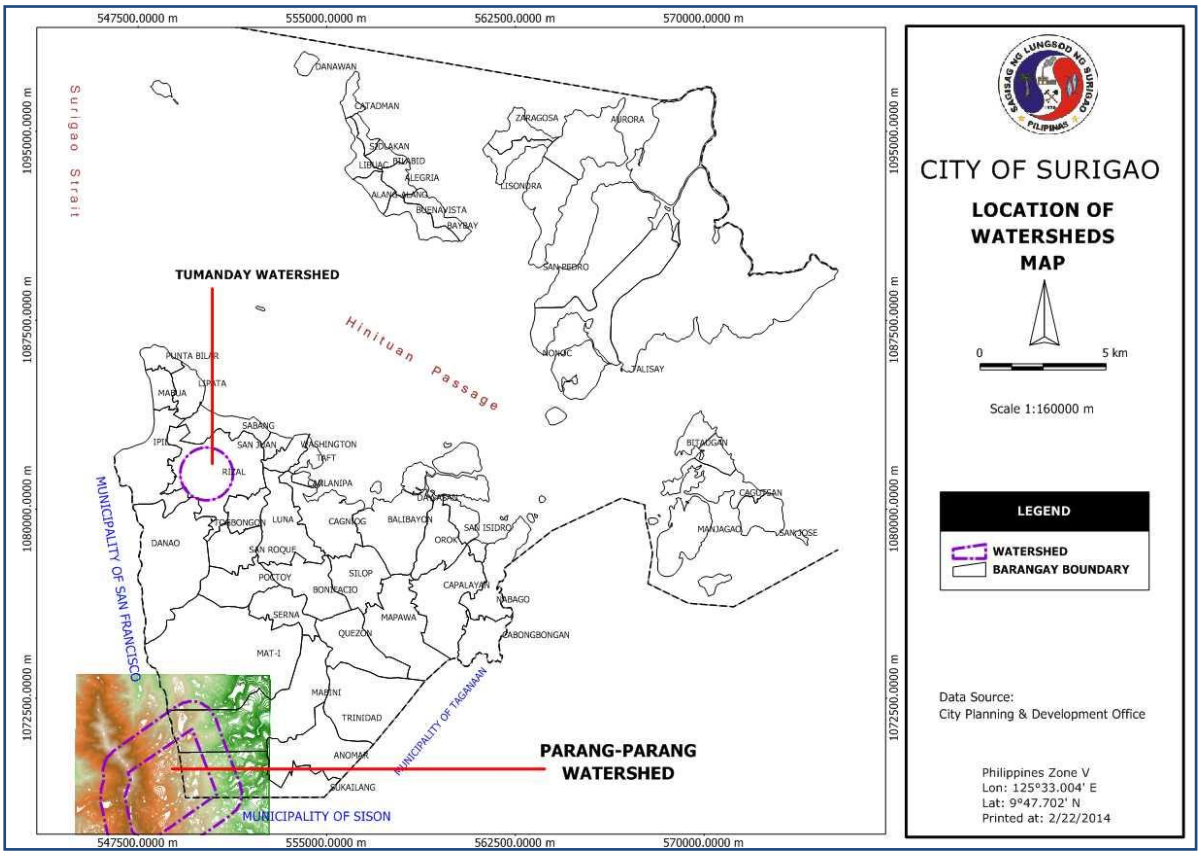
Other areas for light to medium industrial use are also zoned along the suburban areas of Rizal-Togbongon. The strategic direction, except for non-pollutive cottage industries which may be allowed on a case-to-case basis, is to bring out industrial activities away from the CBD and residential communities to the suburban areas. Heavy industrial activities relating to mining and mineral processing shall be confined within its approved permits and with ample provision for the required buffer zones and related environmental management requirements.

4.4.2.3 Production Forest

The adopted strategy for the use of forest lands for production purposes generally is only on the basis of the area's topography and limiting such use for classified forest below 50% slopes. There is however no clear cut integrated plan or approved/on-going major development projects that have been implemented on these areas. Marginal uses have been noted in these areas and these are mostly confined to gathering of firewood for domestic and commercial use.

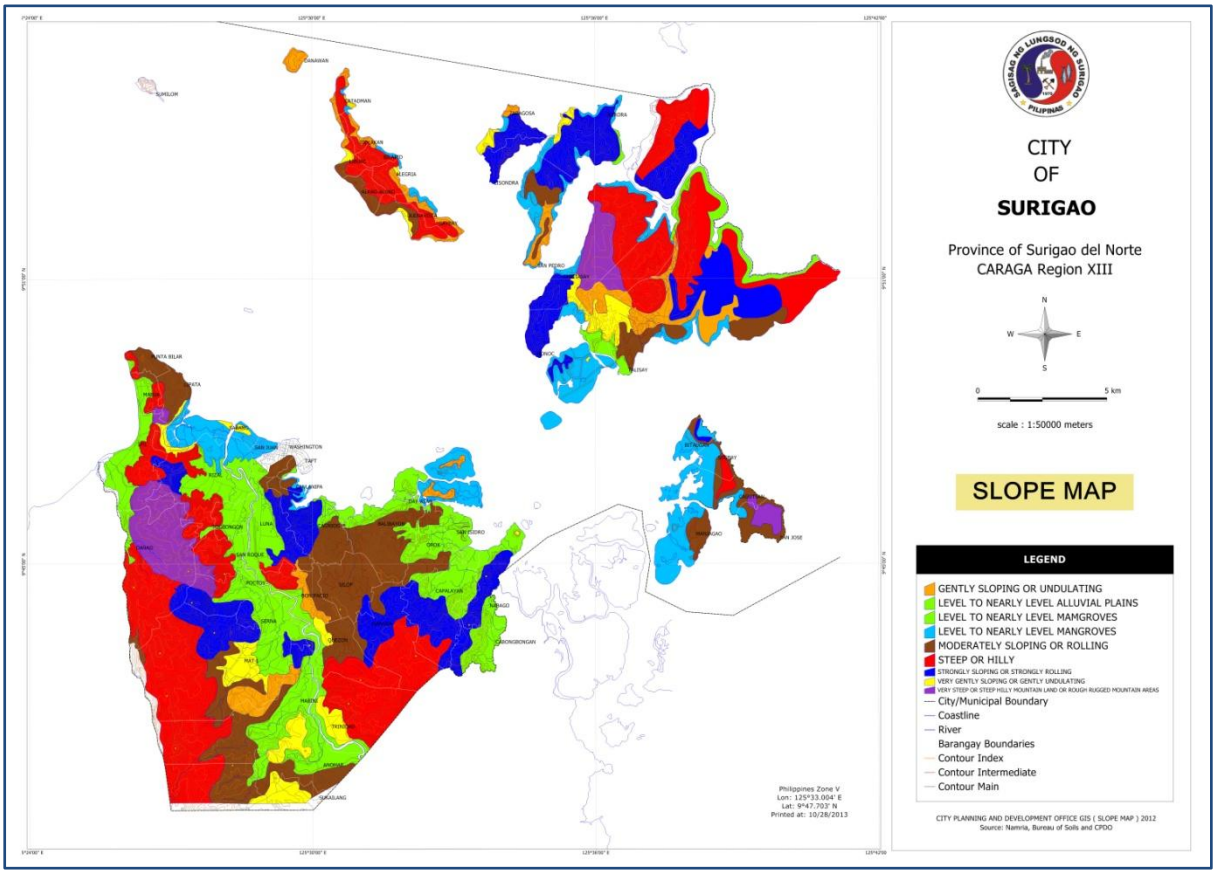
4.4.3 Protection and Conservation Areas

Protected forests which constitute watershed resource reserves located in the uplands of Parang-parang in Mat-i-Mabini area and another one in Sitio Lumaban, Rizal are among the primary areas zoned for protection and preservation, given its past and current utilization as the source of potable water in the urban areas. These are non-negotiable areas where uses shall only be confined to its intended use.



Location map of the Parang-Parang and Lumaban protected watershed areas.

Other conservation areas that are reflected in the current land use with the primary intent of maintaining environmental integrity are inland water bodies, swamps and fishpond areas, mangrove forests and areas with more than 50% slopes.



Slope Map showing the hilly to steep protected/conservation areas in the hinterlands and the mangrove swamps in the coastal and low lying areas.

4.4.4 Ancestral Domain

The Mamanwa Tribe is the only recognized indigenous people's community in the city according to the National Commission of Indigenous People (NCIP). Although widely dispersed across the region occupying the Provinces of Agusan del Norte, Surigao del Norte and Surigao del Sur, the concentration of the Mamanwa Tribe in the city is mostly confined in Sitio Tagbasingan, Brgy. Mat-i and in the adjacent hinterlands. Their ancestral domain stretches across both provinces of Surigao del Norte and Agusan del Norte with a portion of it straddling the upland areas of Brgys. Mat-i and Mabini in the south central area of the city's jurisdiction bordering the Municipality of Sison, Surigao del Norte.

4.4.5 Infrastructure

The primary strategy in the existing land use is to provide greater mobility and access in terms of efficient transportation and circulation network. The need to develop additional roads, especially those that would serve arterial functions to decongest the main and only highway leading to the CBD remains the primary priority. During the plan period however of the current CLUP, only the San Juan-Lipata coastal road was fully completed and the Quezon-Mapawa-Capalayan road. Another critical link is the Bonifacio-Silop-Cagniog road which is already constructed but is not yet fully concreted and narrow; hence, certain portions are unusable during inclement weather, affecting the subject road's efficiency.

The entry of mall developers in Brgy. Luna recently further stressed the need to develop the remaining arterial road network which includes the critical circulation links that would connect the port area to the coast of Canlanipa and Cagniog then to the Arellano District national road.

For the city airport, the planned development is for the extension of the runway in the short to medium term and the eventual transfer or development of a new airport site in the long term. During the plan period however, only the feasibility study for airport development is the one funded and yet to be completed. For seaport development, the main strategy focused on increasing capacity through berth length extension of the base port, increase area for containerized cargo handling and storage, additional RORO ramps at the Lipata Port, and improvement of passenger terminals.

4.4.6 Open Spaces

The strategy adopted for open spaces is more geared on the maintenance and preservation of existing ones and meeting the standard requirements set forth for new housing subdivision development and other planned unit development. The 54 barangays of the city have adequate facilities for sports and recreation, such as multi-purpose halls, covered courts, including open spaces for varied wholesome and healthy outdoor activities. Other facilities like parks & playgrounds, swimming pools, tennis courts, chess plaza, golf & shooting ranges, billiard halls are available in urban and sub-urban zones to cater to the more diverse recreational preferences of the residents in the said areas.

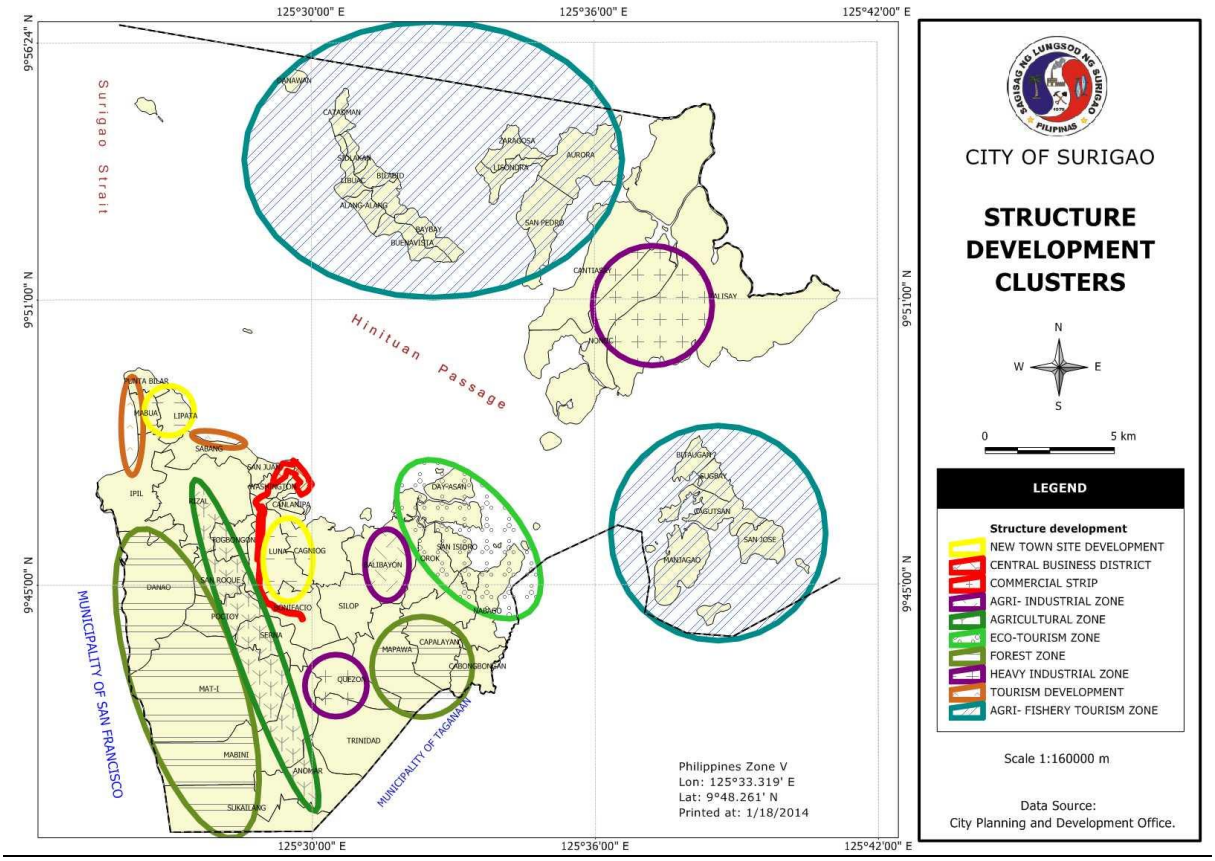
4.5 Proposed Land Use Strategies

4.5.1 Concept/Structure Plan

The general structure development concept of the city presents a combination of the area-focused integrated area development in the rural areas, where barangays have clustered spatial development roles. The area development clusters takes into consideration proximity and distance, commonality of resources, existing economic activities, available natural resources and future trends. This is practically a continuation of the same approach in the preceding CLUP.

The urban core will continue to develop on its three-pronged linear corridor approach and multi-nodal development, but this time with two (2) growth nodes in the form of new townships to anchor and spur development away from the CBD. The concept is to reinforce and connect the linear corridors through the township development projects and create new urban cores. Suburban areas will ultimately absorb the urban expansion for settlements, commerce and other service needs.

Other growth clusters in the mainland include the production zones covering agricultural, forest, industrial and tourism areas. The island clusters are structured on a combined agri-fishery and tourism spatial development roles, and the heavy industrial growth cluster in Nonoc.



The Structure Development Plan showing the spatial development clusters in the city mainland and islands.

4.5.2 Proposed Development Strategy

The herein land use plan generally makes use of three development strategies. ***First*** is of course the ***development of the urban areas*** with emphasis on balancing settlements and commercial development; ***second*** is the ***rural focused integrated area development*** geared towards the development of the production areas like agriculture, tourism and the judicious utilization and/or protection of forest lands; and ***third***, ***industrial development*** to cover mineral-based and agri-based industries.

4.5.2.1 Alternative Urban Forms

For urban development, the focus would remain on the five (5) barangays comprising the urban area and the now nine (9) barangays, from only eight (8) in the previous plan period, comprising the suburban area.

In the previous years prior to having land use regulatory measures in place, the urbanization pattern is more of a ***trend extension*** from the old *poblacion* area resulting to a *dispersed sheet* pattern of development. In the previous plan period more regulatory measures were put in place through the zoning ordinance but still informal settlements continue to sprout along adjacent swampy areas, along river banks and in the coastal/beach areas. This type of physical development should be discouraged or put to a minimum, for it has put a strain on the environment, created vulnerable communities, increased population density in the urban area thus contributing to further congestion, traffic and pollution problems. This type of development has also affected the overall attractiveness of the city due to limited space allocation to address urban blight and may reduce the city's positioning as a gateway for tourism, trade and industry in this part of the region.

To regulate such trend extension, and follow the strategic urbanization that the city intends to accomplish require that new roads and other infrastructure have to be put in place; the need to capacitate communities to adjust to risks and develop resiliency; preservation of protected croplands, conservations areas and other resources; strict enforcement of regulations especially in new planned developments.

A continuation of the ***linear urban form*** bordering on the development of commercial strips and other mixed use development along identified major roads will also be pursued as a strategy to ease up, redirect and regulate urban development outwards from the CBD. To realize this, the aforementioned requirements of new roads and other infrastructure have to be put in place; the need to capacitate communities to adjust to risks and develop resiliency; preservation of protected croplands, conservations areas and other resources; strict enforcement of regulations especially in new planned developments remain the critical ingredients.

Although problems relating to traffic would still persist, including air and noise pollution since development will be concentrated on major road networks. Attractiveness of the city would still not improve unless aesthetics and related policies for structures/buildings along the development corridors will be enforced. The potential for urban expansion away from the *poblacion* will however be realized and remaining open areas like mangrove swamps, fishponds and farm lands will remain untouched. Additional LGU revenues will also be realized from increased land valuation and business activities. The increased trade and commerce brought about by additional areas for investments would support the enhancement of tourism-related services and create prospects for jobs and higher income.

Complementing the development corridors would be the adoption of the ***multi-nodal*** urban form. Such a strategy aims to complement and catalyze further development away from the urban core and the CBD. The decentralization of city-wide services through the establishment of township developments to serve as growth or satellite urban centers would provide greater access and even lesser transportation costs for suburban and rural residents. Pollution sources and waste management can easily be addressed in the designated growth centers and the preservation of open spaces, crop lands and other environmentally constrained areas can be realized. Again additional revenues from increased land valuation can be generated and the prospects of job generation maybe realized with the entry of new investments in the designated new growth centers.

In terms of aesthetics, the overall attractiveness of the city will be enhanced with the retention or preservation of spaces in between growth areas thus allowing enough open areas to break the visual monotony of buildings and other structures. Planned unit developments in these identified growth nodes would also translate to ensuring the mixture of functionality and design, thus greatly contributing to the city's positioning as the tourism gateway.

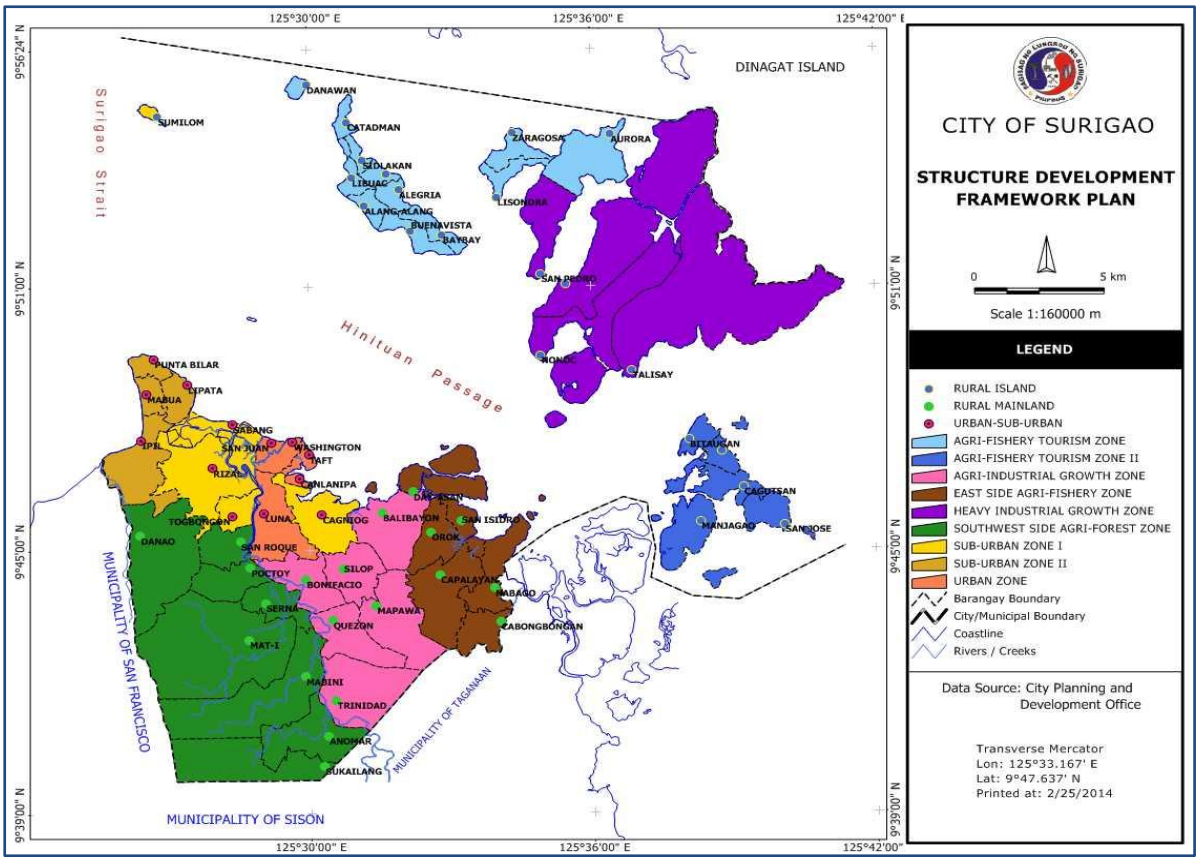
4.5.2.2 Preferred Spatial Strategy

Based on the aforementioned discussions on the preceding section, the comparative analysis of the alternative urban forms shows that the more logical option for the city to undertake is to continue the regulated growth of the development corridors. This is the most preferential action within the short to medium terms as a strategy to ease up the congestion in the urban core. Existing developments in this regard are already on-going however careful attention has to be given on the regulatory aspects of realizing this urban form lest it will defeat whatever strategic gain it will be able to achieve. The necessary infrastructure requirements shall also be equally given impetus so that better circulation links and access can be realized.

In the long term, the development of major growth areas through the establishment of new townships will follow through in order to achieve a multi-nodal development pattern. As it is, the multi-nodal strategy aims to create satellite growth areas or new urban cores that would complement the development corridors. This is the long term growth pattern that would fully enable the establishment of well-planned urban communities and would eventually ease up the congestion in the present CBD. There are also minor growth nodes that are both existing and planned that would continue to play its catalytic role of extending the existing growth corridors. Primary among these is the integrated land transport terminal and city airport in Brgy. Luna; the Lipata Ferry Terminal and Maharlika Resort in Brgy. Lipata; the yet to be developed agri-industrial estate in Brgy. Balibayon and the planned transfer of PACEMCO Industrial Port in Brgy. Cagniog.

Specific spatial development clusters are also planned in the suburban areas, the rural mainland and in the islands, so that the development directions and spatial development role of every barangay are clearly defined. This will in essence translate the three (3) proposed development strategies into more specific details and actions.

Thus, hereunder are the following spatial development clusters, viz:



Spatial development clusters/zones showing the city barangays' spatial development roles.

A. Urban Development

Urban Zone

The emphasis for the urban core, especially the present CBD is for the in-filling of existing vacant lots that are fit for development. Existing commercial corridors shall be further enhanced with emphasis on redirecting urbanization towards the suburban areas. Densification and expansion of the existing CBD shall also be pursued where former residential areas adjacent to the CBD shall now be zoned for commercial purposes or permitted mixed uses. Densification will also be adopted especially promoting vertical expansion of high to mid-rise structures to allow greater space utilization provided that ample on-site parking spaces and road setbacks will be duly enforced. Vertical expansion especially for areas along the coast and beside river banks that is vulnerable to flooding and storm surges will allow ground floor areas to simultaneously function as storm/flood buffers and preventing casualties during disaster situations.

The following are the general urban area development clusters:

- Washington (CBD, mixed use commercial-institutional-residential zone)
- Taft (CBD, mixed use commercial-institutional zone)
- San Juan (mixed use commercial-institutional zone)
- Luna (primary urban expansion area/commercial strip development, mixed use commercial-institutional-resdiential zone, new township development)
- Canlanipa (mixed use residential zone, settlements expansion area, port facility development in the coastal area)

Suburban Area

The suburban area will function as the primary urban expansion area which will cater to commercial, residential, institutional and light to medium industrial requirements. Again, there will be a continuation of development of commercial corridors or strips along national roads of Luna extending to Bonifacio; and an additional one of Luna to Rizal area. The development of two (2) new townships to focus on mixed use planned unit development in the suburban areas of Lipata-Punta Bilar-Mabua and Luna-Cagniog-Silop areas will also be pursued.

Production areas like prime agricultural lands and fishponds will be retained to function as such not only for their role in food production but likewise in view of their function as natural catch basins. Only marginal crop lands shall be allocated for purposes of conversion to urban expansion. Likewise, conservation areas and other protected zones including coastal and river bank buffer zones shall also be preserved and those currently encroached shall be restored.

Generally, these are the area development roles

- Sabang (settlements expansion area, production-inland fisheries, tourism)
- Lipata, Punta Bilar, Mabua, Ipil (new township development, tourism)
- Rizal, Togbongon (settlements expansion area, commercial strip development)
- Bonifacio (settlements expansion area, commercial strip development)
- Cagniog (settlements expansion area, agri-industrial development)

B. Rural-Focused or Integrated Area Development

The second proposed development strategy for the city is focused on rural development with emphasis on maintaining and developing further its production areas for agriculture, fisheries, forestry and tourism.

Agricultural

The following areas shall remain to function in accordance with their roles in the city's Strategic Agriculture and Fisheries Development Zones (SAFDZ) as the primary implementing mechanism for the city's agriculture and fisheries modernization plan. Primarily, the following identified spatial development clusters is a continuation of the same development strategy in the previous plan period. As such, it seeks to maintain and preserve the functional role of these production areas, viz:

- Crop lands, both primary and for high-value crops development including coconut lands: south-central barangays with Poctoy to provide the agri-processing support (Togbongon to Mat-I; Mabini and Danao; Rizal and Ipil Areas)
- Crop lands, both primary and for high-value crops development including coconut lands: barangays along the Surigao-Agusan Road with Trinidad to provide the agri-processing support (Bonifacio to Trinidad, Anomar and Sukailang areas)
- Crop lands, both primary and for high-value crops development including coconut lands, coastal resource and fisheries development with Canlanipa to provide fishery services support and Cagniog-Balibayon for agri-processing: east-central barangays (Silop, Cagniog to Cabongbongan, Mapawa)

- Coconut lands, grass and pasture lands and areas for high-value crops development, coastal resource and fisheries development: Island clusters of Hikdop Island, Sibale Island, Bayagnan Island

Tourism

The city's vast array of natural scenic spots both in the mainland and islands shall provide the impetus for its drive towards tourism development, as a rural support component of related facilities and services in the urban area and suburban areas, and even mining-related industrial activities. The clusters would cover the following areas and barangays, viz:

- Urban support services and facilities (all urban barangays)
- Rest & recreation zone with mixed use commercial development (Sabang, Lipata, Punta Bilar, Mabua to Ipil coastline)
- Eco-Tourism
  - mangrove forest zones and coastline of Brgys. Day-asan, Nabago, San Isidro up to Cabongbongan, Manjagao area in the islands
  - Island clusters of Hikdop Island, Sibale Island, Bayagnan Island
  - forest zones of Sukailang, Mat-i and Mabini areas (including heritage sites of indigenous peoples' communities)
  - cave systems of Silop and Mapawa, Buenavista in the islands
  - dive sites in various coastal and island sites with Punta Bilar as the primary service center
- Industrial Tourism
  - Nonoc Island with Talisay as primary service center; mainland cluster of Bonifacio, Quezon, Trinidad and Mapawa

Forest

Forest lands and other forest categories shall be primarily protected especially those areas designated and identified as watersheds or sources of potable water supply. Areas generally classified as having slopes of more than 50% shall also be zoned as protected forests, including coastal mangrove areas and swamplands.

Certain areas that are classified as forest lands shall be used for production purposes, provided that the subject utilization shall be in accordance with its basic nature as primary buffer areas for the protected zones and shall not in any manner endanger or cause potential damage to the protected forests. Thus, areas with slopes of between 30% to 50% maybe utilized in a limited manner for production purposes like development of orchards, tree plantations and the like as long as emphasis is given on the nature of its environmental protection function. In the same manner, swamplands and other inland water bodies may also be utilized for inland fisheries production provided that due diligence is given on maintaining ecological balance.

The forest clusters are the following, viz:

- Protected forests: southeast side hinterland high elevation areas of Mat-I, Mabini, Sukailang and Danao, including the location of the proclaimed watershed in Parang-Parang and the adjoining areas; Sitio Lumaban in Brgy. Rizal which is also the current alternative source of potable water for the city and proposed for proclamation

- Production forests: southwest hinterland high elevation areas of Mapawa, Trinidad, Anomar, Sukailang, Cabongbongan, Capalayan; Rizal and Ipil ridges
- Conservation areas/swamplands in Sabang, Rizal and Lipata; mangrove forest zones and coastline of Brgys. Day-asan, Nabago, San Isidro up to Cabongbongan; Manjagao area in the islands

C. Industrial Development

The third spatial strategy and equally important to support the city's development vision to attain economic dynamism is the push for industrial development. The development will of course be anchored on the proclaimed Surigao Mineral Reservation area and the site of existing and planned mineral processing industries, including the 106 has. proclaimed Special Economic Zone.

Complementing the mineral-based processing industries are sites or growth nodes in the mainland that would spur and support the development of agri/agro-processing industries, and other sites to support light to medium industrial land requirement supportive of urban development.

These are the industrial growth clusters, viz:

- Heavy Industrial: Nonoc island and Hanigad Island, existing mining concessions and proclaimed mineral reservation areas; south mainland (Bonifacio, Quezon, Mapawa, Trinidad)
- Agri/Agro-Industrial: Cagniog and Balibayon; Canlanipa for fish/marine products processing
- Light to Medium Industrial: Luna, Rizal-Togbongon areas

4.5.3 Land Demand and Supply

The following table shows the determination of the current land supply and uses, the future requirements consisting of the projected demand based on population or land use planning standard and the strategic requirements to support the city's attainment of its development vision and goals.

Both the current land use and future requirements serve as the primary basis in the determination of the total area requirement and consequently, the proposed land uses.

LAND USE CATEGORIES *(all figures are in hectares)*	**CURRENT LAND USE**			**FUTURE NEED**			**TOTAL LAND USE REQUIRE-MENT** (A + B)
	Existing	**Backlog (Surplus)**	**Total** (A)	**Projected Requirements**	**Strategic Dev't. Requirements**	**Total** (B)	
Residential	381.00	135.00	516.00	165.00	82.10	247.10	**763.10**
Commercial	37.00	34.92	71.92	78.47	26.09	104.56	**176.48**
Infrastructure/Utilities	319.00		319.00		325.00	325.00	**644.30**
Institutional	65.43		65.43	2.00		2.00	**67.43**
Parks/Playground and other Recreational Spaces	5.41		5.41		11.59	11.59	**17.00**
Industrial	4,074.87		4,074.87				**4,074.87**
Built up area	558.10		558.10		377.00	935.10	**935.10**
Agriculture	13,688.14		13,688.14				**13,688.14**
- Rice and Corn Land	3,159.40						**3,159.40**
- Cocoland	10,309.46						**10,309.46**
- Cropland	219.28						**219.28**
Forest and Forest Categories							
- Protected Forest	1,790.17		1,790.17				**1,790.17**
- Production Forest	886.0		886.0		3,604.00	4,490.00	**4,490.00**
- Grassland/ Pasture	1,600.86		1,600.86			1,600.86	**1,600.86**
Agro-Industrial	0.37		0.37		166.63	166.63	**167.00**
Tourism	25.50		25.50		60.50	60.50	**86.00**
OTHER USES							
Cemetery/Mem. Park	11.00		11.00		14.70	14.70	**25.70**

LAND USE CATEGORIES *(all figures are in hectares)*	CURRENT LAND USE			FUTURE NEED			TOTAL LAND USE REQUIRE-MENT (A + B)
	Existing	**Backlog (Surplus)**	**Total** (A)	**Projected Requirements**	**Strategic Dev't. Requirements**	**Total** (B)	
Dumpsites/Sanitary Landfill	14.00		14.00				**14.00**
Buffer Zones/ Easements	28.00		28.00		14.00	14.00	**42.00**
Conservation Area	113.33		113.33		14.67	14.67	**128.00**
Risk/Hazard Area					8.84	8.84	**8.84**
Water Uses							
- Nipa, Swamps, mangroves	2,747.40		2,747.40		75.10	75.10	**2,822.50**
- Bodies of water (rivers & tributaries)	145.20		145.20			145.20	**145.20**
- Aquaculture and Mariculture	325.77		325.77		325.77	325.77	**325.77**
Total	**26,816.55**	**169.92**	**26,986.47**	**245.47**	**5,105.99**	**5,351.46**	**32,337.93**

As of year 2010, the current land use which covers actual uses of more than 26,000 hectares and the backlogs in residential and commercial allocation of 169 hectares totaled 26,986.47 hectares. This is more or less equal to the city's geographic information system (GIS)-generated total land area at almost 27,000 hectares. Although the official (NSCB) recorded land area of the city is 24,534 hectares, the current working maps would total to more or less 27,000 hectares.

Taking into consideration the future requirements due to population increase and/or meeting the standard planning area requirements, plus the strategic development initiatives intended to spur future economic growth, total land uses for the planning period would reach a total of 32,337.93 hectares. The huge disparity in the city's total land area by about 5,000 hectares versus this area requirement can be attributed to certain areas like coastal mangrove forests, mariculture farms and the like being not included in the total land area of the city. Moreover, other strategic development requirements in infrastructure like ports will take on reclamation works, as well as the proposed boulevard extension and real estate development project in Brgys. Washington and San Juan. To meet the other area requirements, considering that the city's land area will no longer increase laterally, corresponding strategies has to be adopted which among others would include the need for vertical expansion or densification of certain areas to meet residential, commercial and institutional requirements.

CHAPTER 5
Proposed Land Uses

5.1 Urban Land Uses

5.1.1 Residential Land Use

The present requirement for residential area is computed based on the total housing backlog of the city, which is 13,526 units. Housing backlog is due to doubling of households, displaced units, and need for Security of Tenure. The latter covers housing needs for households that are occupying private and government properties and for those living in danger zones. This applies mainly to urban and suburban zones. To address this present backlog, an additional of 135 hectares is presently required, placing the city's total area requirement for dwelling at 516 (381+135) hectares.

Within the 10-year planning period until 2020, a total expanse of 763.1 hectares is proposed for the residential zones. This will already take in consideration the existing housing backlog of 135 hectares and future requirements of 165 hectares and strategic development requirements of 82.10 hectares for the establishment of additional subdivisions and other socialized housing projects to address population growth, doubled-up households and the proliferation of informal settlers due to unregulated urban sprawl. Resettlement sites particularly in Sitio Bioborjan, Barangays Rizal, Cagniog and Balibayon will inevitably be developed to cater to displaced families during the future clearing of structures in areas considered unsuitable for settlement. Mitigation measures should also be undertaken to protect areas which are identified as vulnerable to hazards. Moreover, portions of previously categorized open zones particularly those located in Barangay Luna and Rizal will be reclassified as residential areas.

The proposed establishment of a new townsite in Barangays Lipata, Luna, and Cagniog, as well as the creation of new barangay sites and expansion of residential areas would likewise increase future requirement for built-up areas particularly in rural mainland and island barangays.

Such is deemed essential to attain the goal for the sector of providing decent and environmentally sound shelter and addressing the present and projected housing backlog.

5.1.2 Commercial Land Use

The city's trend of urbanization or commercialization is expected to occur east, west and south of the present urban area. The city's existing urban core of Luna, Washington, Taft, San Juan and Canlanipa will remain with the city's central business district concentrated in Taft and Washington expanding to cover mixed use residential areas in the urban core. Commercial strip development will occur along the national highway in Washington-Luna-Bonifacio area, Luna-Rizal highway and mixed use development along San Juan-Sabang-Lipata coastal road with preference on tourism-related activities in Sabang-Lipata areas. The city boulevard will be fully developed into a hub for business and commercial activities. The city's existing port facility has been enhanced to cater to larger vessel and shipment volume. Commercial and industrial activities are also moving in Brgy. Luna-Bonifacio-Quezon area. This area is envisioned as an industrial center for light and medium industries covering the Brgys. of Trinidad, Sukailang, Anomar, Mapawa, Bonifacio and Silop areas.

Based on the standard commercial space requirement, the city's backlog for year 2010 is about 34.92 hectares compared against the standard requirement of 71.92 hectares. Starting year

2011, the standard commercial space requirement is around 72.73 hectares and about 80.55 hectares in the year 2020. With the existing commercial land use of 37.0 hectares, a total of 104.56 hectares commercial space in urban and sub-urban zones were required to meet present and future demand at the end of the planning period 2020. This is based on an existing backlog of 34.92 hectares, projected demand of 43.55 hectares and a strategic development initiative of about 26.09 hectares.

Standard and Projected Commercial Space Requirement
2011-2020

2005 Existing Commercial Area (has.)	Standard Commercial Area Ratio (%)	Projected Increase of Built-up Area		Standard Commercial Space Requirement (has.)	Projected Commercial Space Requirement (has.)	
		Year	Area (has.)		Accumulated	Per Year
37.0	3% of the total built-up area	2011	2,424.52	72.73	35.73	35.73
		2012	2,452.16	73.56	36.56	0.83
		2013	2,480.11	74.40	37.40	0.84
		2014	2,508.38	75.25	38.25	0.85
		2015	2,536.97	76.10	39.10	0.85
		2016	2,565.90	76.98	39.98	0.88
		2017	2,595.15	77.85	40.85	0.87
		2018	2,624.74	78.74	41.74	0.89
		2019	2,654.66	79.64	42.64	0.90
		2020	2,684.92	80.55	43.55	0.91
SUB-TOTAL						43.55
ADD 2010 CURRENT NEED						34.92
ADD PLANNED UNIT DEVELOPMENT						26.09
GRAND TOTAL						104.56

The following areas are identified for future urban and sub-urban expansion and/or new sites for commercial development:

1. Commercial strips at Brgys. Washington-Luna-Bonifacio and Luna-Rizal along the national highway
2. Commercial strip along Rizal-Togbongon Road for warehousing and light industries
3. Commercial area within the proposed Fishing Port Complex at Brgy. Canlanipa
4. Commercial service center at the Phase 2 Development of the City Boulevard at Brgy. Washington
5. West Coast Business Park Development Project for reclamation at the foreshore of Brgy. San Juan
6. Commercial area within the proposed Metro Surigao Agri-Industrial Estate at Brgy. Balibayon
7. Commercial service centers at Brgys. Nonoc and Talisay to support the industrial activities of the Nonoc Special Economic Zone and PHILNICO Nickel Refinery
8. New Township Development at Brgys. Lipata-Punta Bilar-Mabua area; Brgys. Luna-Cagniog-Bonifacio-Silop area

With regards to the susceptibility of the proposed commercial developments particularly to flooding, the commercial strips at Brgys. Luna and Bonifacio are low to moderately susceptible to

two-year flooding and highly susceptible to five-year flooding since these areas are adjacent to the Surigao River which is experiencing perennial flooding. With this scenario, mitigating measures shall be introduced prior to any development within these commercial strips, particularly in-filling activities to raise present elevation preferably to match or better above the present level of the national highway, and complemented by efficient drainage system. The same problem faces the proposed commercial strip along Brgy. Togbongon but the in-filling in this area should be no less than a meter higher than the present road elevation.

The proposed commercial development in Brgys. Nonoc, Talisay, Lipata and Balibayon are not affected of the two-year and five-year flooding scenario. However, Brgys. Nonoc and Talisay are highly susceptible to tsunami hazards, but no historical accounts have so far been recorded. Meanwhile, the proposed development at Brgys. Taft, Canlanipa, Washington, Sabang and San Juan are highly susceptible to five-year flooding scenario. In this case, there is a need for similar mitigating measures prior to any development in these areas.

5.1.3 Industrial Land Use

Based on the combined industrial land intensity standards (about 7.3 hectares for every 1,000 population), the city's total allowable industrial land requirement by year 2010 is about 1,009.06 for a population of 138,228. However, the city's existing industrial land use totaled to 4,074.87 hectares. This means that the city's existing industrial land use has exceeded the standard requirement of about 3,065.81 hectares per 1,000 population. However, this is of no surprise since most of the city's industrial areas are located within an identified heavy industrial growth zone and/or mineral reservation area particularly in the rural islands. The projection by year 2020 requires only a total of 1,172.22 hectares industrial land use per 1,000 population, with which the 2010 existing industrial land use still exceeded the standard requirement of about 2,902.65 hectares.

Based on the standard and projected industrial space requirement, the city no longer needs industrial space to meet present and future demand at the end of the planning period 2020.

Projected Allowable Industrial Land Area Requirement
2011-2020

Year	Projected Population	Standard Industrial Land Intensity (in has./1000 population	Projected Allowable Industrial Area Requirement (has.)
2011	140,316		1,024.31
2012	142,434		1,039.77
2013	144,585		1,055.47
2014	146,768		1,071.41
2015	148,984	7.30	1,087.58
2016	151,234		1,104.01
2017	153,518		1,120.68
2018	155,836		1,137.61
2019	158,189		1,514.78
2020	160,578		1,172.22

Given the above, the following existing and proposed projects will be developed, viz:

1. Development and operations of the Special Economic Zone for heavy industries in Nonoc Island anchored on the re-operation of the Nickel Refinery
2. Medium to Heavy Industrial Zone development in Bonifacio-Quezon-Mapawa-Trinidad anchored on the operations and expansion of Pacific Cement Phils., Inc.
3. Development of Light to Medium Industrial Zone along Togbongon-Rizal Junction
4. Development of Light to Medium Industrial Estate in Brgy. Balibayon
5. Development of Agri-Industrial Estate at Brgy. Cagniog

With regards to the impacts of various hazard elements to these identified industrial development areas, the development of light and medium industries within the junction of Brgys. Togbongon and Rizal are moderately susceptible to two-year flooding, but highly susceptible to five-year flooding scenarios. These barangays are also prone to liquefaction. In this case, there is a need for mitigating measures prior to any development in the area.

Meanwhile, the proposed development of Special Economic Zone at Nonoc Island is far from the effects of two-year and/or five-year flooding. However, this Island is highly susceptible to liquefaction, storm surge, tsunami and rain induced landslides.

The area proposed for agri-industrial estate development at Brgy. Balibayon is susceptible to two-year and five-year flooding; liquefaction, storm surge and tsunami.

The areas in Brgys. Quezon and Trinidad for the operation of the Pacific Cement Philippines, Inc. are still susceptible to flooding, highly susceptible to liquefaction, and low to high susceptible to rain induced and earthquake induced landslides in some hilly and sloping areas.

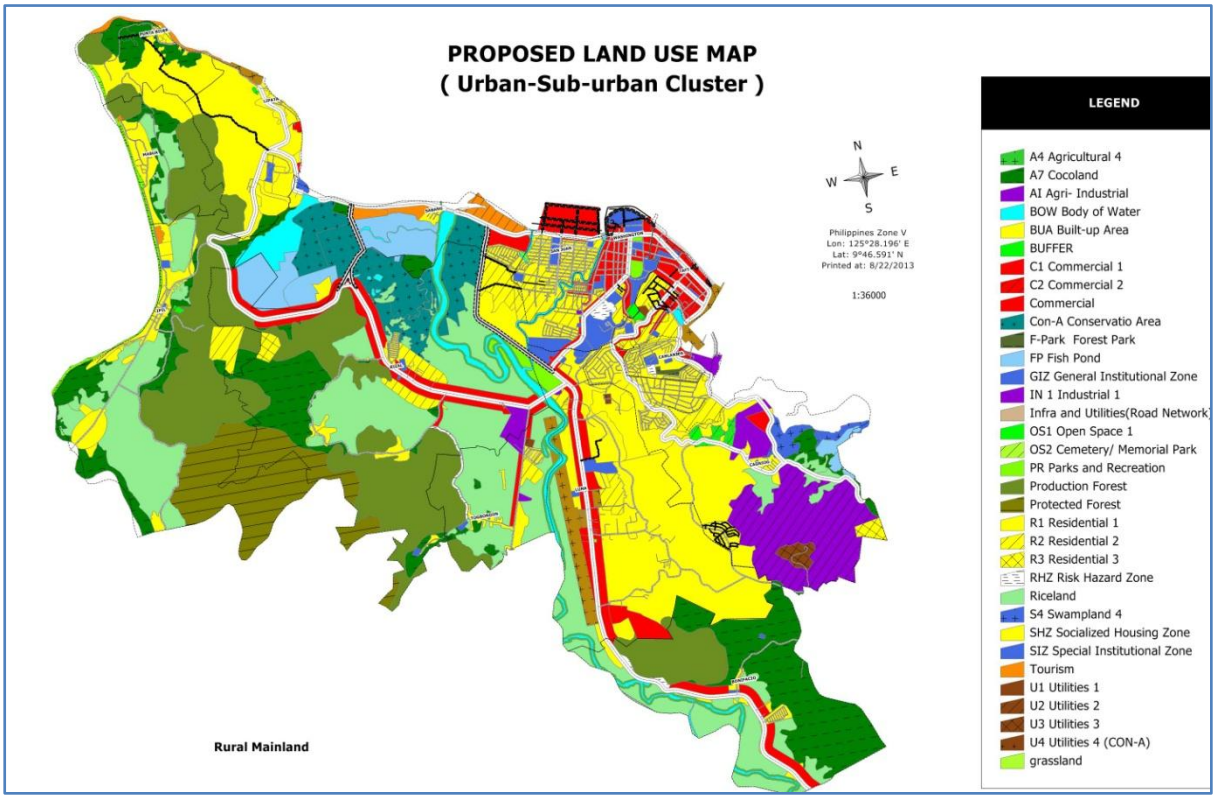
5.1.4 Institutional Land Use

In order to comply with the prescribed standards for institutional facilities, there is an additional land requirement of 36 hectares. Such would include the construction of 12 health centers and 13 day care centers, standardize the existing school sites in elementary and secondary schools, as well as substandard protective facilities. There may also be a need to relocate facilities which have been temporarily constructed in environmentally hazardous locations.

In education specifically, an additional area of 12 hectares is needed for the elementary level and 23 hectares for secondary level, based on the standard sizes for school sites and given the number of classes in the elementary and secondary levels.

Sub-standard school sites translate to substandard basic physical facilities support. However, expansion for centrally-located schools where enrollment rate is high, is constrained due to the absence of space. In order to sustain a standard Classroom to pupil/student ratio, vertical expansion is recommended. The introduction of local enrollment policies to decongest pupil/student population especially in centrally located schools is another option to address the issue.

Within the planning period, a total land area of 67.4 hectares is proposed for institutional facilities within the urban area to address the current backlog and allow also the establishment and/or expansion of existing facilities that are deemed necessary to address the current and projected needs and demands of the population. Such will also address the vulnerability of these facilities to environmental hazards thereby enhancing further the delivery of services by the local government and other future development requirements. While only two (2) hectares are deemed needed for future requirements, the bigger bulk of land requirement for the institutional facilities are integrated already under the built-up category particularly those facilities which are located in poblacion areas of the rural mainland and rural island barangays.



5.1.5 Parks, Playground and other Recreational Facilities

Although there is presently an ample number of facilities and existence of natural potential areas for sports and recreation in the city, an additional area of 11.59 hectares is proposed for the sector within the planning period in order to accommodate strategic developmental projects particularly the proposed improvement of areas along the Kinabutan river in Barangay Luna and expansion of the boulevard. Certain areas particularly in Barangay Luna are also proposed for conversion into parks and recreation owing to their characters. Open spaces and playgrounds, on the other hand, are already incorporated in the development of subdivision plans per the Housing and Land Use Regulatory Board (HLURB) Guidelines.

5.1.6 Cemeteries/Memorial Parks

Owing to the present dilapidated and congested state of the existing city public cemetery, there is a need to allocate a suitable area for the development of a better and modernized cemetery as well as to address the projected increase in the need for burial space within the planning period. Hence an additional area of 14.70 is proposed under this land use category for this particular strategic development requirement.

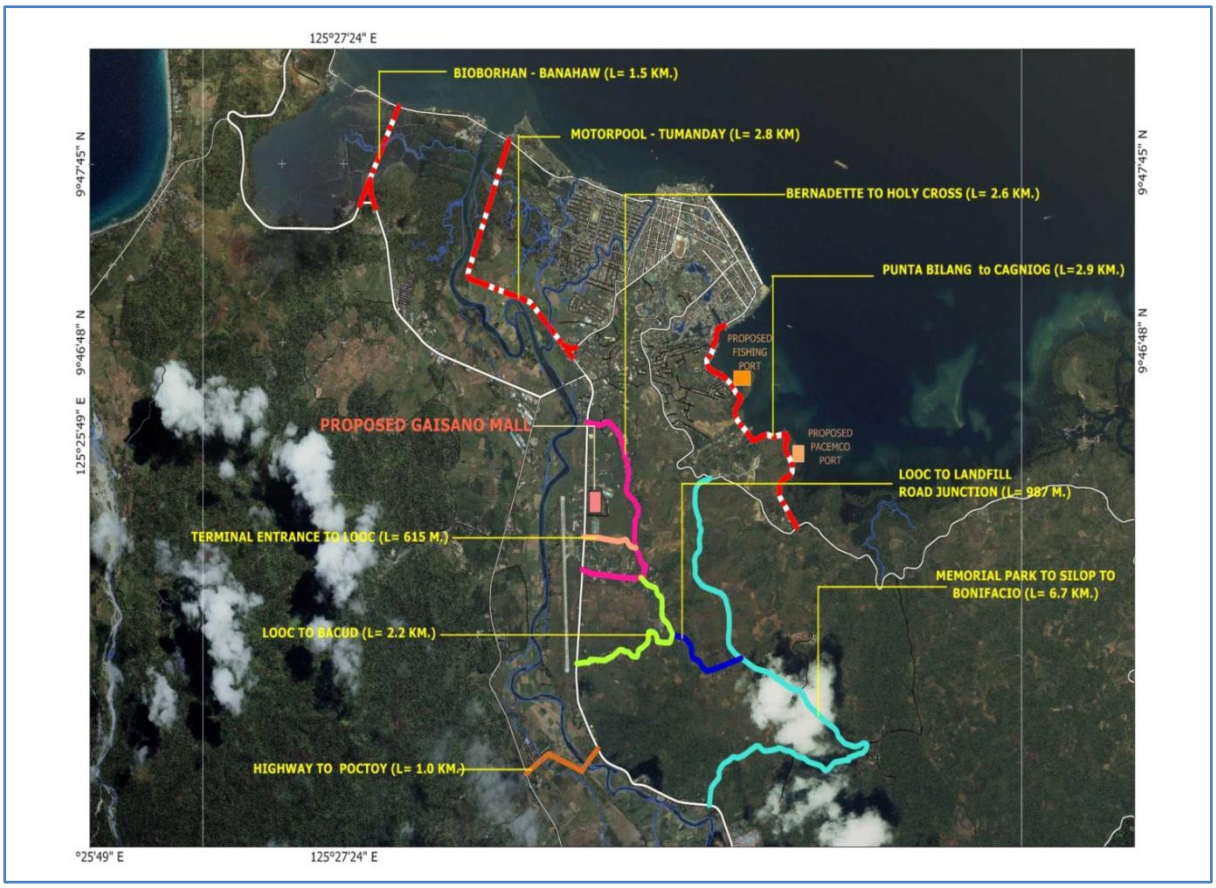
5.1.7 Infrastructure

The construction of arterial roads will provide wider access in the transport of people and goods in and out of the city and eventually can reduce traffic congestion in the urban area. Standard road right of way sizes will be implemented accordingly with parallel flood control projects such as drainage canals will be the major developments in the urban and sub-urban districts. Proposed airport expansion will involve the construction of additional 300 meters connecting the north end of runway 18 having 36 meters in width, with an expansion area of 1.08 hectares.

Surigao Baseport and Lipata Ferry Terminal will be expanded as well to allow wider vessel maneuvers. Moreover, the Port of Lipata will be expanded by a total of 1.139 hectares extension. The proposed land use total area for the infrastructure and utilities in urban and sub-urban area is 393.04 hectares.

Mainland road network especially the expanse of existing national roads will be expanded with additional two (2) lanes proposed for construction, especially the section beginning from the corner of National Highway-Roxas Street and the rest of the sections of the Surigao-Agusan Road. Road expansion shall also be undertaken along the national highway fronting the Surigao Base Port. Development/opening of new roads and improvement or expansion of existing ones to allow additional arterial access and better circulation to and from the CBD connecting the national roads shall likewise be pursued especially the following road sections, viz:

- So. Bioborhan, Brgy. Rizal to So. Banahaw, Brgy. Lipata 1.5 kms.
- City Motorpool to So. Tumanday, Brgy. Sabang 2.8 kms.
- Bernadette Village to Holy Cross Village, Brgy. Luna 2.6 kms.
- So. Looc, Brgy. Luna to Sanitary Landfill Road Junction 0.98 km.
- Surigao Memorial Park to Brgy. Silop 6.7 kms.
- Km. 7 National Highway to Brgy. Poctoy 1.0 km.
- So. Looc to So. Bacud, Brgy. Luna 2.2 kms.
- Transport Terminal entrance to So. Looc, Brgy. Luna 0.615 km.



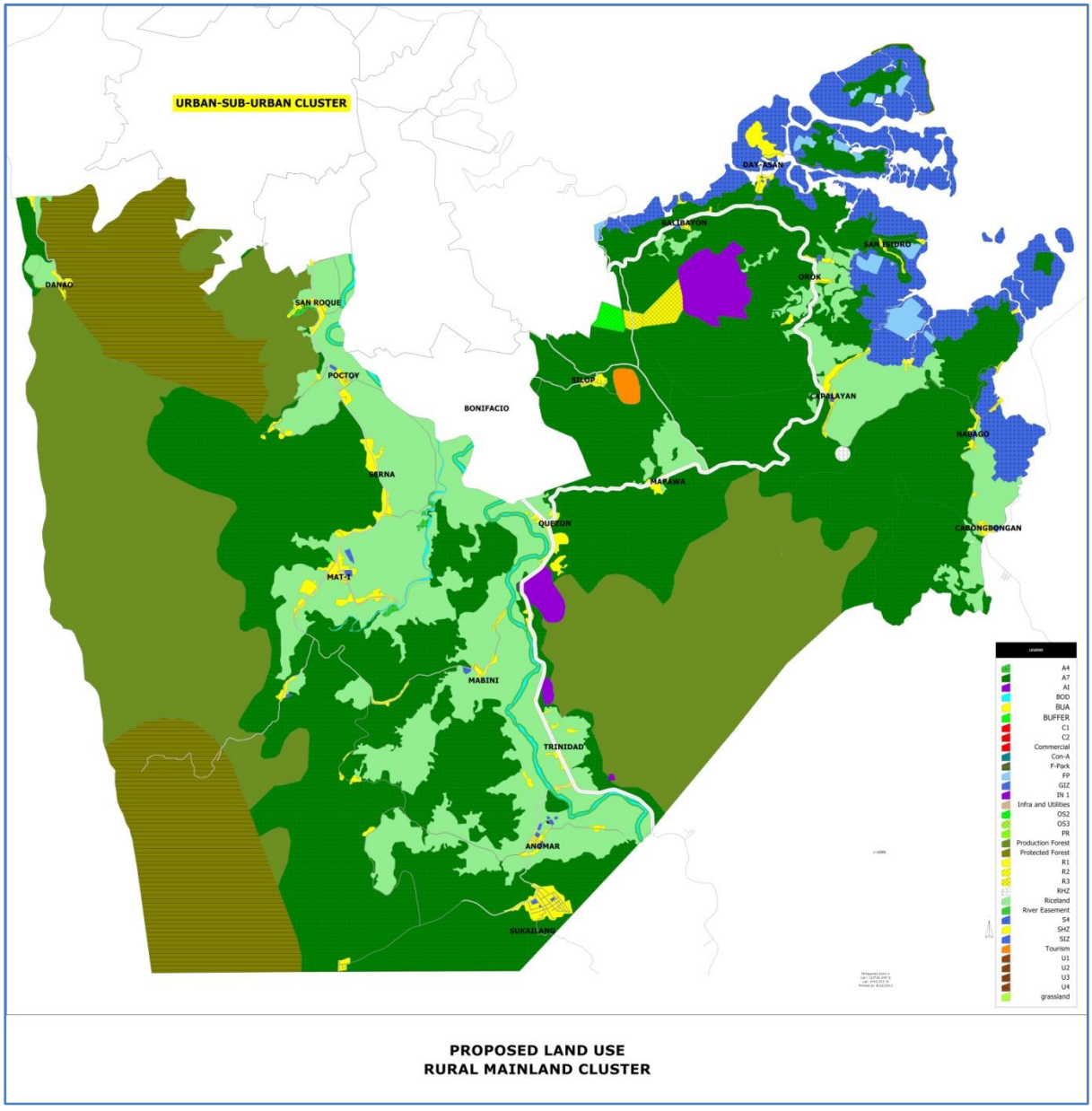
Proposed arterial roads within the city mainland.

Existing lateral road and other farm to market roads will be subjected to concreting for a better, improved and strong road network along the national circumferential routes and city/ barangay roads. Total proposed road land use area is 200 hectares.

Hikdop, Sibale and Bayagnan islands are proposed to have their respective circumferential road constructions having a total of 51.22 hectares for concreting within the plan period.

5.2 General Land Uses

Outside of the urban and suburban cluster, general land use categories were used given the relatively small scale and slow rate of physical development that the rural barangays both in the mainland and islands currently exhibits. The general land uses are mostly focused on maintaining the critical balance between the requirements of protection and conservation particularly forest categories, mangrove swamps, agricultural production areas, industrial areas and pocket mixed use rural communities lumped into built-up areas.

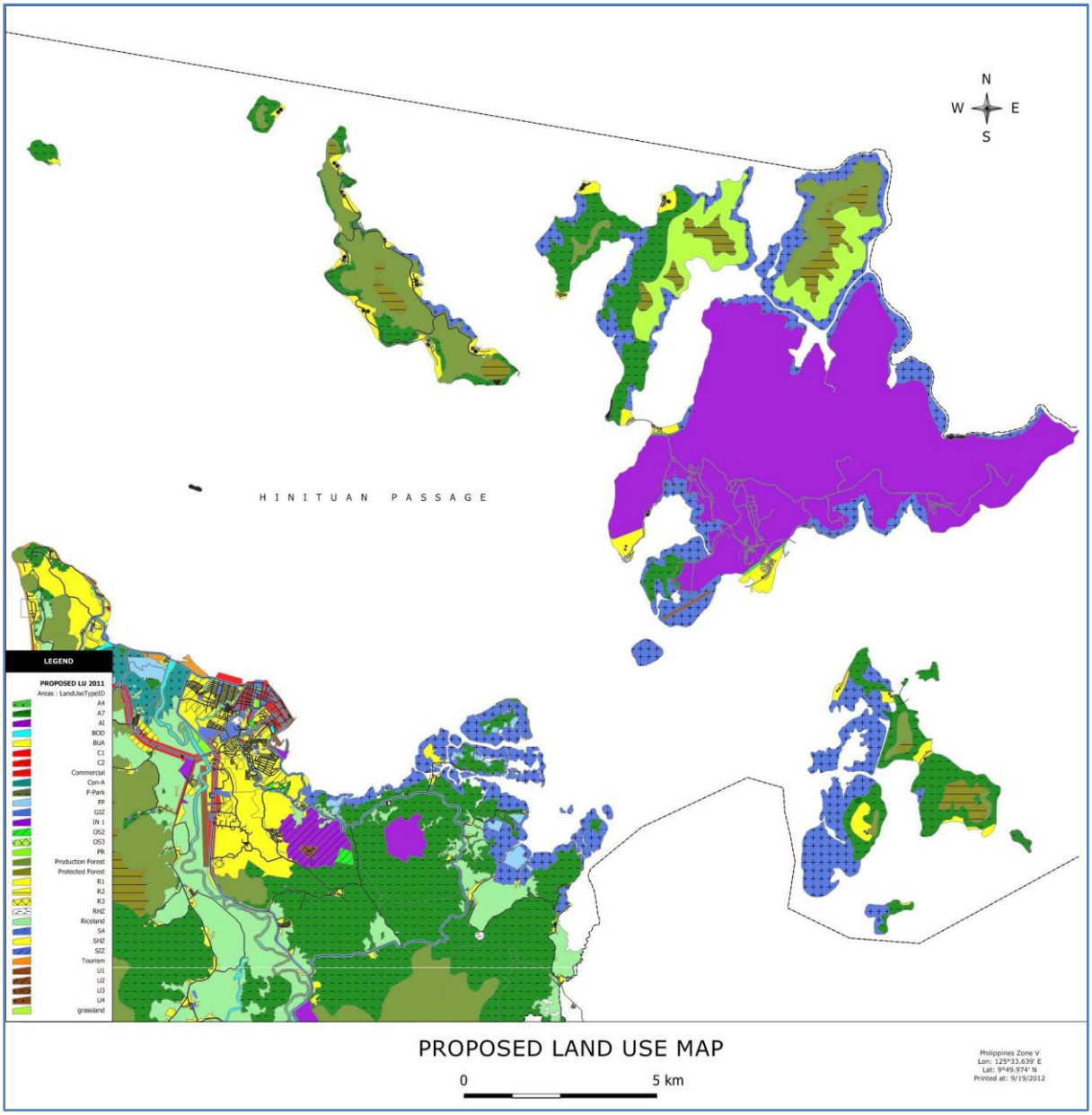


Proposed general land use map in the rural mainland barangays.

The largest area in the general land use category covers primary agricultural lands and crop lands totaling more or less 13,688.14 hectares. These are mostly concentrated in the primary agricultural lands located along the banks of the Surigao River and the crop lands in the rolling hills adjacent to these rice lands in the south central mainland barangays. A large portion of crop lands can also be found in the southwest barangays of Arellano District.

Forest lands also occupy a sizable area covering more or less 6,280 hectares. These consist of protection forests in the upland areas inclusive of the city's primary watershed located in the upland areas of Brgys. Mat-i and Mabini and in Lumaban, Brgy. Rizal.

In the islands, the major bulk is industrial use covering Nonoc Island with an area of about 4,000 hectares. This industrial area forms part of the Surigao Mineral Reservation and is currently zoned for heavy industrial use allied with mining and mineral processing.



Proposed general land use map in the rural island barangays.

5.3 Summary of Land Use Area Requirement *(all figures are in hectares)*

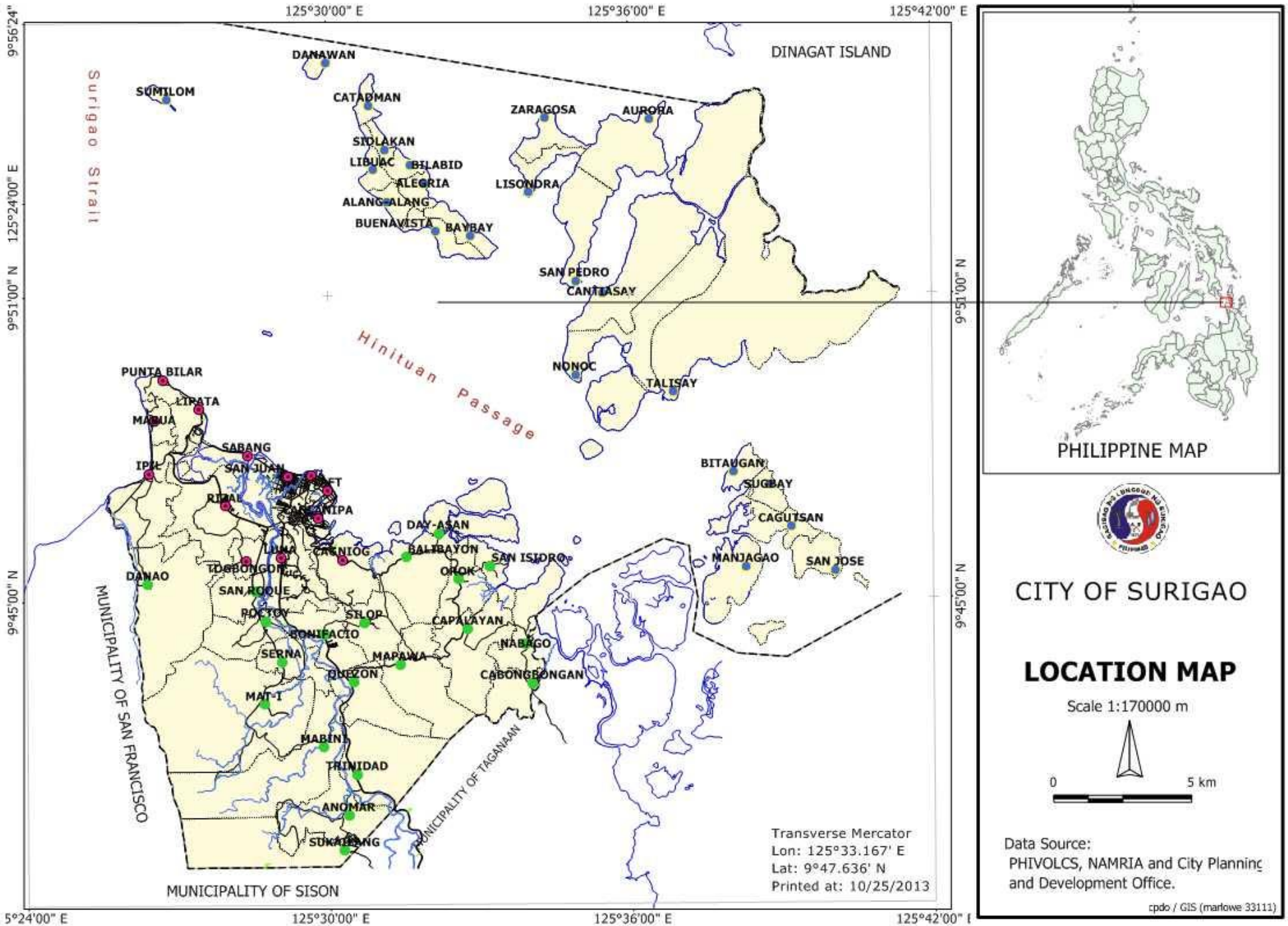
LAND USE CATEGORIES	PROPOSED LAND USE AREAS (2011-2020)
Residential	**763.10**
Commercial	**176.48**
Infrastructure/Utilities	**644.30**
Institutional	**67.43**
Parks/Playground and other Recreational Spaces	**17.00**
Industrial	**4,074.87**
Built up area	**935.10**
Agriculture	**13,688.14**
- Rice and Corn Land	**3,159.40**
- Cocoland	**10,309.46**
- Cropland	**219.28**
Forest and Forest Categories	
- Protected Forest	**1,790.17**
- Production Forest	**4,490.00**
- Grassland/Pasture	**1,600.86**
Agro-Industrial	**167.00**
Tourism	**86.00**
OTHER USES	
Cemetery/Mem. Park	**25.70**
Dumpsites/Sanitary Landfill	**14.00**
Buffer Zones/Easements	**42.00**
Conservation Area	**128.00**
Risk/Hazard Area	**8.84**
Water Uses	
- Nipa, Swamps, mangroves	**2,822.50**
- Bodies of water (rivers & tributaries)	**145.20**
- Aquaculture and Mariculture	**325.77**
Total	**32,337.93**

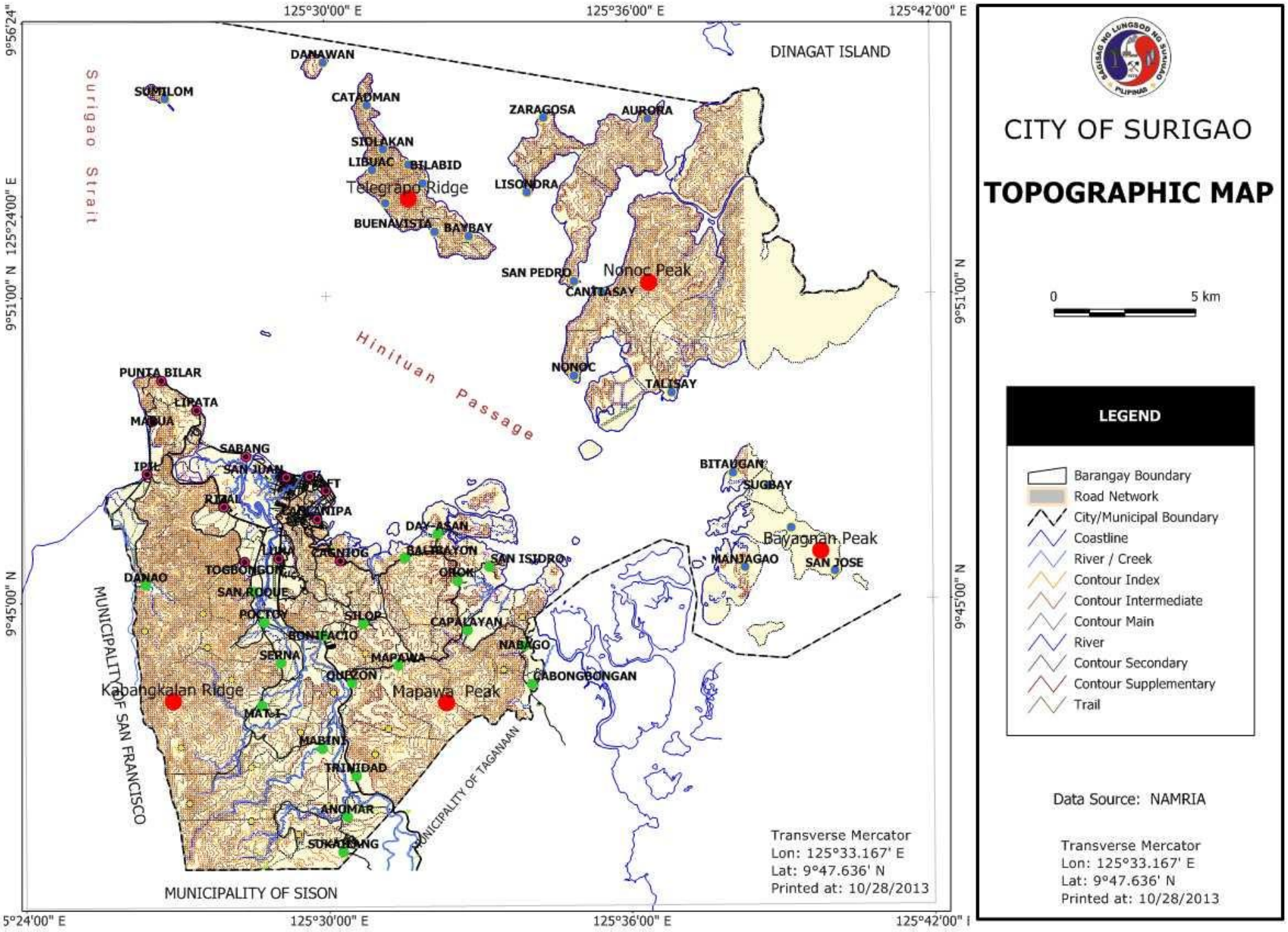
CHAPTER 6
General Land Use Policies

General Policies/Area-Based Indicators/Descriptors

- Urban
    - Discourage further development in critical flood prone areas unless mitigating measures are in-place
    - Clearing of settlements along river banks, coastal areas and other hazardous areas
    - Densification of existing residential/commercial/institutional areas and facilities, e.g. vertical expansion
    - Development of alternative area to decongest the CBD – proposed coastal reclamation in San Juan for mixed use commercial, high-density/high-end residential, parks and recreation/open space development front the coast to double up as buffer for storm surges
    - Implementation of 3-meter legal easements along riverbanks, setbacks along roads/streets, and parking requirements for commercial establishments
- Sub-Urban/Tourism
    - Subject to designated spatial development role, the area serves as the immediate urban expansion area for settlements, commercial development
    - Development of commercial strip along main arteries/national highway (Luna to Bonifacio, Rizal areas)
    - Preservation of remaining swamps, mangroves, wetland areas
    - 20-meter salvage zone along coastal areas should be free from any permanent development
    - Zone areas for specific tourism-related activities, e.g. eco-tourism, parks, beaches, etc.
- Agricultural, Agri-Industrial, Agri-Fishery-Tourism Zones (Islands)
    - Maintain and develop SAFDZs
    - No conversion of prime agricultural lands to other uses
    - Limit conversion of marginal crop lands to strategic and optimum land utilization
    - Protection and preservation of strategic coastal areas and sanctuaries
    - Implementation of 20-meter legal easements and buffer zones in coastal/river bank areas
- Industrial Zones
    - Promotion of responsible mining with emphasis on the preservation of ecological balance (upland-lowland-coastal ecosystems)
    - No development in watershed areas and observance of legal buffer zones
    - Preservation of critical slopes unless otherwise structural mitigating measures shall be introduced
    - Structural designs shall conform with integrity standards to withstand PEIS VIII earthquake
    - Implementation of 40-meter legal easements and buffer zones in coastal/river bank areas
- New-Township/Townsite Development
    - Intended for mixed use development in the suburban areas of Lipata-Punta Bilar-Mabua in the west, and in Luna-Silop-Cagniog area
    - Aims to decongest the CBD/urban core and provide areas for large scale mixed use property development

MAPS


125°30'00" E
125°36'00" E
125°42'00" E
9°56'24"
9°51'00" N
9°45'00" N
5°24'00" E
DINAGAT ISLAND
DANAWAN
SUMILOM
CATADMAN
SIOLAKAN
LIBUAC
BILABID
ALEGRIA
ALANG-ALANG
BUENAVISTA
BAYBAY
ZARAGOSA
AURORA
LISONDRA
SAN PEDRO
CANTIASAY
NONOC
TALISAY
Surigao Strait
Hinituan Passage
PUNTA BILAR
LIPATA
MAPUA
SABANG
IPIL
SAN JUAN
RIZAL
DAY-ASAN
LIMA
CAGNIOG
BALIBAYON
SAN ISIDRO
ORLOK
DANAO
TAGBONGON
SAN ROQUE
ROXTOY
SILOP
CAPALAYAN
BONIFACIO
NABAGO
SERNA
MAPAWA
QUEZON
CABONGBONGAN
MAT-I
MABINI
TRINIDAD
ANOMAR
SUKAILANG
MUNICIPALITY OF SAN FRANCISCO
MUNICIPALITY OF TAGANAAN
MUNICIPALITY OF SISON
BITAUGAN
SUGBAY
CAGUTSAN
MANJAGAO
SAN JOSE
Transverse Mercator
Lon: 125°33.167' E
Lat: 9°47.636' N
Printed at: 10/25/2013
PHILIPPINE MAP
CITY OF SURIGAO
LOCATION MAP
Scale 1:170000 m
0
5 km
Data Source:
PHIVOLCS, NAMRIA and City Planning and Development Office.
cpdo / GIS (marlowe 33111)



CITY OF SURIGAO

TOPOGRAPHIC MAP

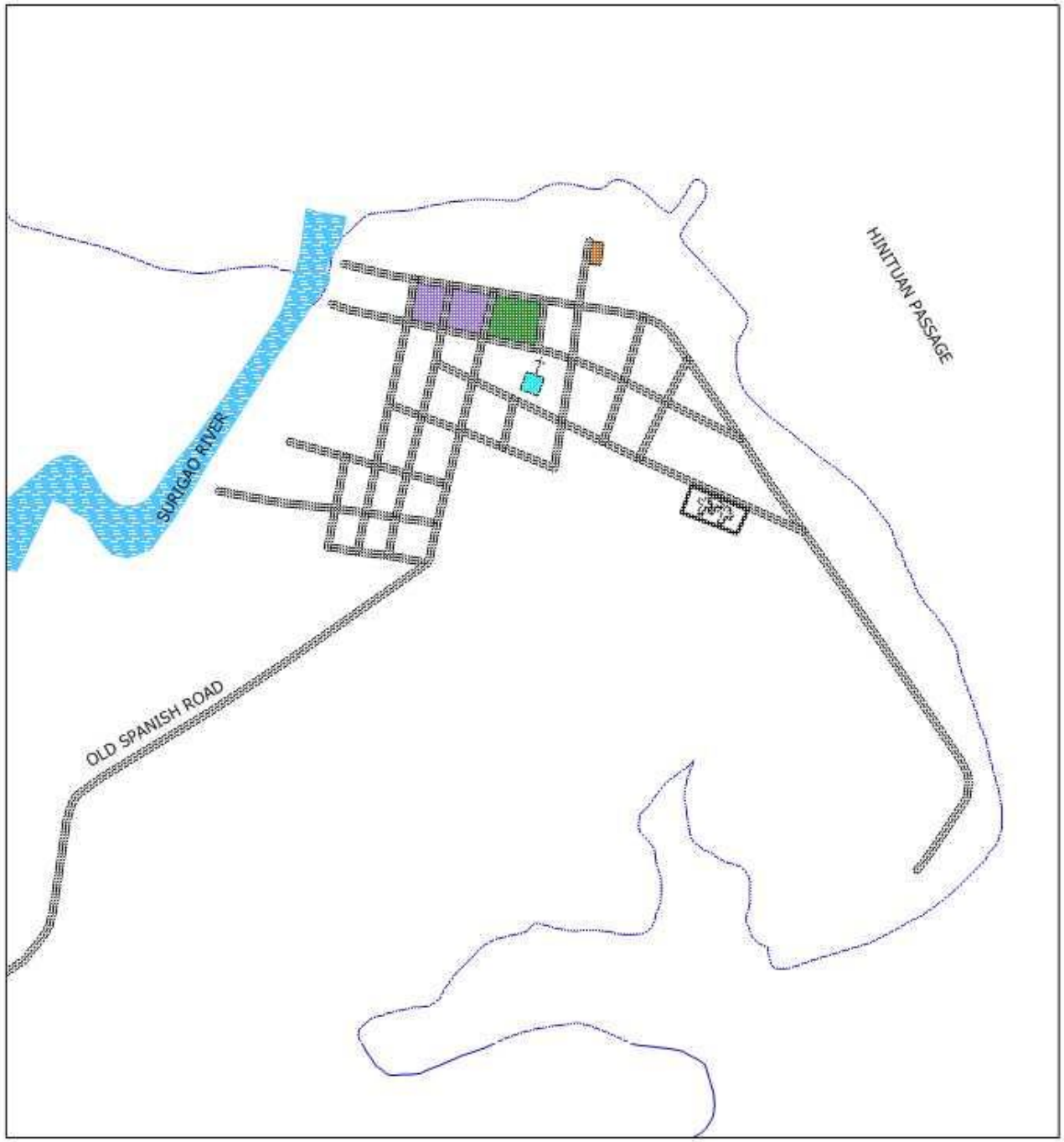
0 5 km

LEGEND

- Barangay Boundary
- Road Network
- City/Municipal Boundary
- Coastline
- River / Creek
- Contour Index
- Contour Intermediate
- Contour Main
- River
- Contour Secondary
- Contour Supplementary
- Trail

Data Source: NAMRIA

Transverse Mercator
Lon: 125°33.167' E
Lat: 9°47.636' N
Printed at: 10/28/2013



SURIGAO IN 1907

N
W E
S

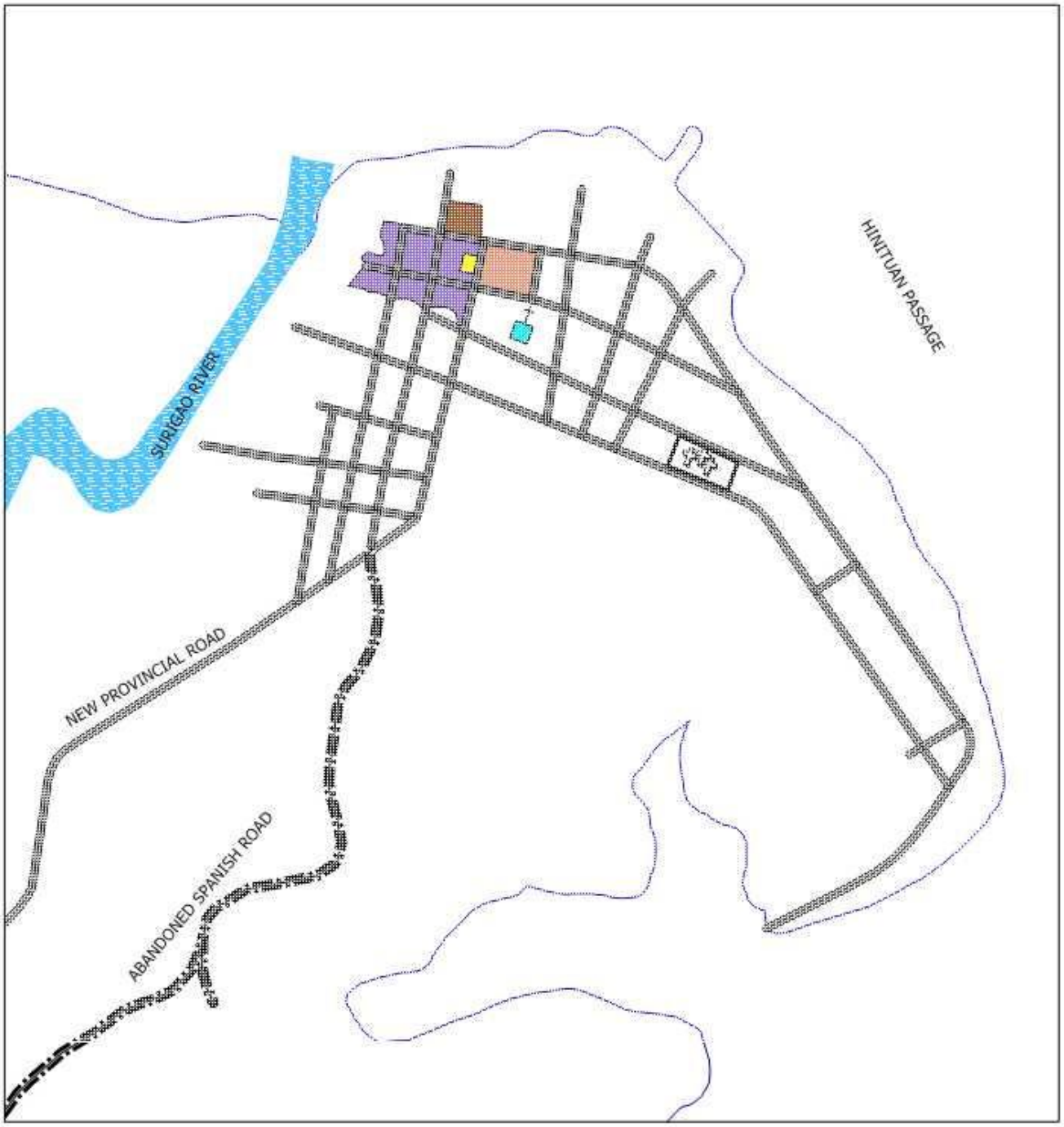
SCALE : 1:10000 m

0 500 m

LEGEND

- Commercial Area
- Public Market
- Plaza
- Cemetery
- Church

Philippines Zone V
Lon: 125°29.545' E
Lat: 9°47.271' N
Printed at: 11/19/2013



SURIGAO IN 1930

N
W
E
S

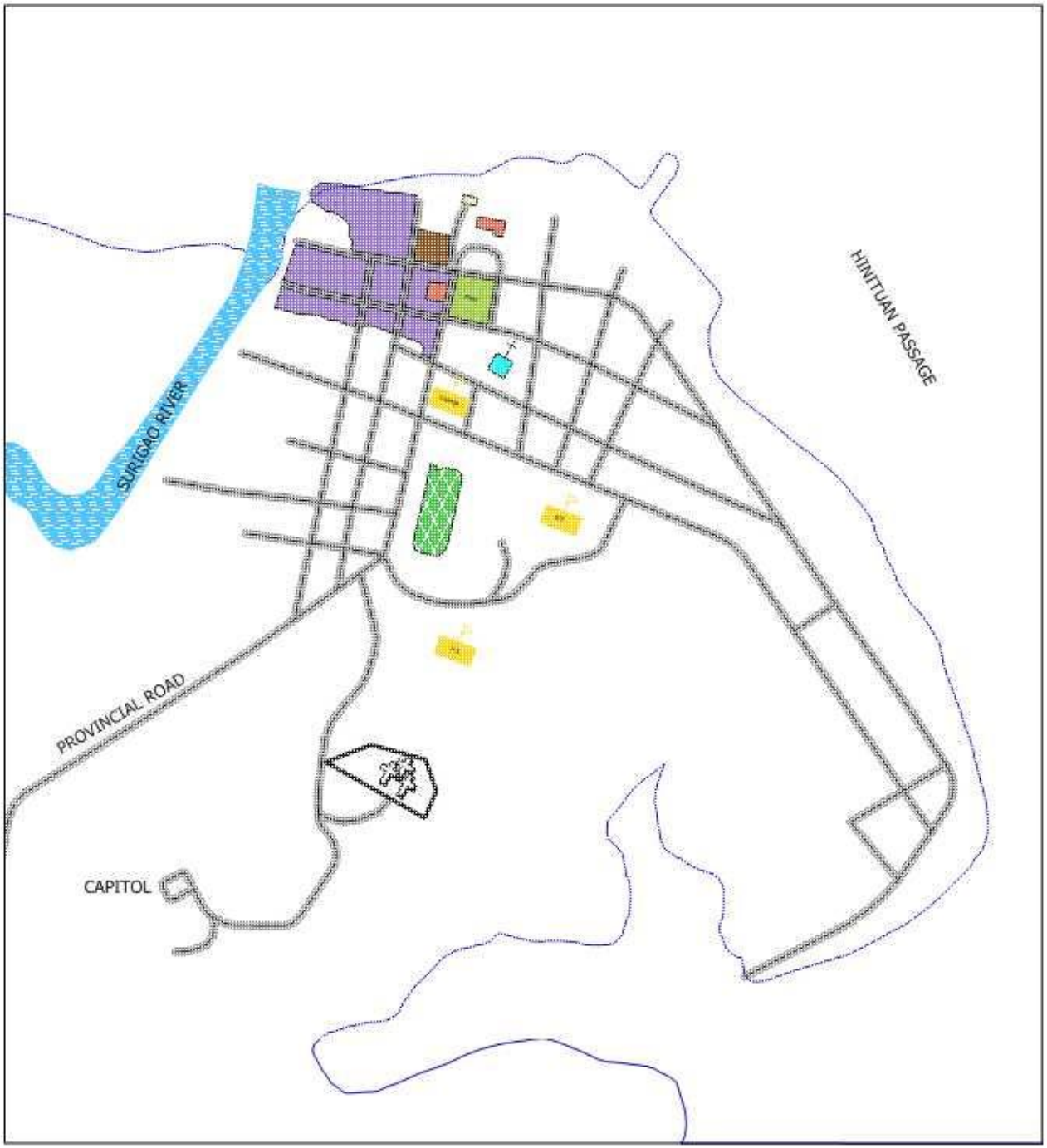
SCALE : 1:10000 m

0 500 m

LEGEND

- Cemetery
- Church
- Casa Real
- Commercial Area
- Plaza
- Public Market

Philippines Zone V
Lon: 125°29.552' E
Lat: 9°47.236' N
Printed at: 11/19/2013



SURIGAO IN 1950

N
W E
S

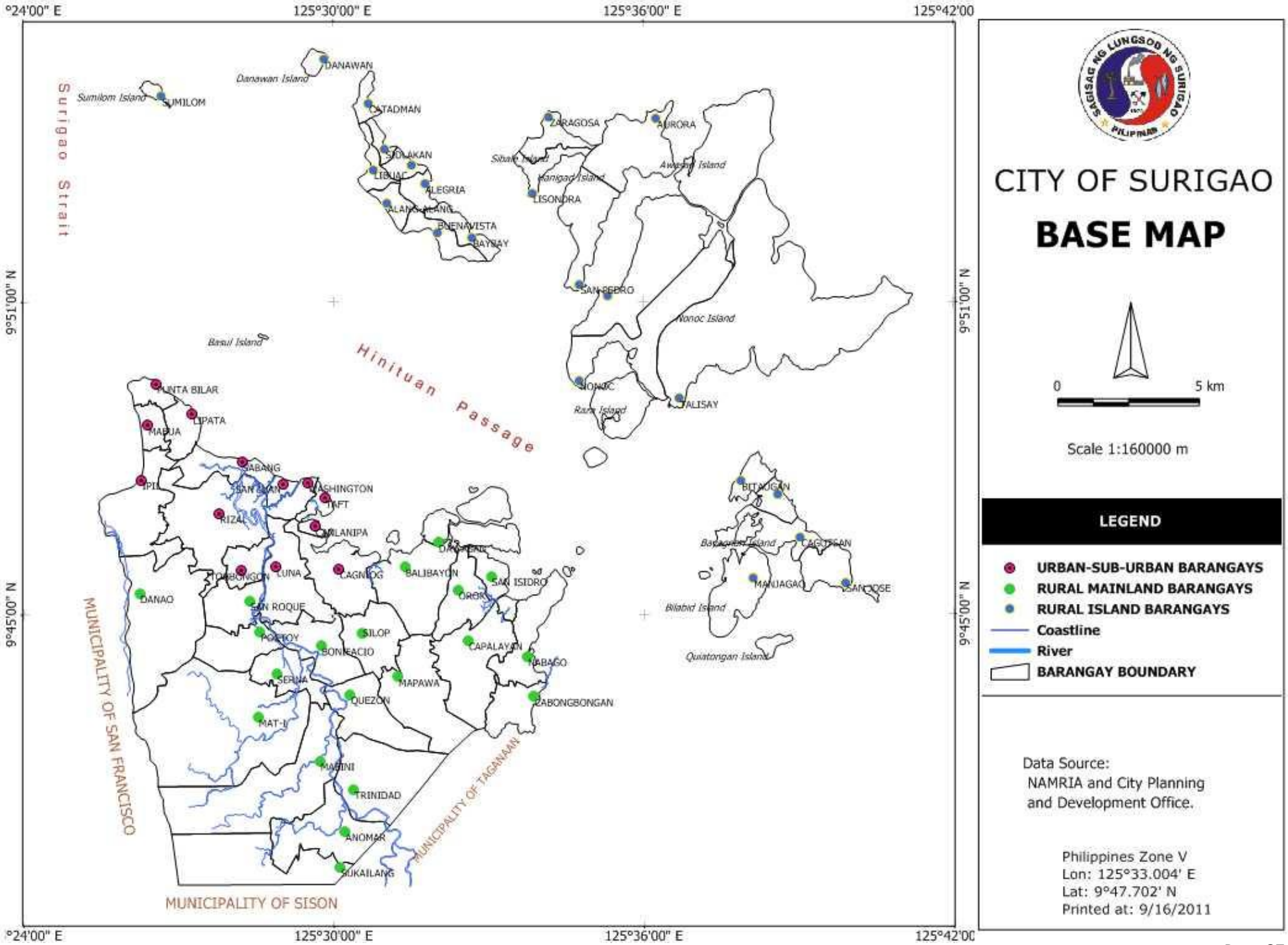
scale 1:10000 m

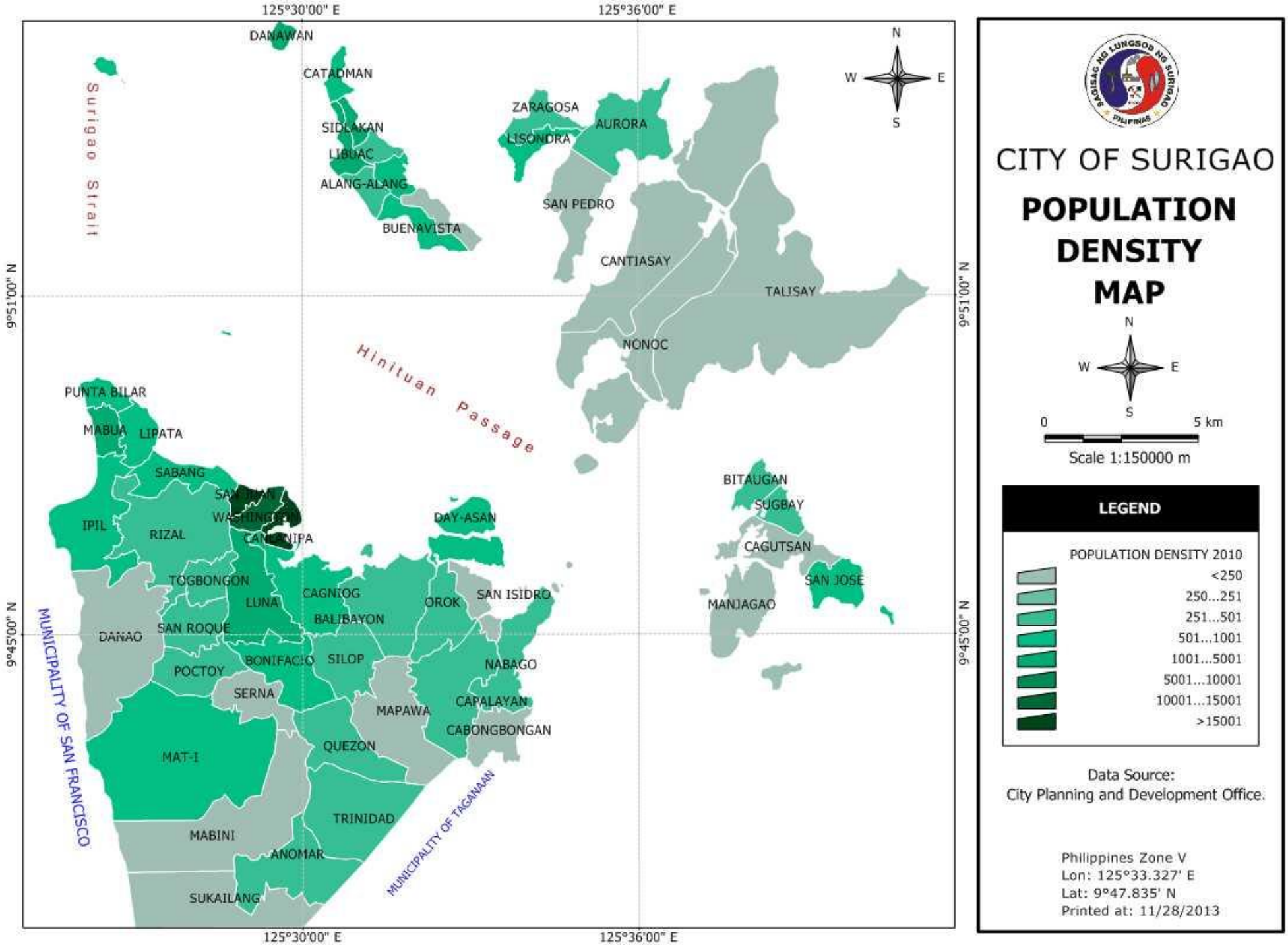
0 500 m

LEGEND

- Cemetery
- Church
- Athletic Field
- Casa Real
- Commercial Area
- Plaza
- Post Office
- Public Market
- School

Philippines Zone V
Lon: 125°29.571' E
Lat: 9°47.261' N
Printed at: 11/19/2013


°24'00" E
125°30'00" E
125°36'00" E
125°42'00
9°51'00" N
9°45'00" N
Surigao Strait
Hinituan Passage
Sumilom Island
SUMILOM
Danawan Island
DANAWAN
CATADMAN
SOLAKAN
LIBJAC
ALEGRIA
ALANIB-ALANIB
BUENAVISTA
BAYBAY
ZARAGOSA
AURORA
Siburan Island
Kanigad Island
Awasian Island
LISONDRA
SAN PEDRO
Nonoc Island
Basul Island
NONOC
Rasa Island
TALISAY
PUNTA BILAR
LIPATA
MABUA
SABANG
IPIL
SAN JUAN
WASHINGTON
CAFT
RIZAL
CARLANIPA
CAGNIPA
LUNA
CAGNIOG
BALIBAYON
SAN ISIDRO
ORGO
DANAO
SAN ROQUE
POBLACION
SILOP
BONIFACIO
CAPALAYAN
TABAGO
SERNA
MAPAWA
QUEZON
CABONGBONGAN
MAT-I
MAGINI
TRINIDAD
ANOMAR
BUKAILANG
MUNICIPALITY OF SAN FRANCISCO
MUNICIPALITY OF TAGANAAN
MUNICIPALITY OF SISON
BITAUGAN
Bacuag Island
CAGUTSAN
MANJAGAO
SAN JOSE
Bilabid Island
Quiatongan Island
SAGISAG NG LUNGSOD NG SURIGAO
PILIPINAS
CITY OF SURIGAO
BASE MAP
0
5 km
Scale 1:160000 m
LEGEND
URBAN-SUB-URBAN BARANGAYS
RURAL MAINLAND BARANGAYS
RURAL ISLAND BARANGAYS
Coastline
River
BARANGAY BOUNDARY
Data Source:
NAMRIA and City Planning
and Development Office.
Philippines Zone V
Lon: 125°33.004' E
Lat: 9°47.702' N
Printed at: 9/16/2011



CITY OF SURIGAO

POPULATION DENSITY MAP

N
W E
S

0 5 km

Scale 1:150000 m

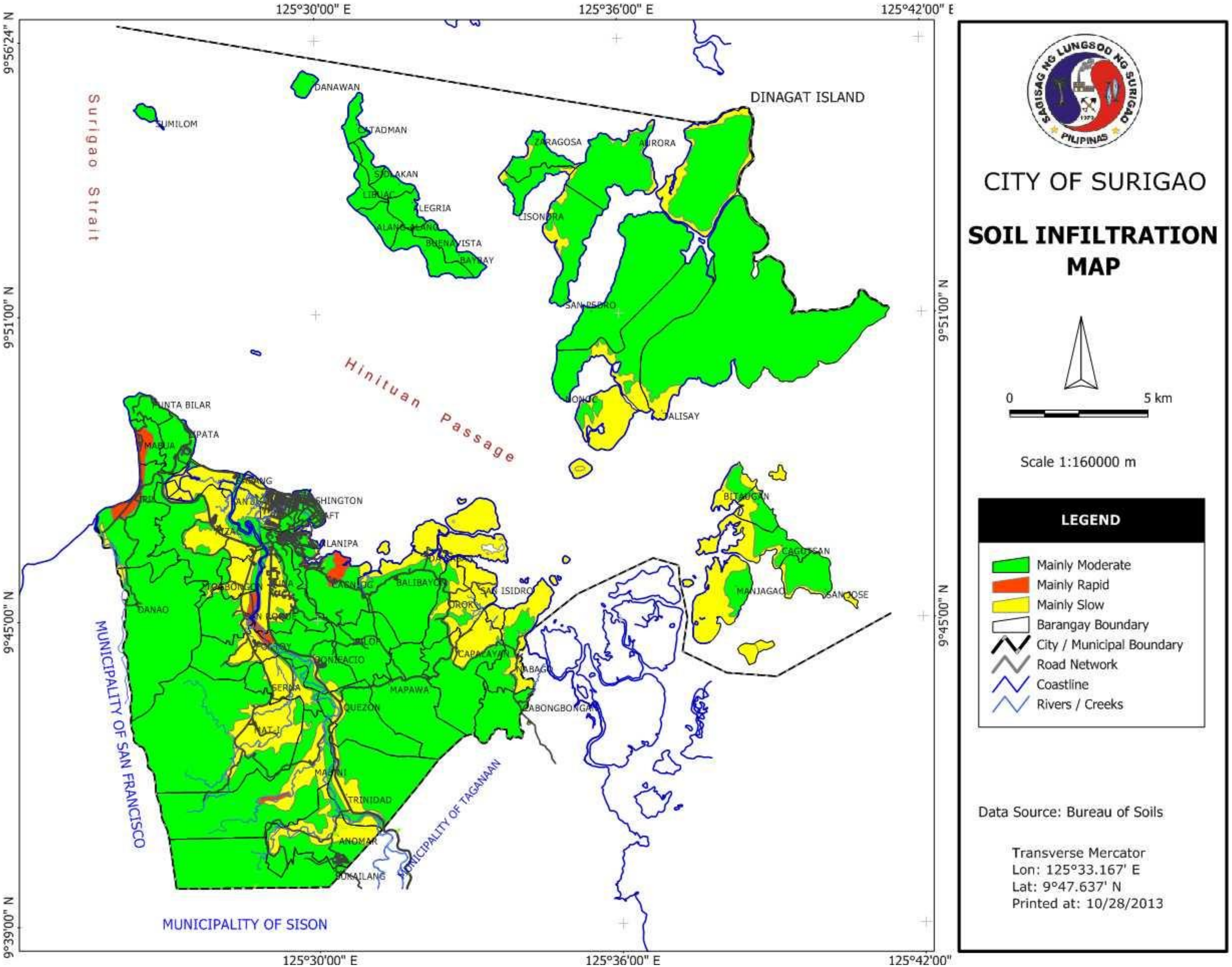
LEGEND

POPULATION DENSITY 2010

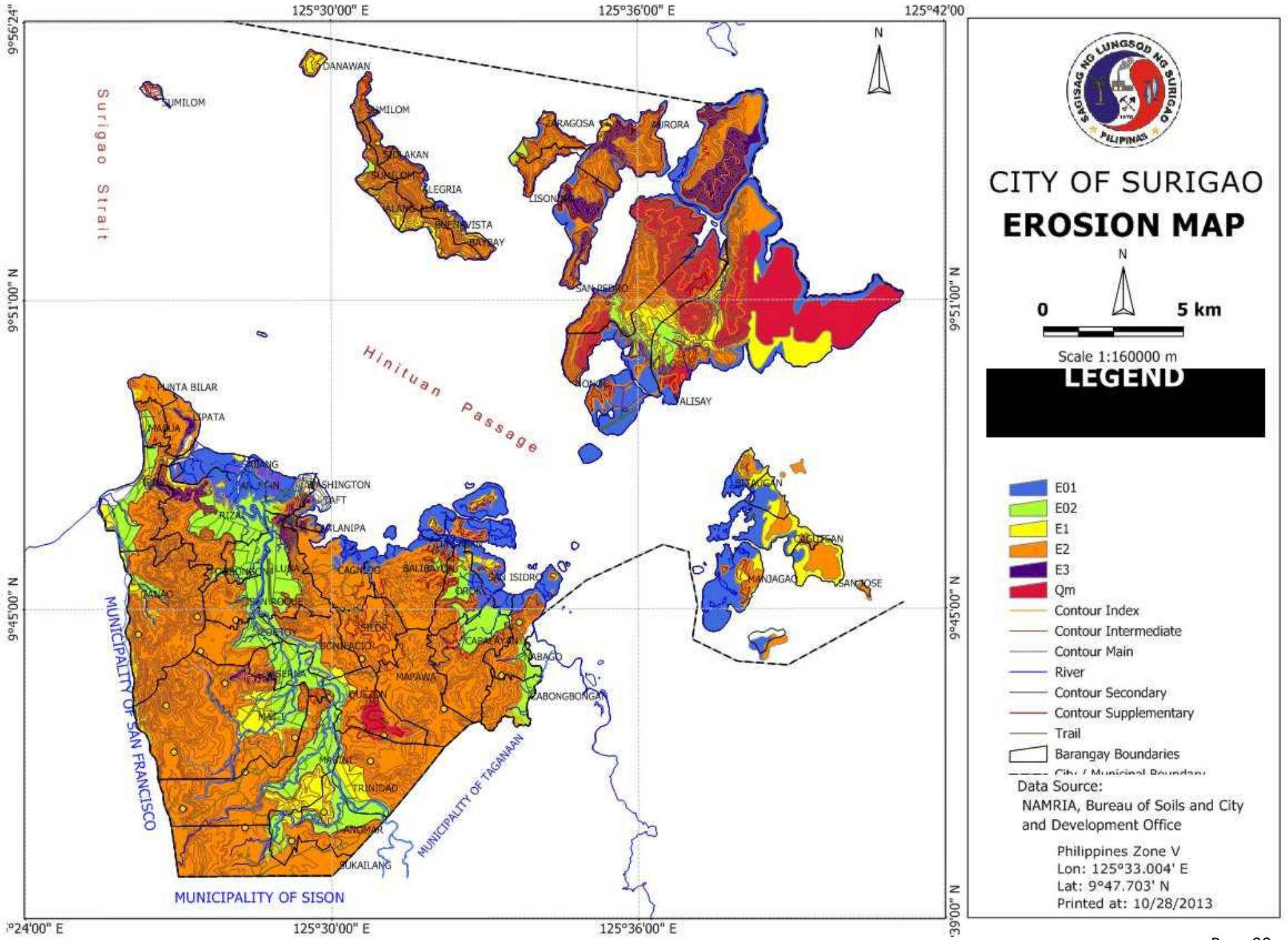
- <250
- 250...251
- 251...501
- 501...1001
- 1001...5001
- 5001...10001
- 10001...15001
- >15001

Data Source:
City Planning and Development Office.

Philippines Zone V
Lon: 125°33.327' E
Lat: 9°47.835' N
Printed at: 11/28/2013



CITY OF SURIGAO
SOIL INFILTRATION MAP
SAGISAG NG LUNGSOD NG SURIGAO
PILIPINAS
0
5 km
Scale 1:160000 m
LEGEND
Mainly Moderate
Mainly Rapid
Mainly Slow
Barangay Boundary
City / Municipal Boundary
Road Network
Coastline
Rivers / Creeks
Data Source: Bureau of Soils
Transverse Mercator
Lon: 125°33.167' E
Lat: 9°47.637' N
Printed at: 10/28/2013
125°30'00" E
125°36'00" E
125°42'00" E
9°56'24" N
9°51'00" N
9°45'00" N
9°39'00" N
Surigao Strait
Hinituan Passage
DINAGAT ISLAND
MUNICIPALITY OF SAN FRANCISCO
MUNICIPALITY OF TAGANAAN
MUNICIPALITY OF SISON
DANAWAN
SUMILOM
CATADMAN
SIDLAKAN
LIBUAC
ALEGRIA
ALANG-ALANG
BUENAVISTA
BAYBAY
ZARAGOSA
AURORA
LISONDRA
SAN PEDRO
PONDOC
ALISAY
BITAUGAN
CAGUTSAN
MANJAGAO
SAN JOSE
PUNTA BILAR
IPATA
MABUA
WASHINGTON
LUNA
TAFT
CANLANIPA
DANAO
BALIBAYON
SAN ISIDRO
CAPALAYAN
BONIFACIO
MAPAWA
QUEZON
TRINIDAD
ANOMAR
SUKAILANG
CABONGBONGAN



CITY OF SURIGAO

EROSION MAP

N

0 5 km

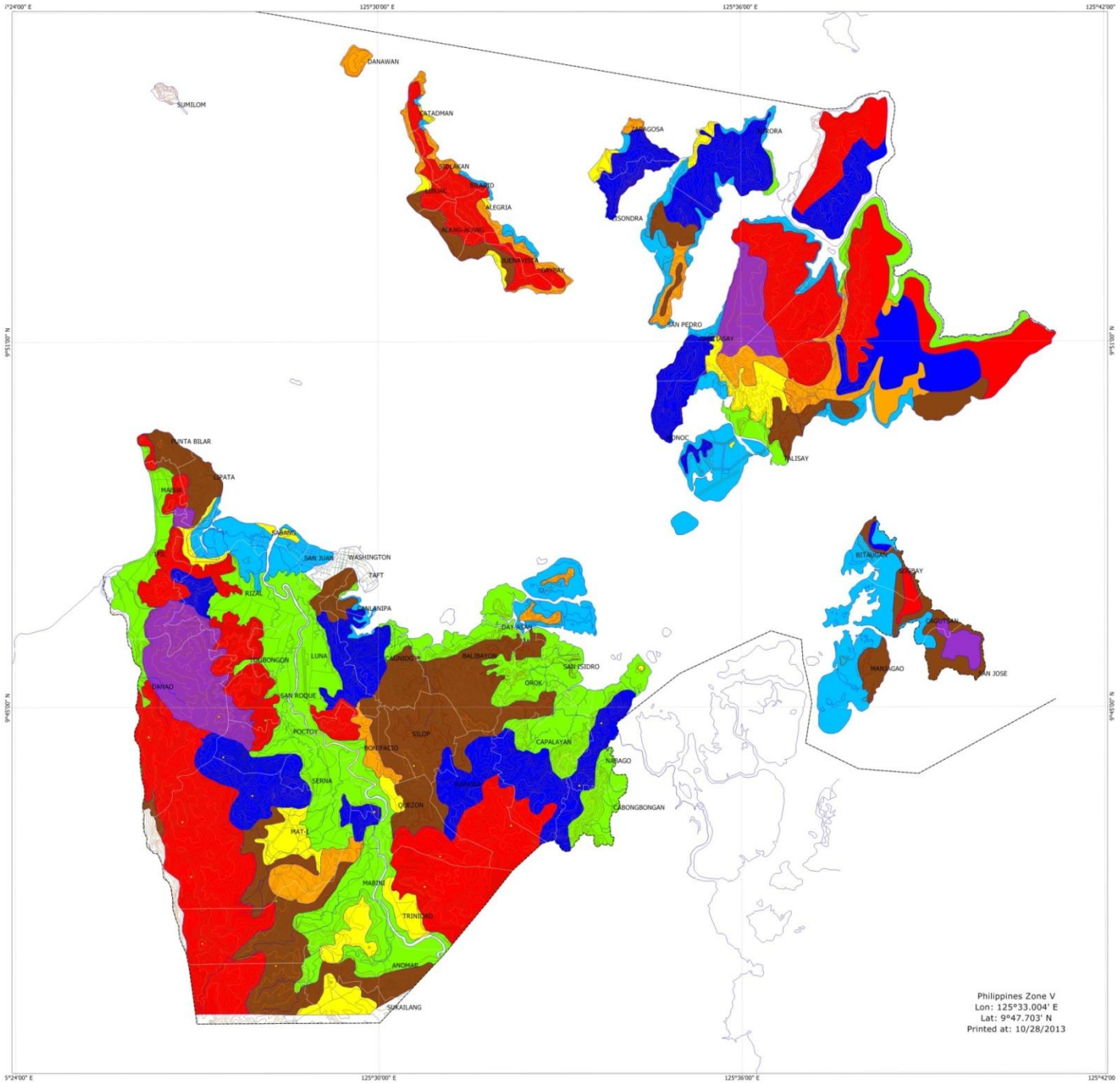
Scale 1:160000 m

LEGEND

- E01
- E02
- E1
- E2
- E3
- Qm
- Contour Index
- Contour Intermediate
- Contour Main
- River
- Contour Secondary
- Contour Supplementary
- Trail
- Barangay Boundaries
- City / Municipal Boundary

Data Source:
NAMRIA, Bureau of Soils and City and Development Office

Philippines Zone V
Lon: 125°33.004' E
Lat: 9°47.703' N
Printed at: 10/28/2013



SAGISAG NG LUNGSOD NG SURIGAO
PILIPINAS

CITY OF SURIGAO

Province of Surigao del Norte
CARAGA Region XIII

N
W E
S

0 5 km

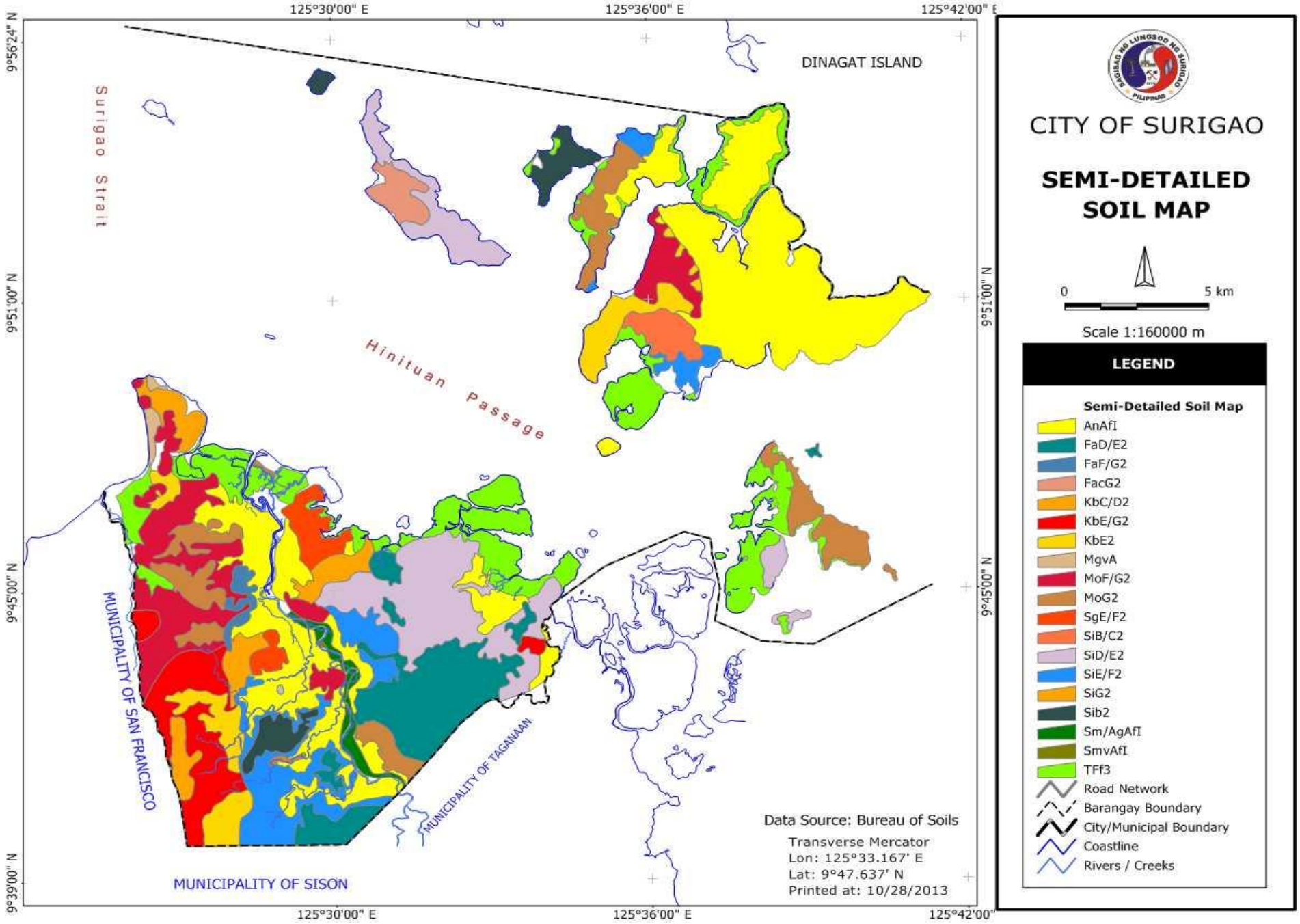
scale : 1:50000 meters

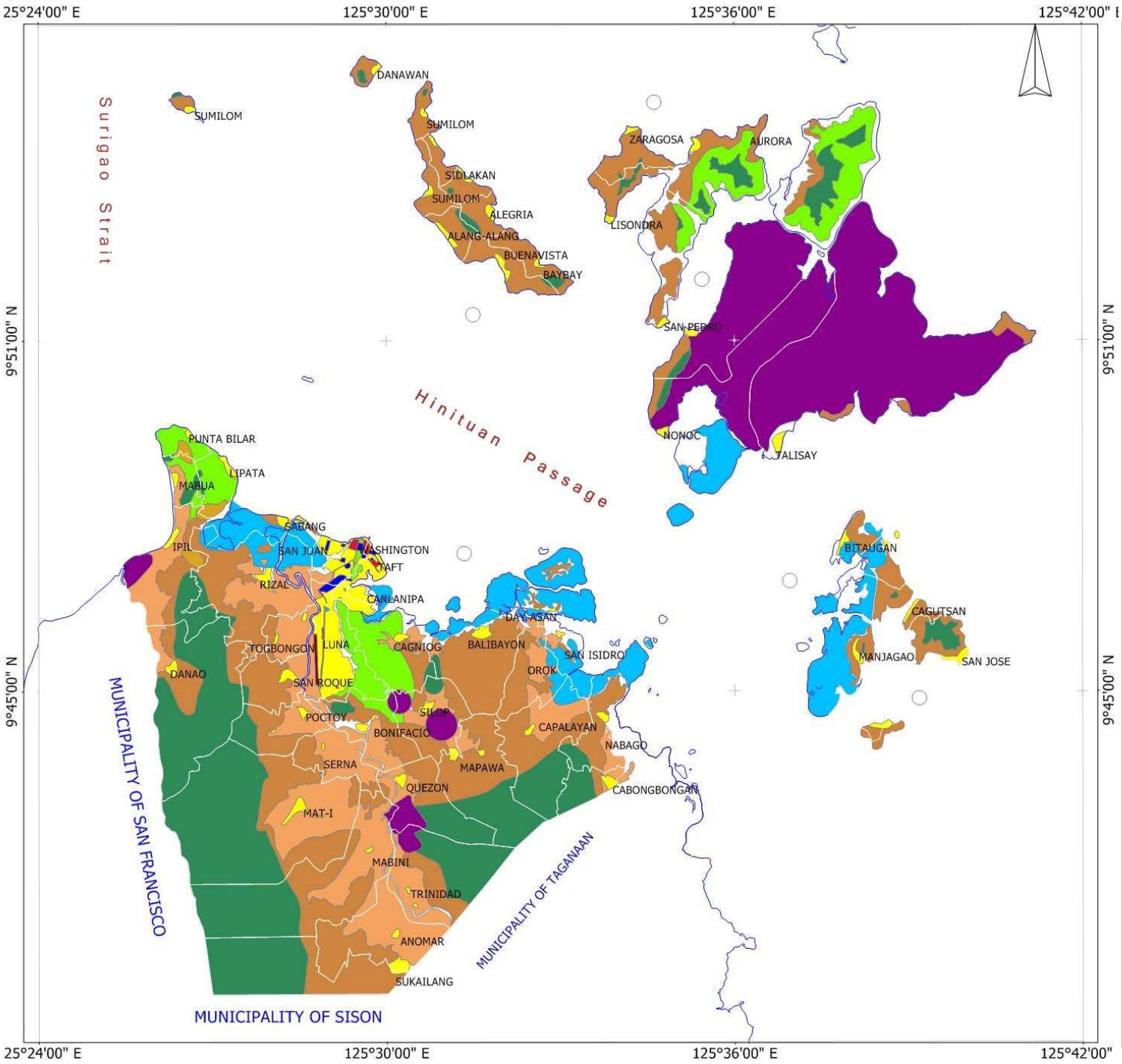
SLOPE MAP

LEGEND

- GENTLY SLOPING OR UNDULATING
- LEVEL TO NEARLY LEVEL ALLUVIAL PLAINS
- LEVEL TO NEARLY LEVEL MAMGROVES
- LEVEL TO NEARLY LEVEL MANGROVES
- MODERATELY SLOPING OR ROLLING
- STEEP OR HILLY
- STRONGLY SLOPING OR STRONGLY ROLLING
- VERY GENTLY SLOPING OR GENTLY UNDULATING
- VERY STEEP OR STEEP HILLY MOUNTAIN LAND OR ROUGH RUGGED MOUNTAIN AREAS
- City/Municipal Boundary
- Coastline
- River
- Barangay Boundaries
- Contour Index
- Contour Intermediate
- Contour Main

CITY PLANNING AND DEVELOPMENT OFFICE GIS (SLOPE MAP) 2012
Source: Namria, Bureau of Soils and CPDO


125°30'00" E
125°36'00" E
125°42'00" E
9°56'24" N
9°51'00" N
9°45'00" N
9°39'00" N
DINAGAT ISLAND
Surigao Strait
Hinituan Passage
MUNICIPALITY OF SAN FRANCISCO
MUNICIPALITY OF TAGANAAN
MUNICIPALITY OF SISON
Data Source: Bureau of Soils
Transverse Mercator
Lon: 125°33.167' E
Lat: 9°47.637' N
Printed at: 10/28/2013
CITY OF SURIGAO
SEMI-DETAILED SOIL MAP
0
5 km
Scale 1:160000 m
LEGEND
Semi-Detailed Soil Map
AnAfI
FaD/E2
FaF/G2
FacG2
KbC/D2
KbE/G2
KbE2
MgvA
MoF/G2
MoG2
SgE/F2
SiB/C2
SiD/E2
SiE/F2
SiG2
Sib2
Sm/AgAfI
SmvAfI
TFf3
Road Network
Barangay Boundary
City/Municipal Boundary
Coastline
Rivers / Creeks



CITY OF SURIGAO

SAFDZ MAP

(Strategic Agriculture and Fisheries Development Zone)

0 5 km

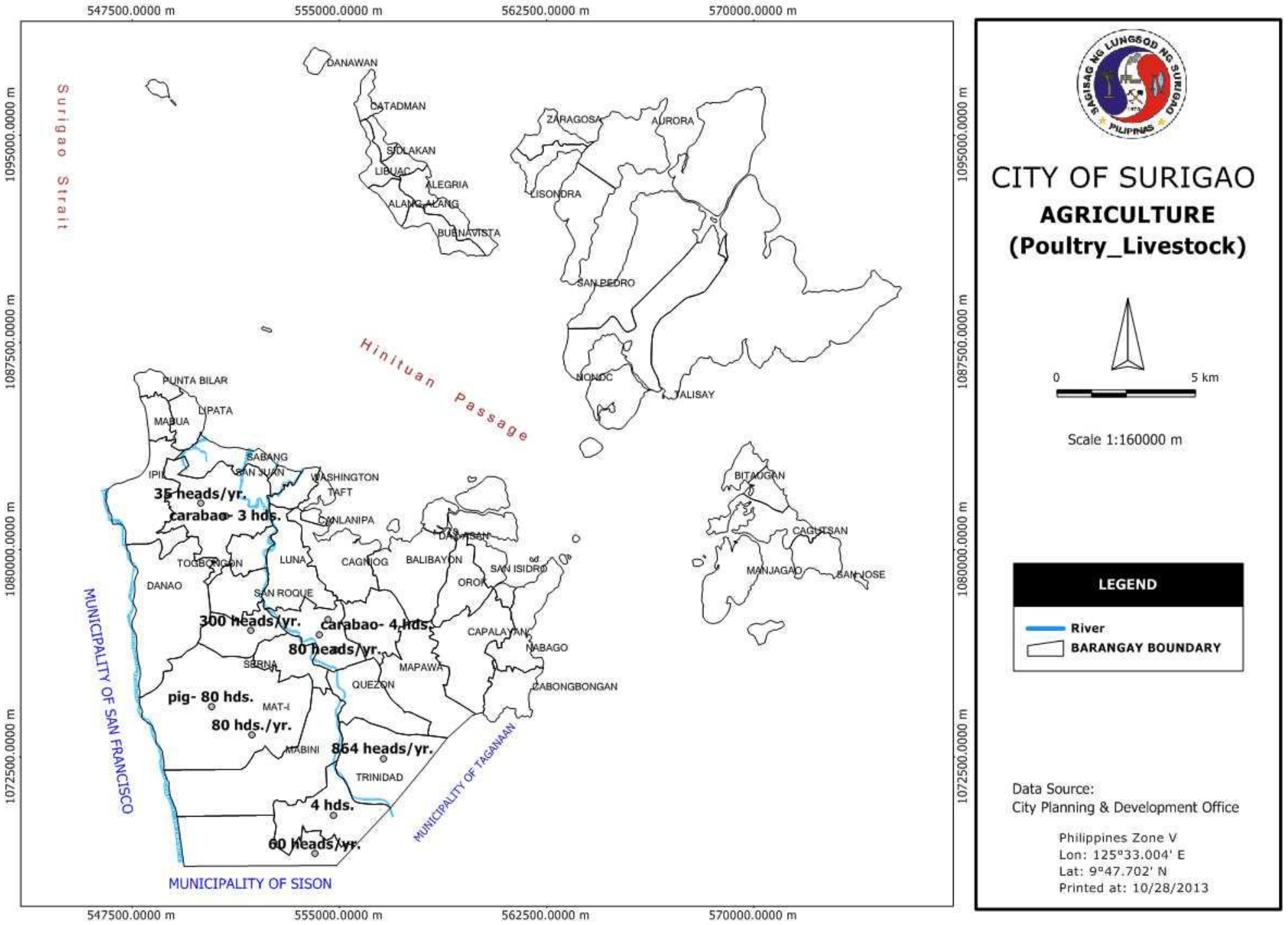
Scale 1:160000 m

LEGEND

- Barangay Boundaries
- Coastline
- River
- AGRO-FORESTRY ZONE
- COMMERCIAL AREA
- FISH SANCTUARY
- FORESTRY ZONE
- INDUSTRIAL AREA
- INSTITUTIONAL AREA
- PARKS & OPEN SPACE
- RESIDENTIAL AREA
- STRATEGIC CROP SUB-DEVELOPMENT ZONE
- SWAMP AREA
- UTILITY

Data Source:
City Agriculture Office

Philippines Zone V
Lon: 125°33.004' E
Lat: 9°47.703' N
Printed at: 3/26/2011



CITY OF SURIGAO

AGRICULTURE (Poultry_Livestock)

0 5 km

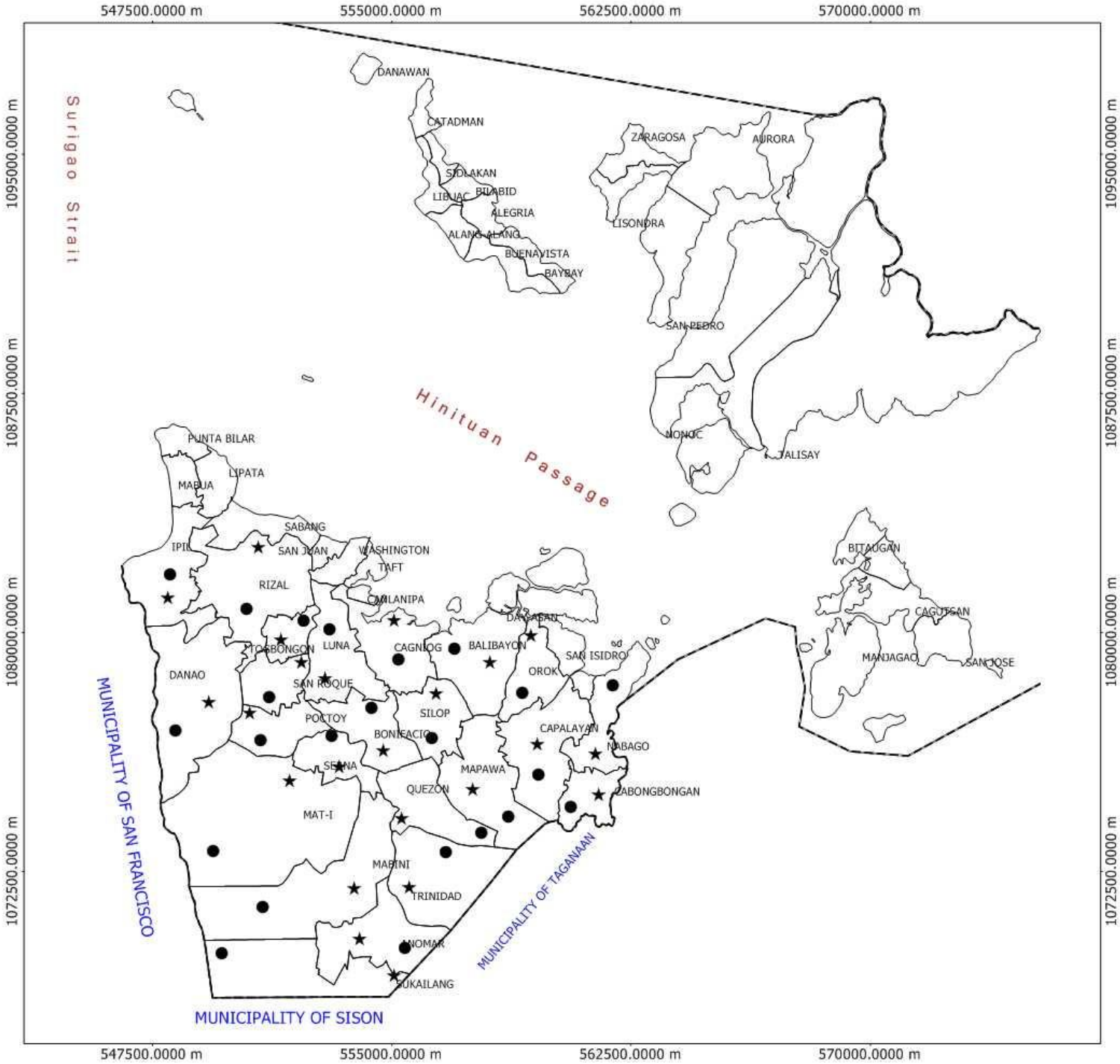
Scale 1:160000 m

LEGEND

- River
- BARANGAY BOUNDARY

Data Source:
City Planning & Development Office

Philippines Zone V
Lon: 125°33.004' E
Lat: 9°47.702' N
Printed at: 10/28/2013



CITY OF SURIGAO

AGRICULTURE - CROP

0 5 km

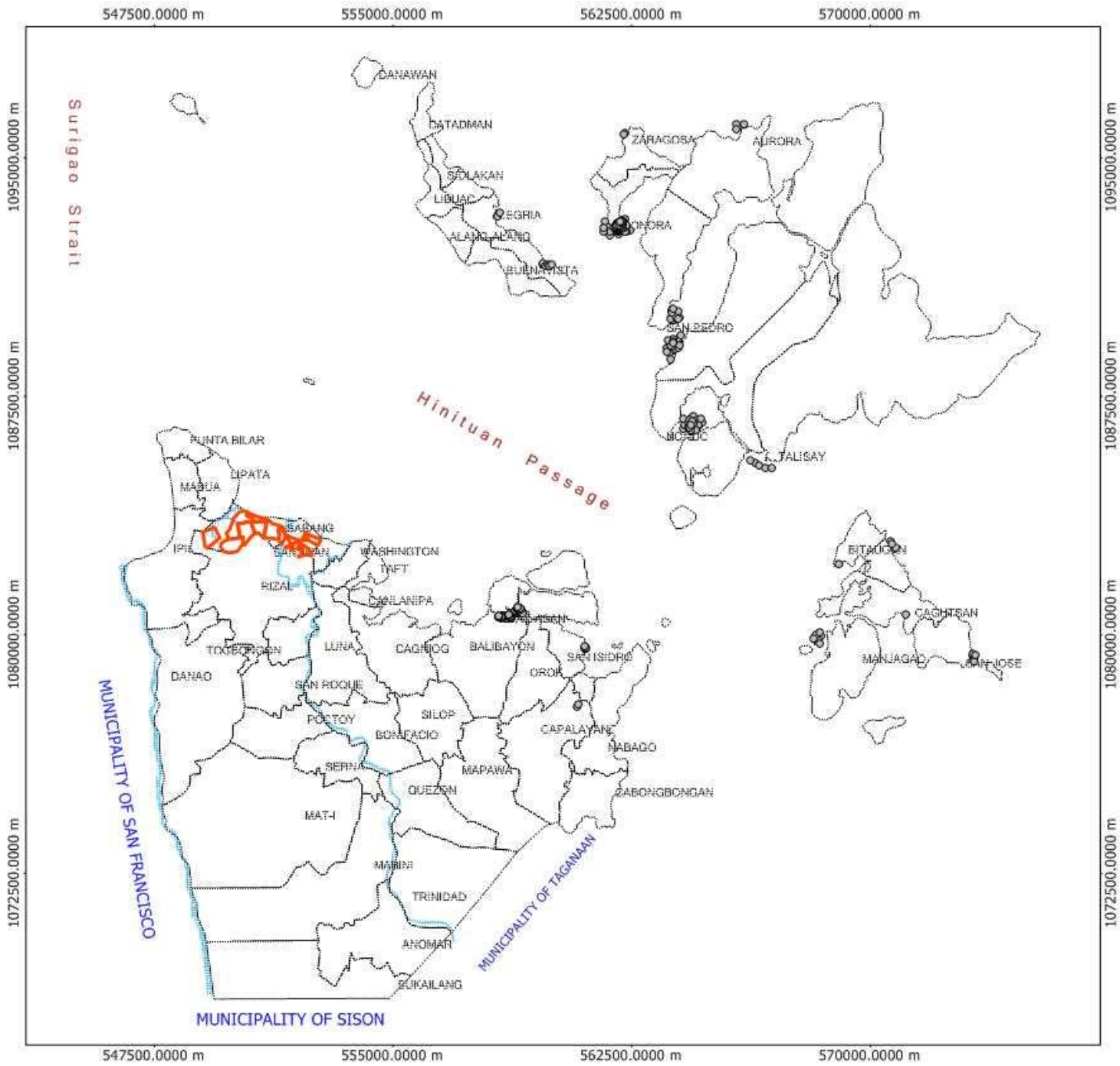
Scale 1:160000 m

LEGEND

- Rice Non-Irrigated
- Rice-Irrigated
- **River**
- **BARANGAY BOUNDARY**

Data Source:
City Planning & Development Office

Philippines Zone V
Lon: 125°33.004' E
Lat: 9°47.702' N
Printed at: 4/12/2011



CITY OF SURIGAO

AGRICULTURE (Aquaculture)

0 5 km

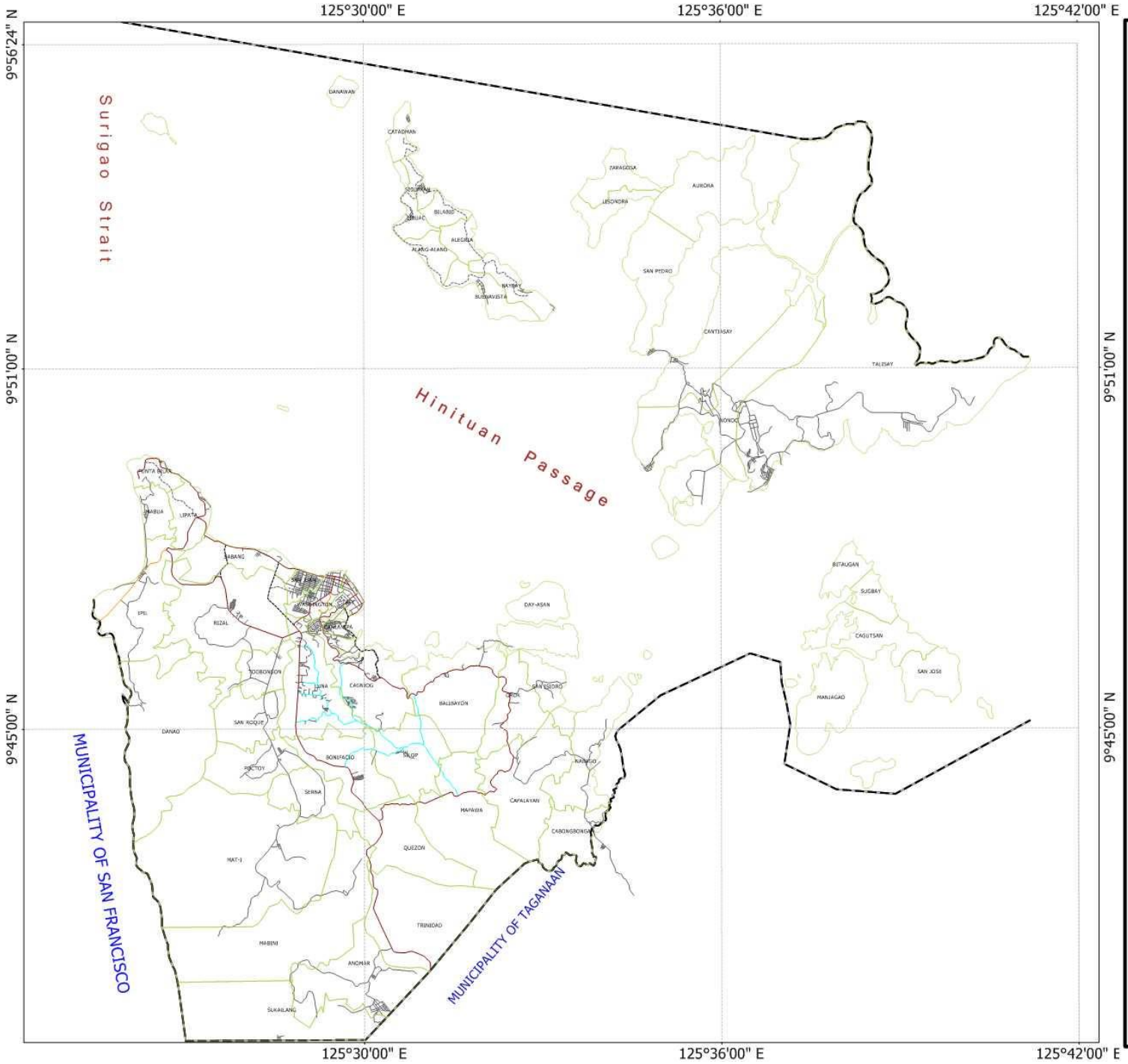
Scale 1:160000 m

LEGEND

- FISHPONDS
- FISHPENS
- BARANGAY BOUNDARY

Data Source:
City Planning & Development Office

Philippines Zone V
Lon: 125°33.004' E
Lat: 9°47.702' N
Printed at: 2/21/2014



SAGISAG NG LUNGSOD NG SURIGAO
PILIPINAS

CITY OF SURIGAO

ROAD NETWORK MAP

N
W E
S

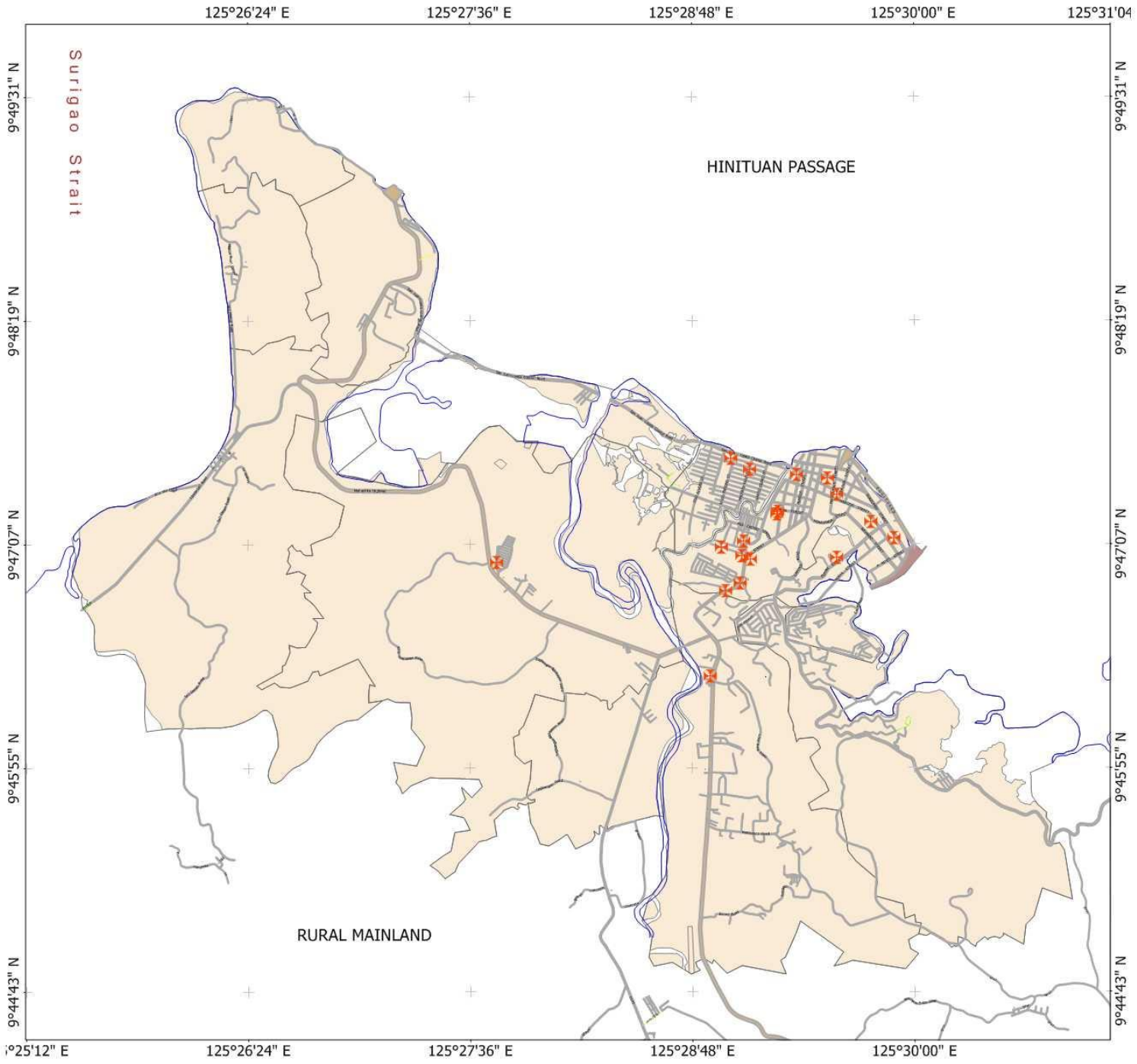
Scale 1:160000 m
0 5 km

LEGEND

- CITY/BRGY ROAD
- Proposed Arterial Road (City Road)
- National Road
- Island Barangay Road
- Provincial Road
- Proposed Arterial Road (National Road)
- Proposed Roads

Philippines Zone V
Lon: 125°33.319' E
Lat: 9°48.270' N
Printed at: 1/16/2014

Data Source:
City Planning and Development Office.



SAGISAG NG LUNGSOD NG SURIGAO
1970
PILIPINAS

CITY OF SURIGAO

FACILITIES MAP (Churches)

0 2 km

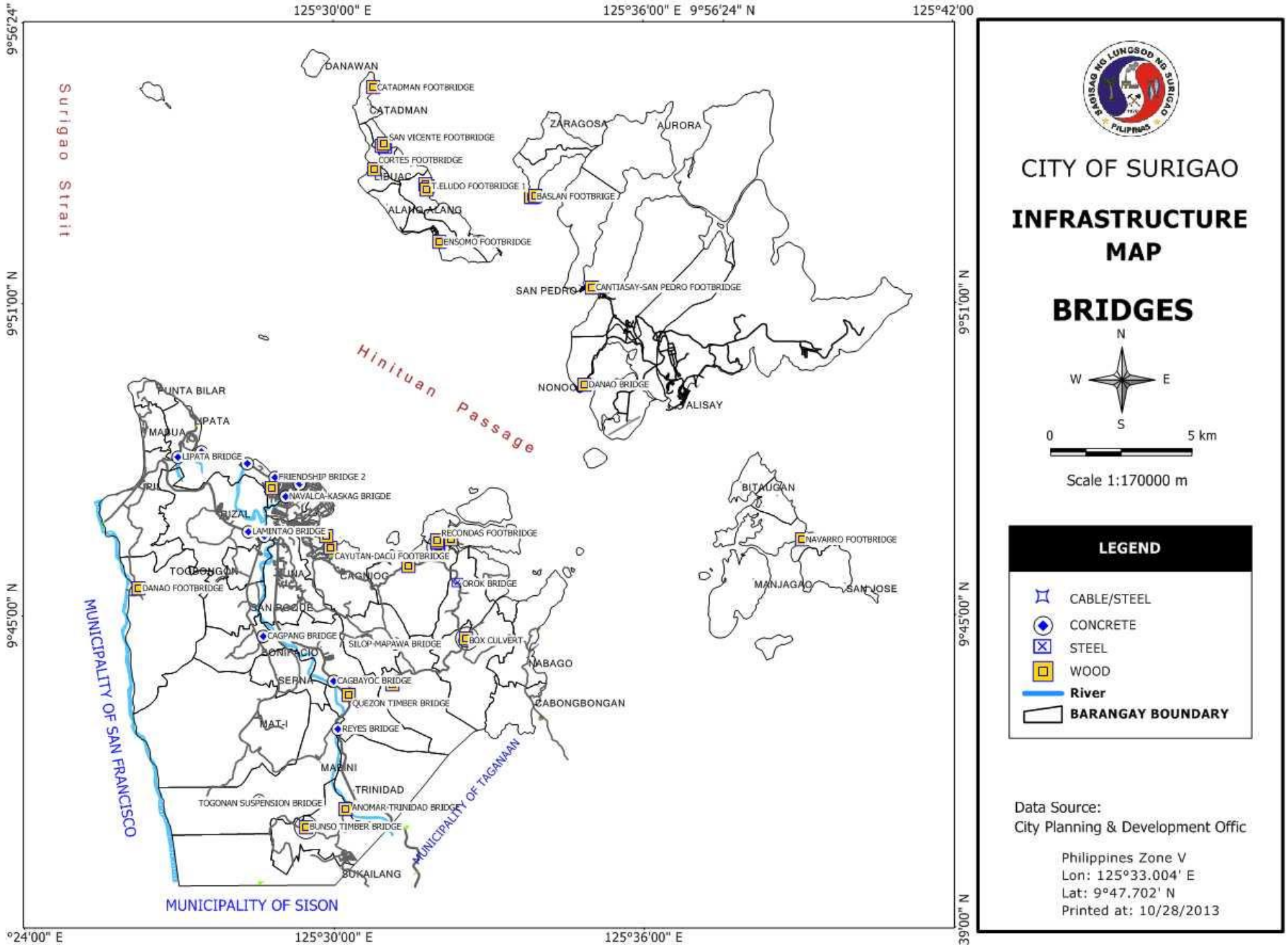
Scale 1:50000 m

LEGEND

- Church Location
- Road Network
- Coastline
- River

Data Source:
City Planning
and Development Office.

Philippines Zone V
Lon: 125°28.137' E
Lat: 9°47.186' N
Printed at: 3/26/2011



CITY OF SURIGAO

INFRASTRUCTURE MAP

BRIDGES

N
W E
S

0 5 km

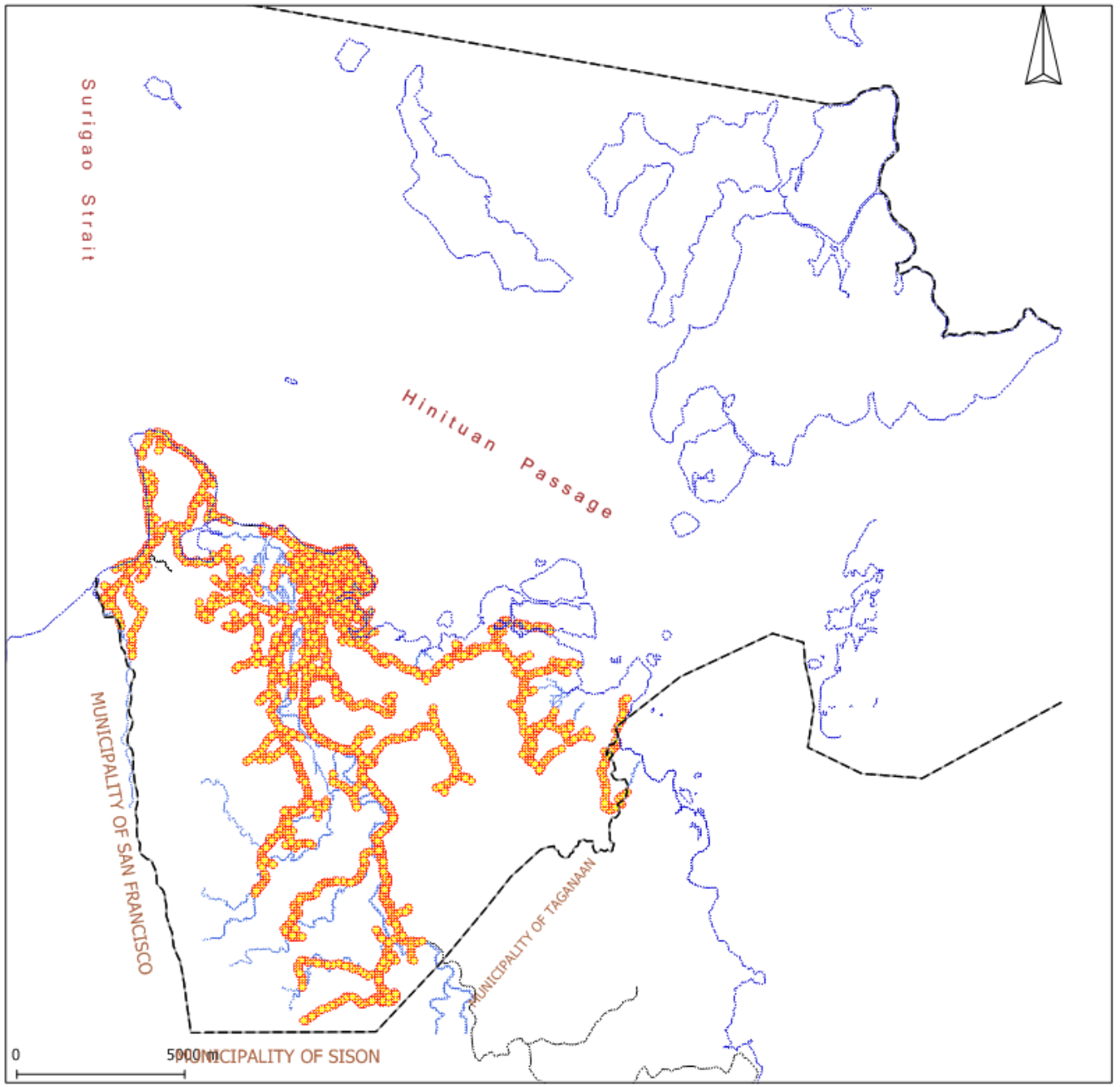
Scale 1:170000 m

LEGEND

- CABLE/STEEL
- CONCRETE
- STEEL
- WOOD
- River
- BARANGAY BOUNDARY

Data Source:
City Planning & Development Offic

Philippines Zone V
Lon: 125°33.004' E
Lat: 9°47.702' N
Printed at: 10/28/2013



CITY OF SURIGAO

INFRASTRUCTURE MAP (POWER)

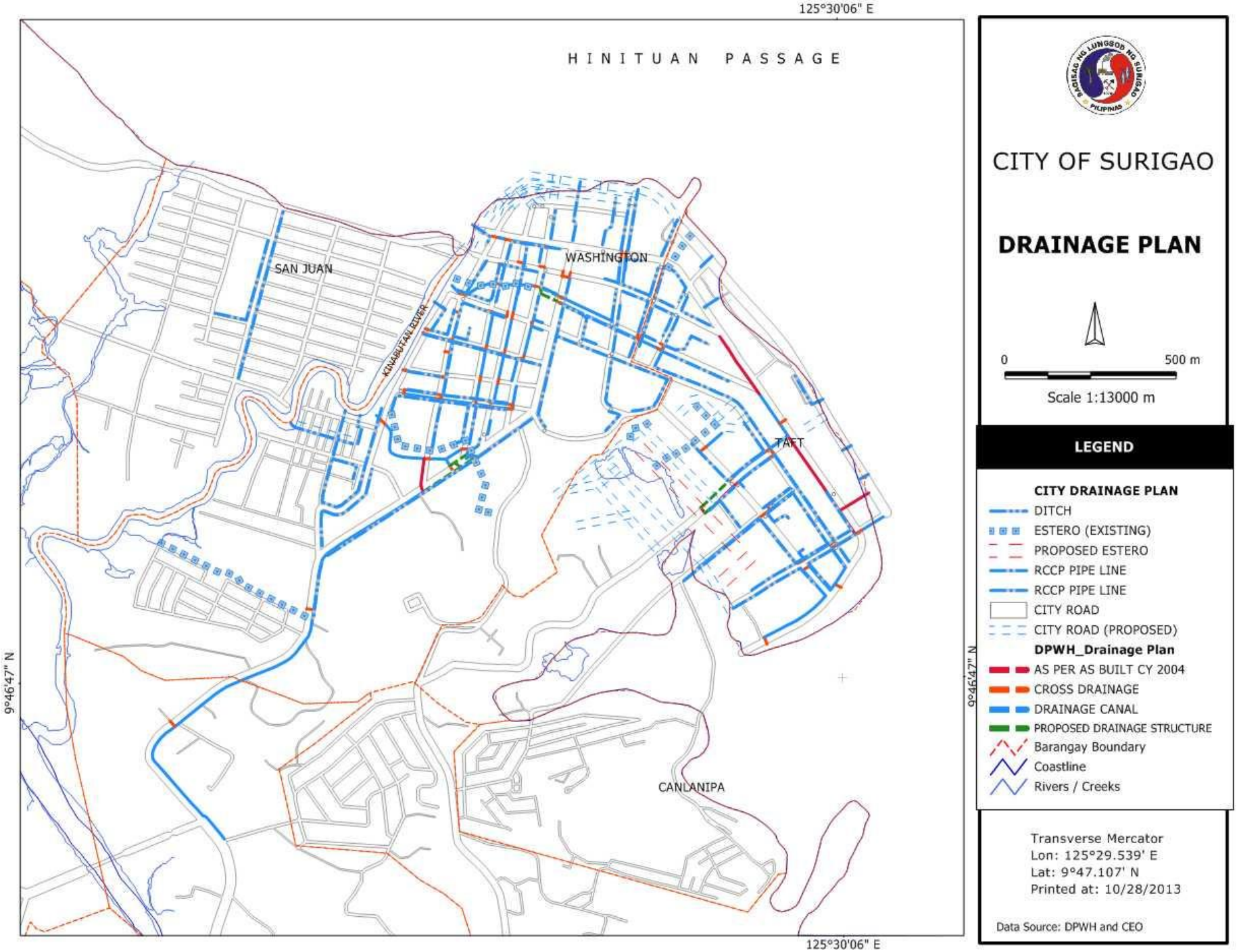
0 5000 m

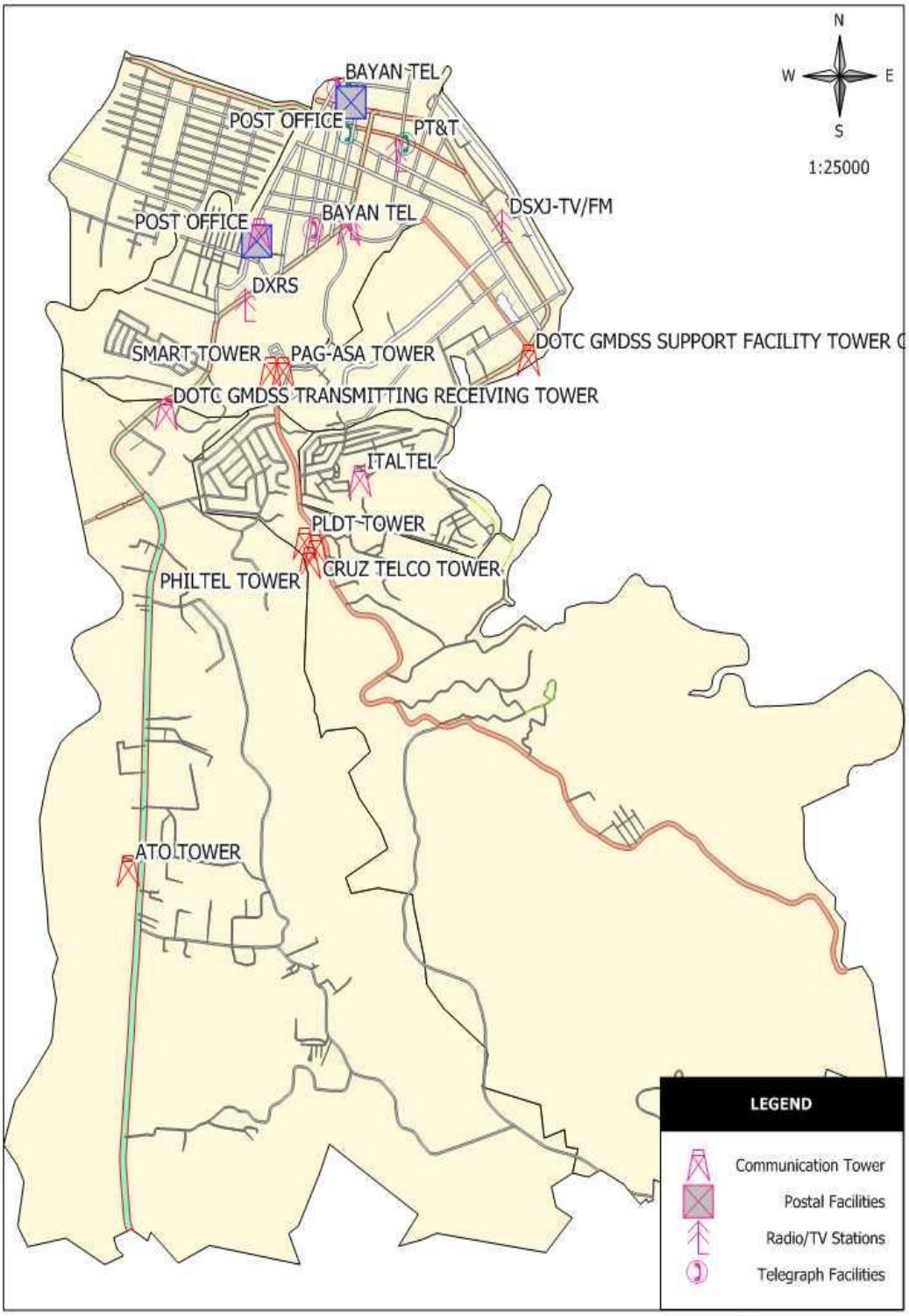
1:170000

LEGEND

- Rivers/Creeks
- City / Municipal Boundary
- Electric Posts

Philippines Zone V
Lon: 125°33.004' E
Lat: 9°47.702' N
Printed at: 2/21/2014

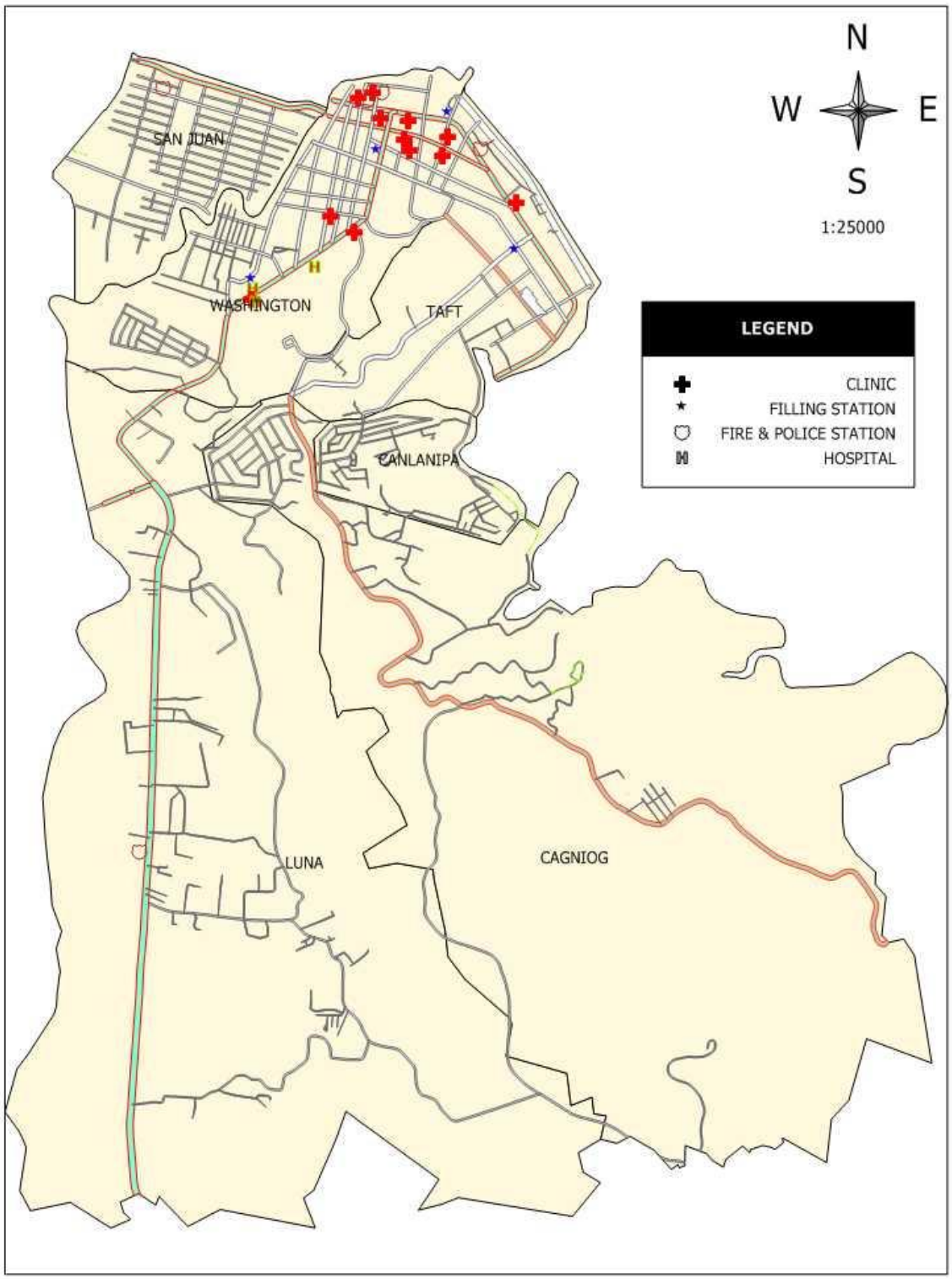

125°30'06" E
HINITUAN PASSAGE
SAN JUAN
WASHINGTON
KINABUTAAN RIVER
TAFT
CANLANIPA
9°46'47" N
125°30'06" E
CITY OF SURIGAO
DRAINAGE PLAN
0
500 m
Scale 1:13000 m
LEGEND
CITY DRAINAGE PLAN
DITCH
ESTERO (EXISTING)
PROPOSED ESTERO
RCCP PIPE LINE
RCCP PIPE LINE
CITY ROAD
CITY ROAD (PROPOSED)
DPWH_Drainage Plan
AS PER AS BUILT CY 2004
CROSS DRAINAGE
DRAINAGE CANAL
PROPOSED DRAINAGE STRUCTURE
Barangay Boundary
Coastline
Rivers / Creeks
Transverse Mercator
Lon: 125°29.539' E
Lat: 9°47.107' N
Printed at: 10/28/2013
Data Source: DPWH and CEO



INFRASTRUCTURE MAP
OF SURIGAO CITY

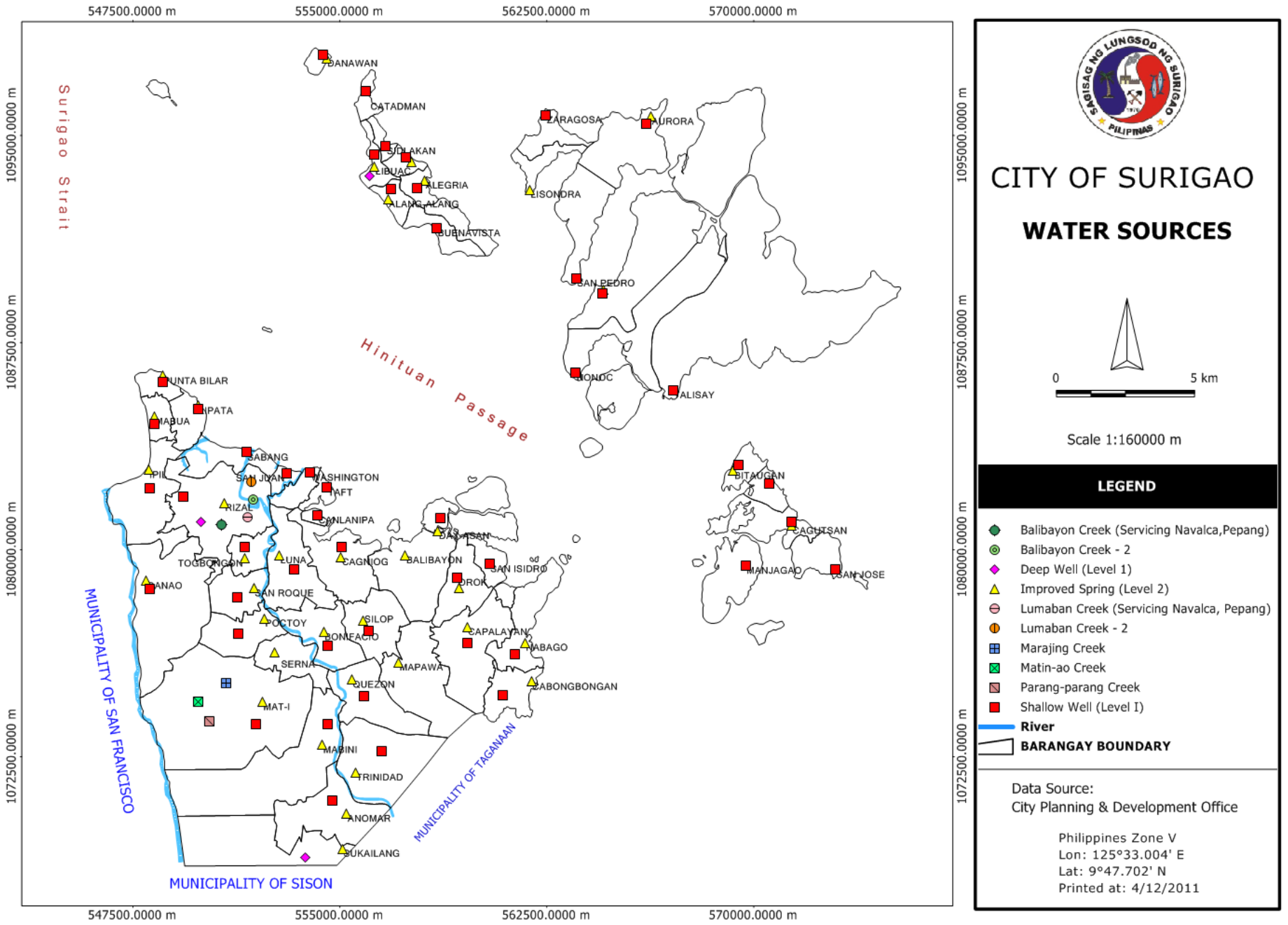
TELECOMMUNICATION

Philippines Zone V
Lon: 125°29.719' E
Lat: 9°46.248' N
Printed at: 2/21/2014



INFRASTRUCTURE MAP
OF SURIGAO CITY
FACILITIES

Philippines Zone V
Lon: 125°29.719' E
Lat: 9°46.248' N
Printed at: 2/21/2014



CITY OF SURIGAO

WATER SOURCES

0 5 km

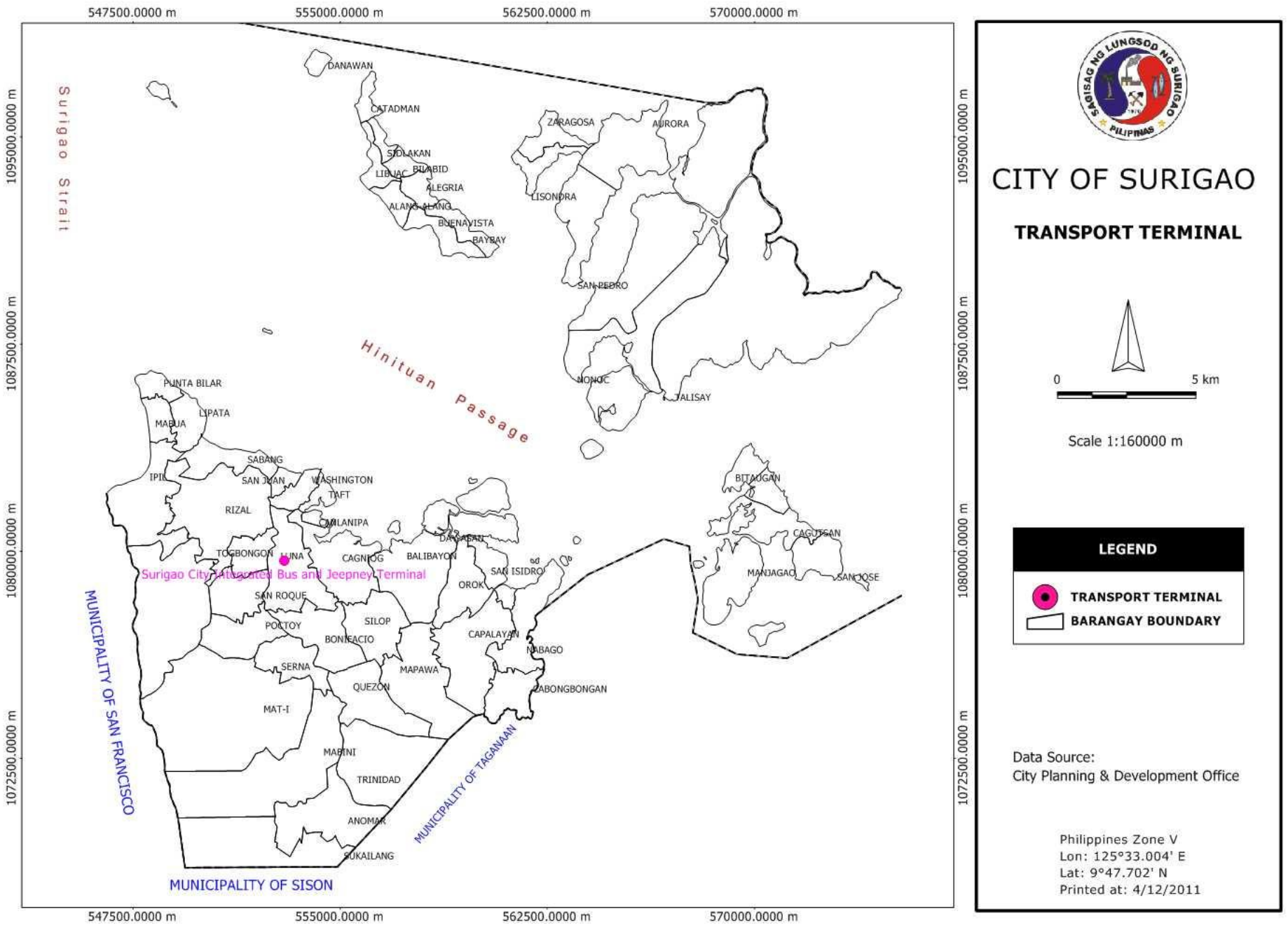
Scale 1:160000 m

LEGEND

- Balibayon Creek (Servicing Navalca,Pepang)
- Balibayon Creek - 2
- Deep Well (Level 1)
- Improved Spring (Level 2)
- Lumaban Creek (Servicing Navalca, Pepang)
- Lumaban Creek - 2
- Marajing Creek
- Matin-ao Creek
- Parang-parang Creek
- Shallow Well (Level I)
- **River**
- **BARANGAY BOUNDARY**

Data Source:
City Planning & Development Office

Philippines Zone V
Lon: 125°33.004' E
Lat: 9°47.702' N
Printed at: 4/12/2011



CITY OF SURIGAO

TRANSPORT TERMINAL

0 5 km

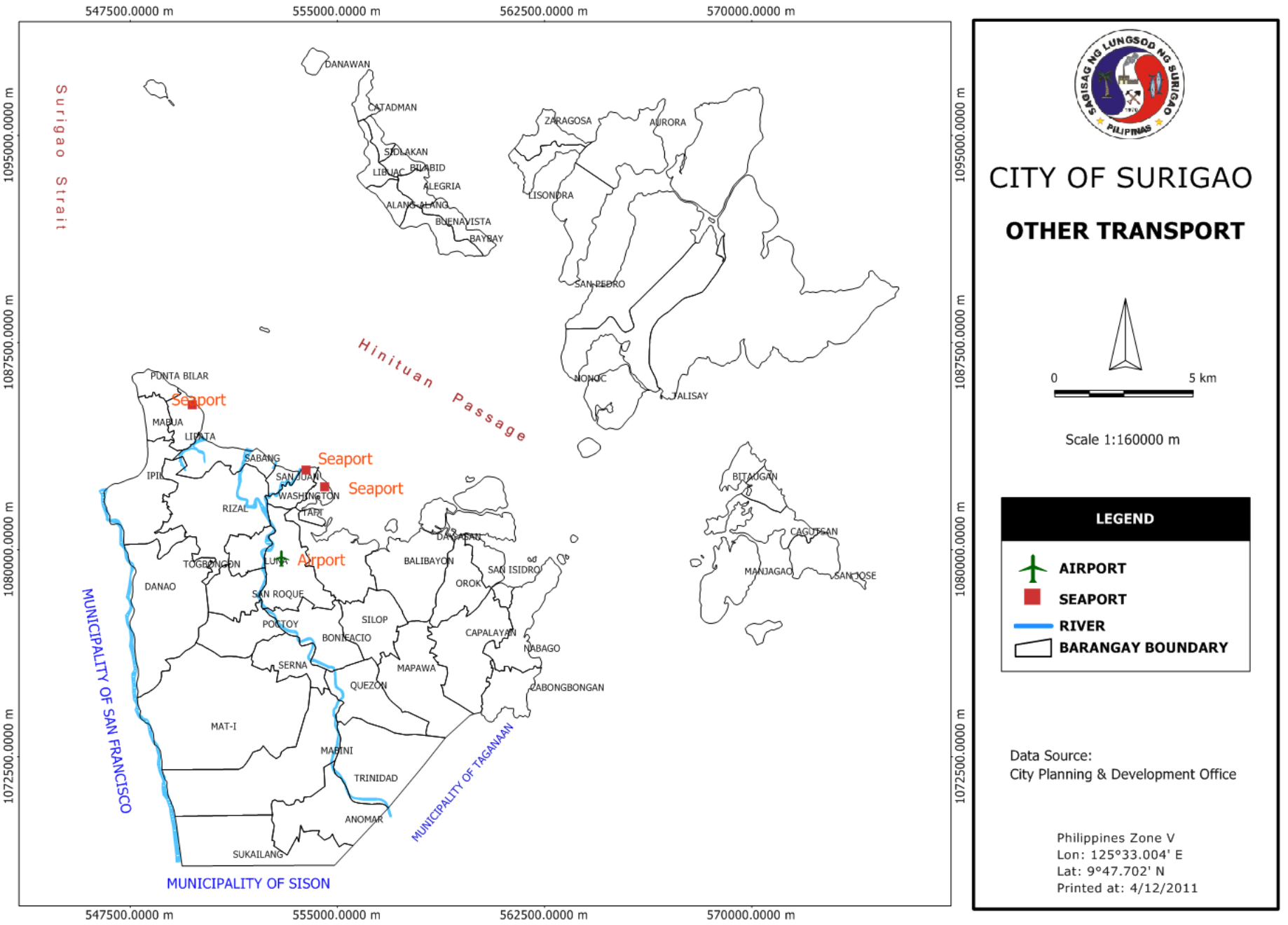
Scale 1:160000 m

LEGEND

- TRANSPORT TERMINAL
- BARANGAY BOUNDARY

Data Source:
City Planning & Development Office

Philippines Zone V
Lon: 125°33.004' E
Lat: 9°47.702' N
Printed at: 4/12/2011



CITY OF SURIGAO

OTHER TRANSPORT

0 5 km

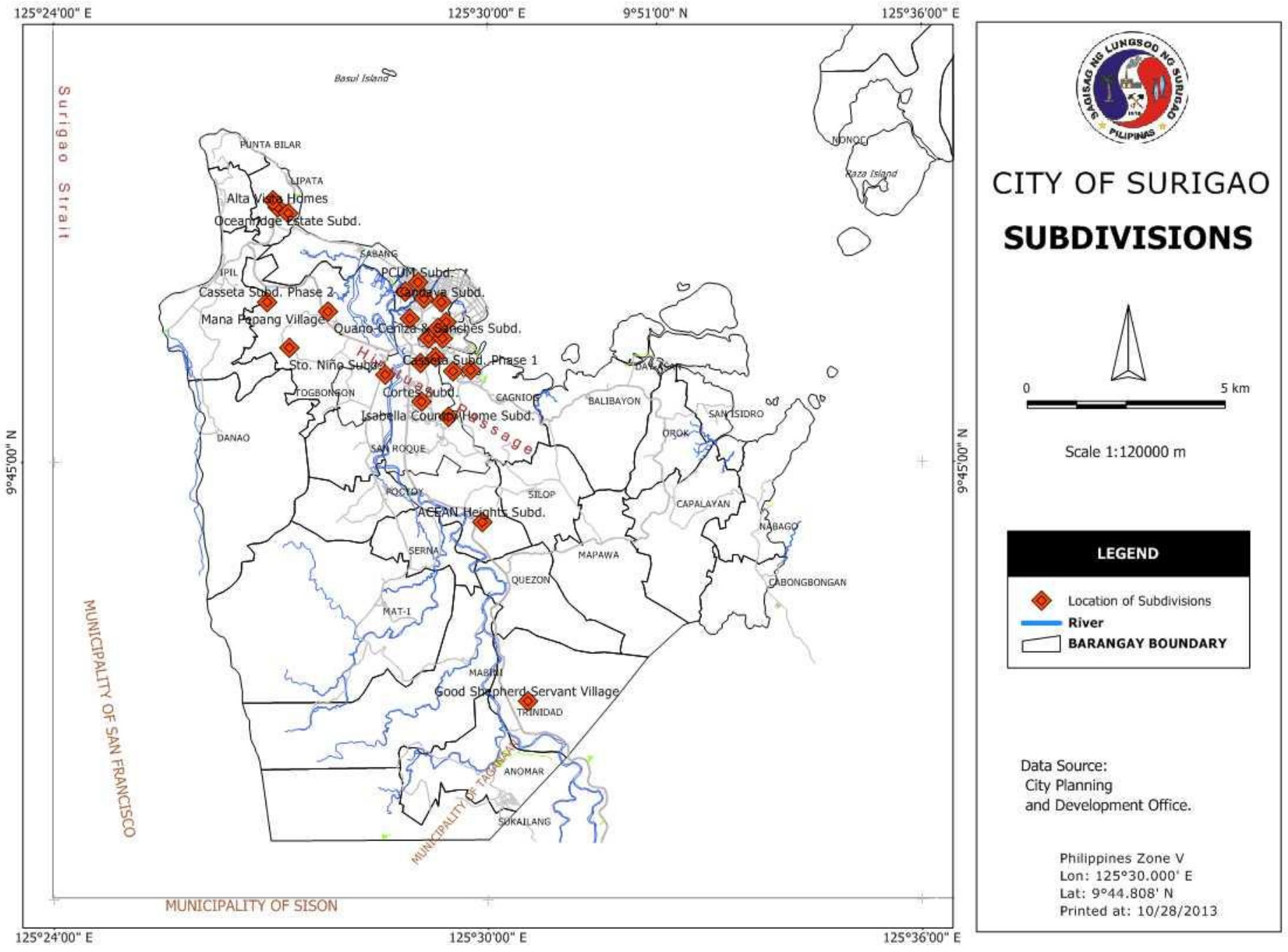
Scale 1:160000 m

LEGEND

- AIRPORT
- SEAPORT
- RIVER
- BARANGAY BOUNDARY

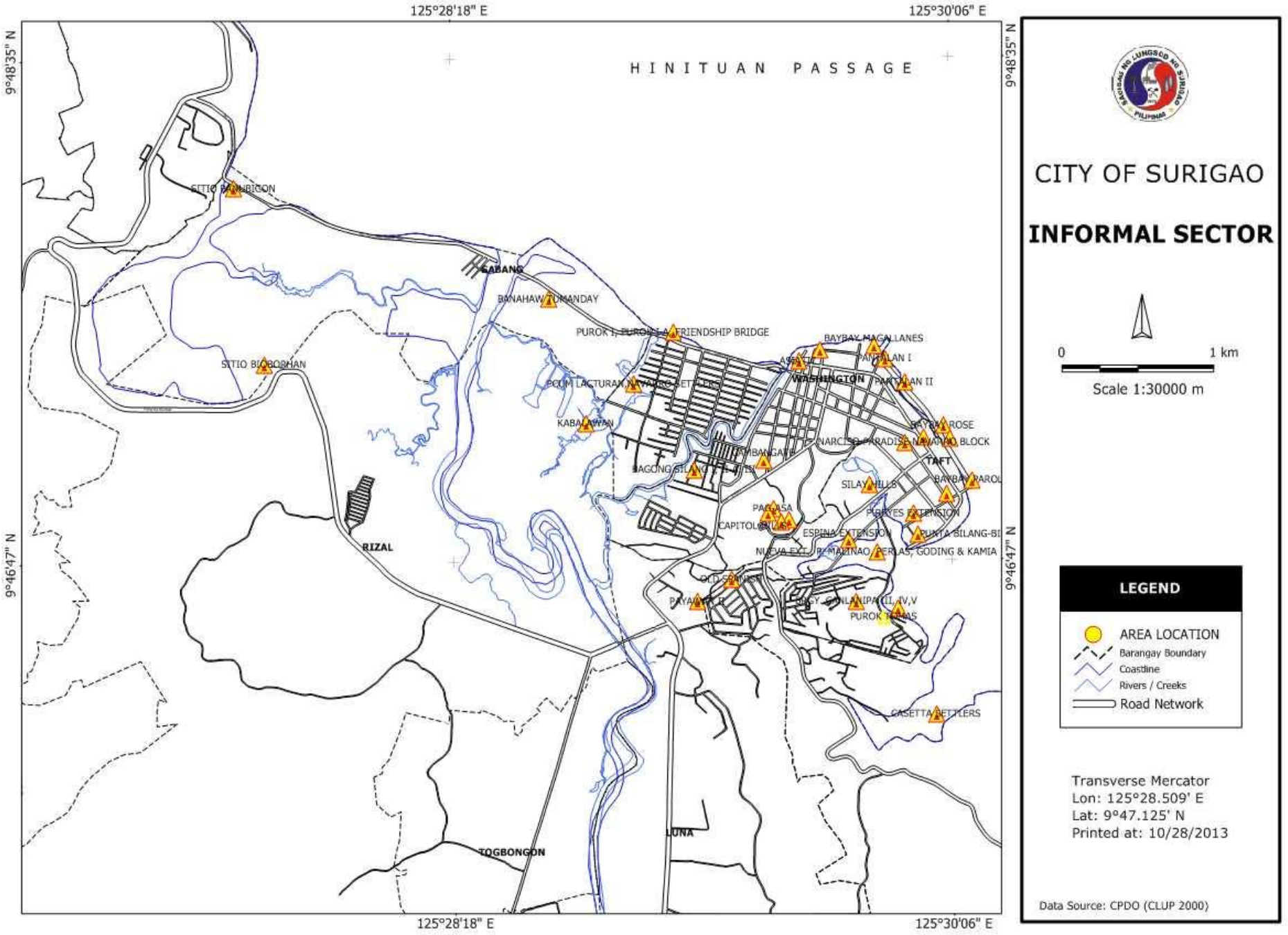
Data Source:
City Planning & Development Office

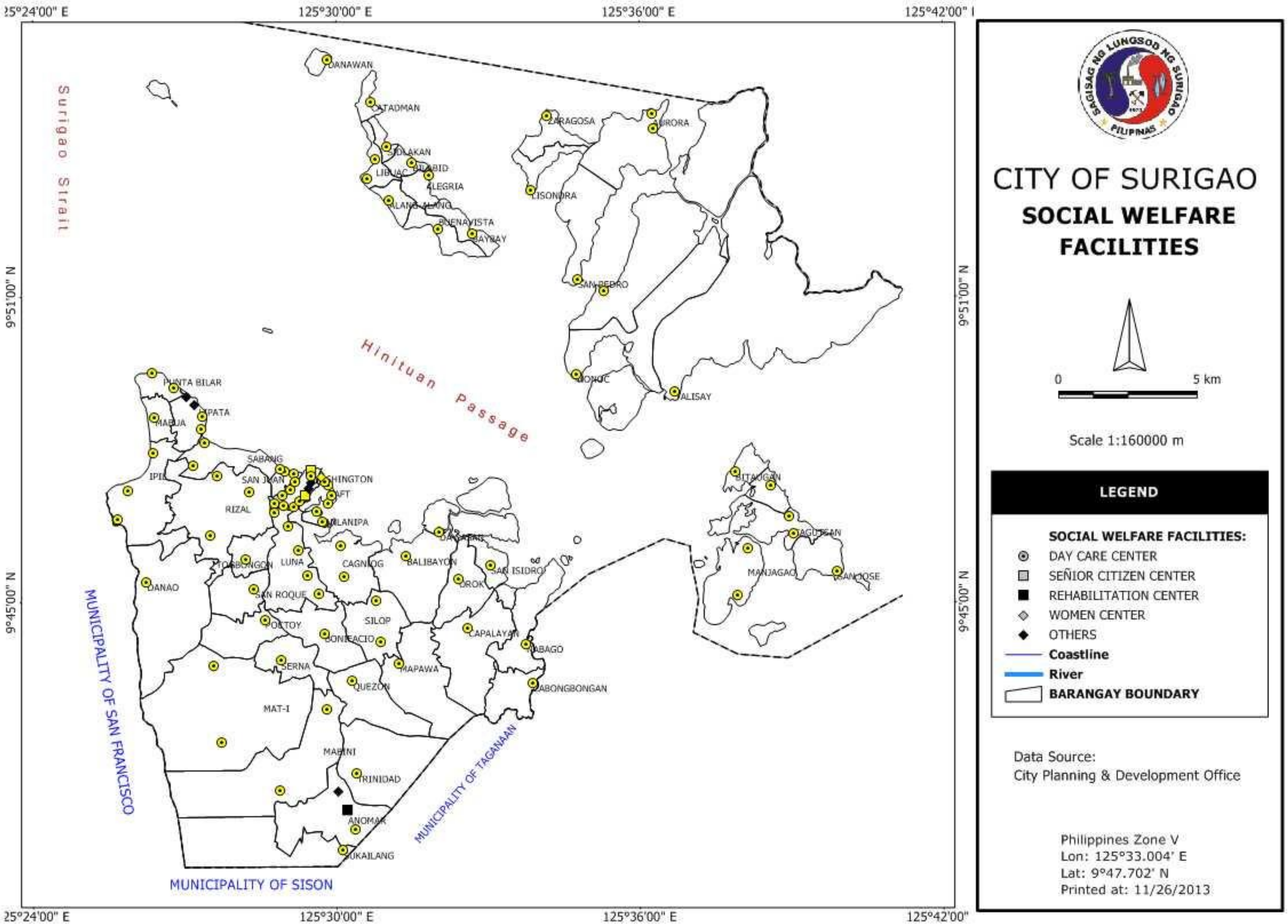
Philippines Zone V
Lon: 125°33.004' E
Lat: 9°47.702' N
Printed at: 4/12/2011



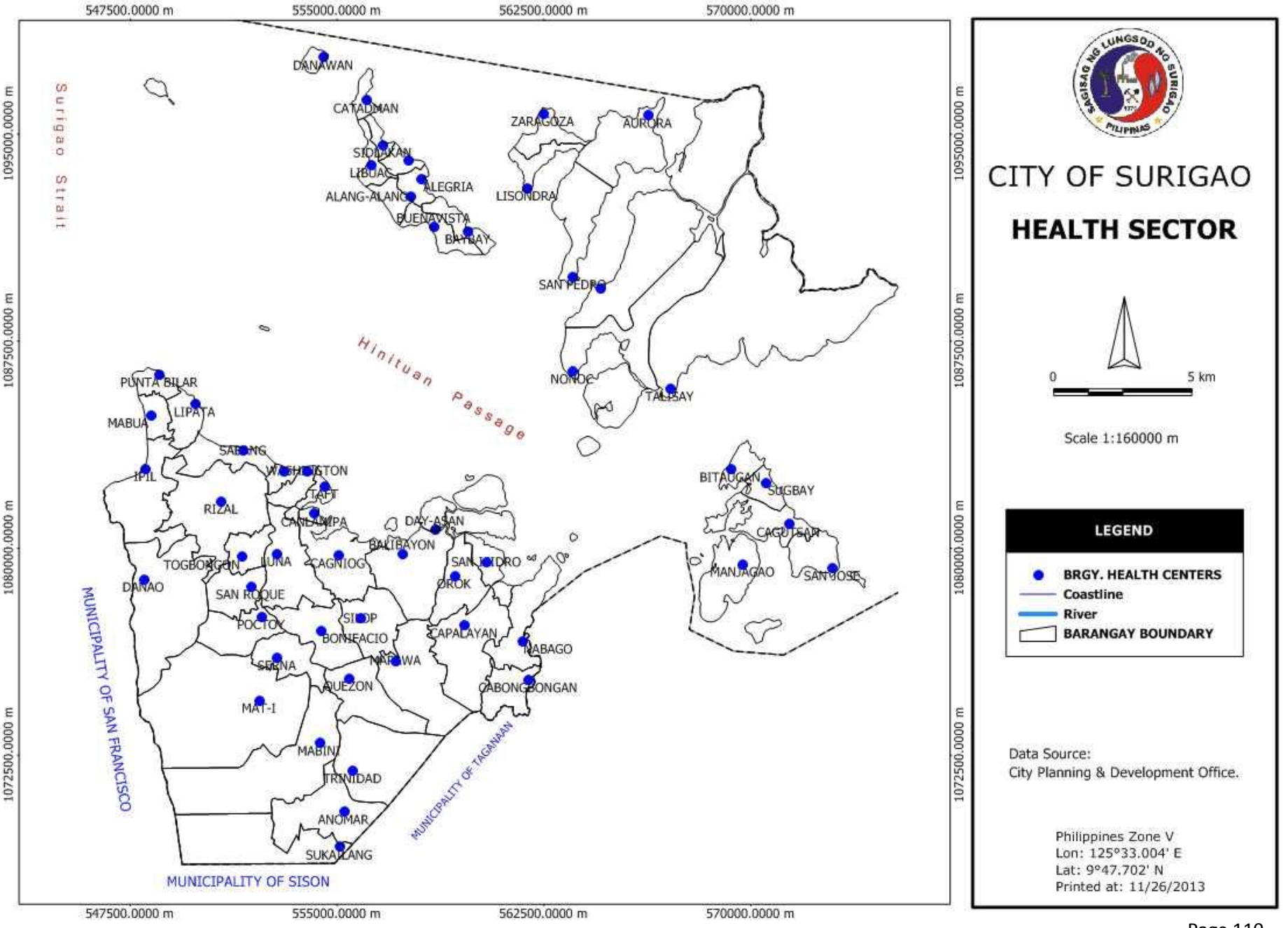
CITY OF SURIGAO

SUBDIVISIONS


125°28'18" E
125°30'06" E
9°48'35" N
9°46'47" N
HINITUAN PASSAGE
SITIO PANIBIGON
CABANG
BANAHAW-TOMANDAY
PUROK 1, PUROK 2 & FRIENDSHIP BRIDGE
SITIO BUBORHAN
PCCM LACTURAN NAVARRO SETTLERS
KABALAWAN
BAYBAY MAGALLANES
PARTILAN I
WASHINGTON
PARTILAN II
BAYBAY ROSE
TAFT
SILAY HILLS
PAGKASA
CAPITOL HILLS
ESPINA EXTENSION
PUNTA SILANG-BI
NUEVA EXT.
GODING & KAMIA
PUROK TAMAS
CASETTA SETTLERS
RIZAL
LUNA
TOGBONGON
CITY OF SURIGAO
INFORMAL SECTOR
0
1 km
Scale 1:30000 m
LEGEND
AREA LOCATION
Barangay Boundary
Coastline
Rivers / Creeks
Road Network
Transverse Mercator
Lon: 125°28.509' E
Lat: 9°47.125' N
Printed at: 10/28/2013
Data Source: CPDO (CLUP 2000)



CITY OF SURIGAO
SOCIAL WELFARE FACILITIES
0
5 km
Scale 1:160000 m
LEGEND
SOCIAL WELFARE FACILITIES:
DAY CARE CENTER
SEÑIOR CITIZEN CENTER
REHABILITATION CENTER
WOMEN CENTER
OTHERS
Coastline
River
BARANGAY BOUNDARY
Data Source:
City Planning & Development Office
Philippines Zone V
Lon: 125°33.004' E
Lat: 9°47.702' N
Printed at: 11/26/2013
125°30'00" E
125°36'00" E
9°51'00" N
9°45'00" N
Surigao Strait
Hinituan Passage
MUNICIPALITY OF SAN FRANCISCO
MUNICIPALITY OF SISON
MUNICIPALITY OF TAGANAAN
CATADMAN
ALEGRIA
BUENAVISTA
ZARAGOSA
SAN PEDRO
ALISAY
PUNTA BILAR
IPIL
RIZAL
LUNA
CAGNIOG
BALIBAYON
SAN ISIDRO
SAN ROQUE
SILOP
CAPALAYAN
MAPAWA
QUEZON
MAT-I
TRINIDAD
DANAO
MANJAGAO
SAN JOSE
SABANG
SAN JUAN
CABONGBONGAN



CITY OF SURIGAO

HEALTH SECTOR

0 5 km

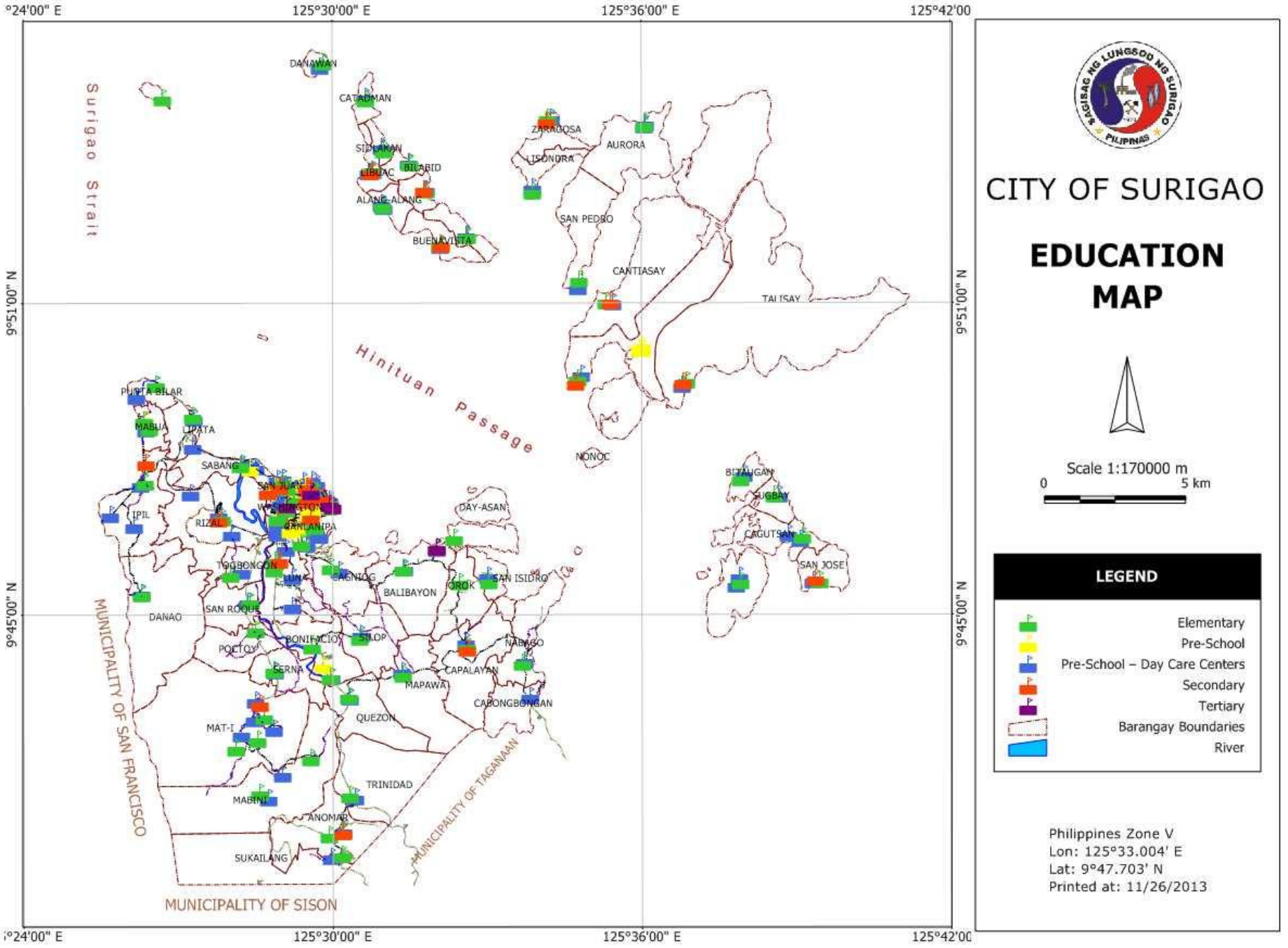
Scale 1:160000 m

LEGEND

- BRGY. HEALTH CENTERS
- Coastline
- River
- BARANGAY BOUNDARY

Data Source:
City Planning & Development Office.

Philippines Zone V
Lon: 125°33.004' E
Lat: 9°47.702' N
Printed at: 11/26/2013



CITY OF SURIGAO

EDUCATION MAP

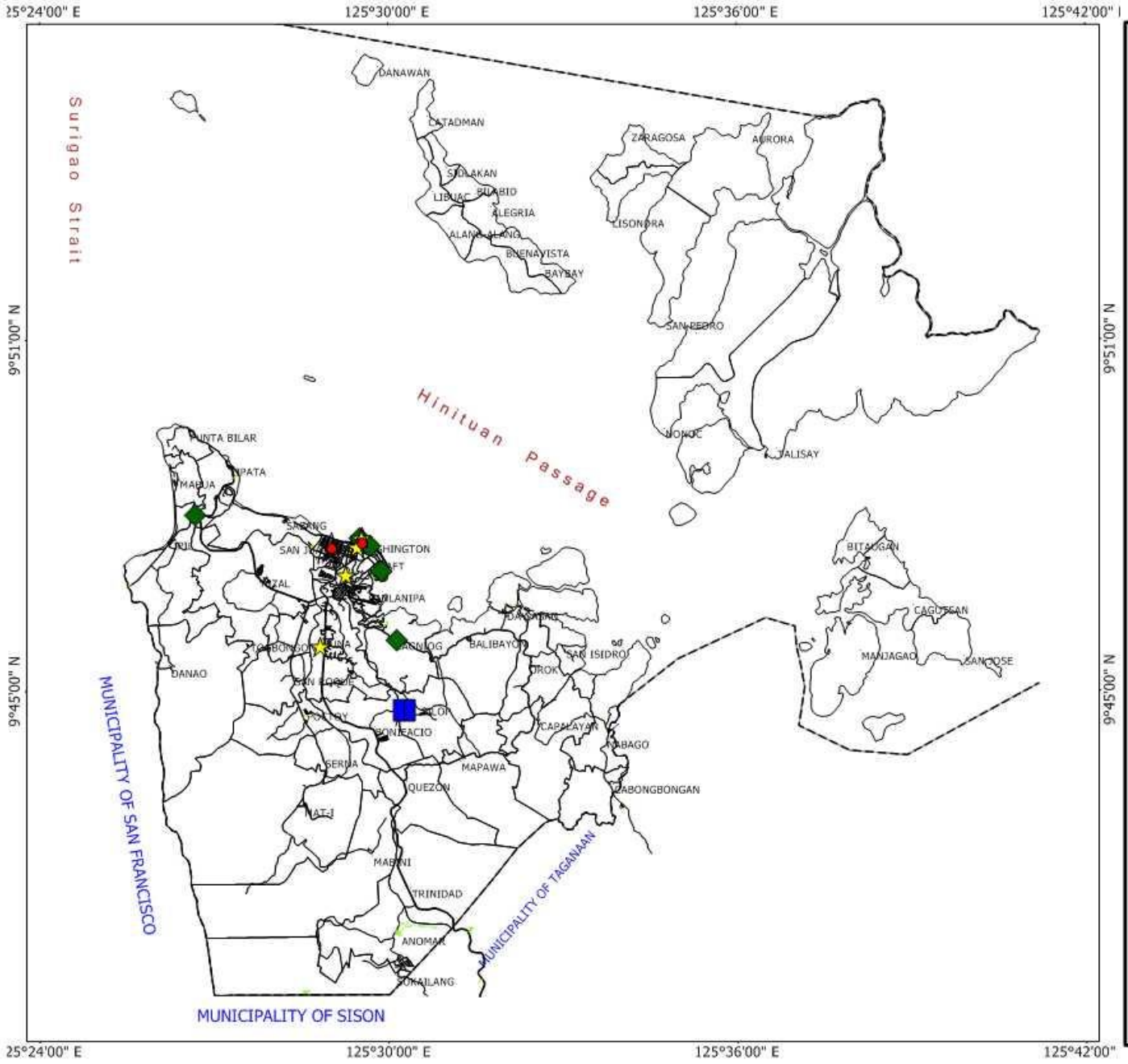
Scale 1:170000 m

0 5 km

LEGEND

- Elementary
- Pre-School
- Pre-School – Day Care Centers
- Secondary
- Tertiary
- Barangay Boundaries
- River

Philippines Zone V
Lon: 125°33.004' E
Lat: 9°47.703' N
Printed at: 11/26/2013



CITY OF SURIGAO

PROTECTIVE SERVICES

0 5 km

Scale 1:160000 m

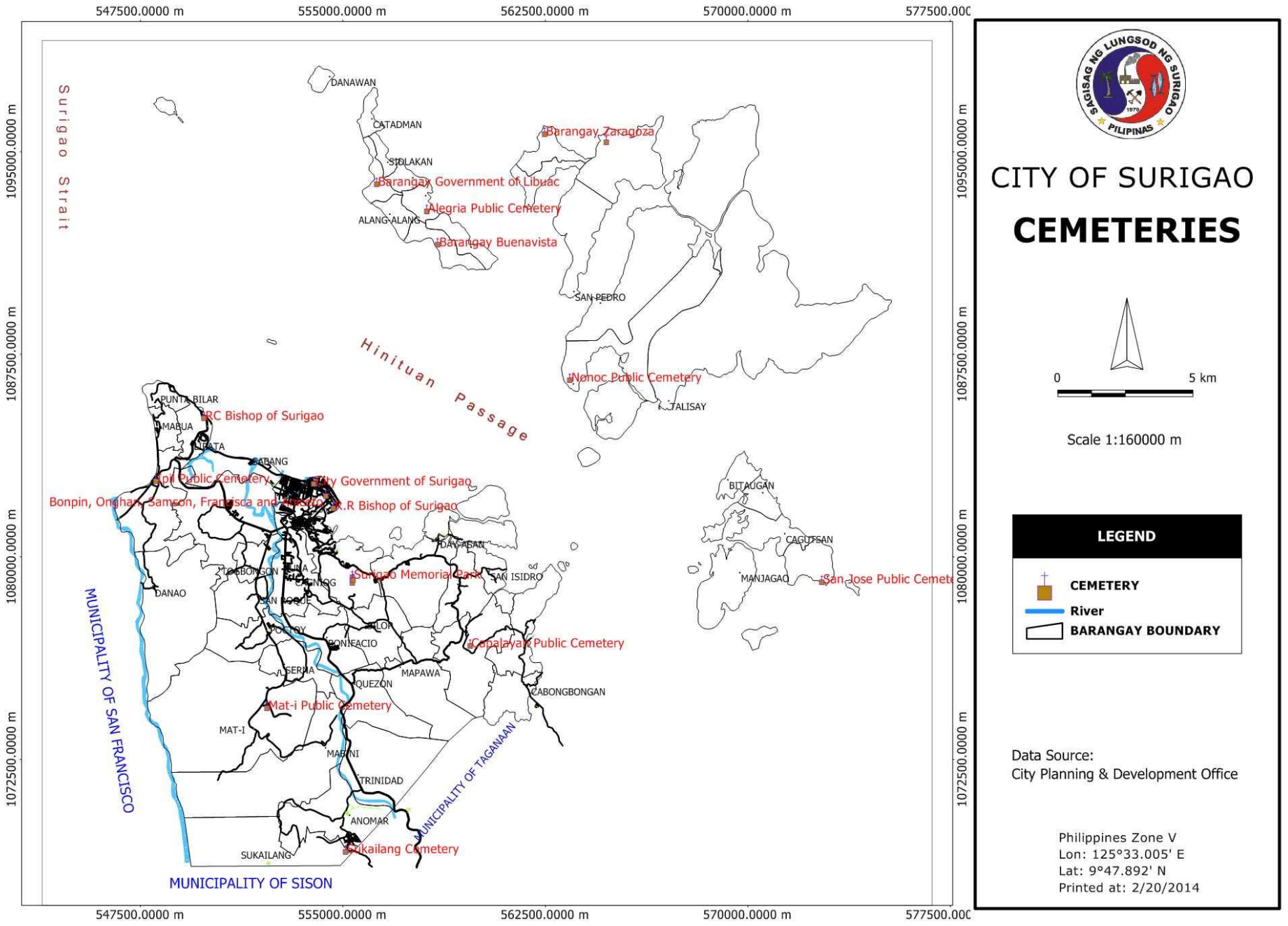
LEGEND

PROTECTIVE SERVICES:

- Fire Protection
- Jail Management
- Other support unit
- Police
- **Coastline**
- **River**
- **BARANGAY BOUNDARY**

Data Source:
City Planning & Development Office

Philippines Zone V
Lon: 125°33.004' E
Lat: 9°47.702' N
Printed at: 11/26/2013



SAGISAG NG LUNGSOD NG SURIGAO
1970
PILIPINAS

CITY OF SURIGAO

CEMETERIES

0 5 km

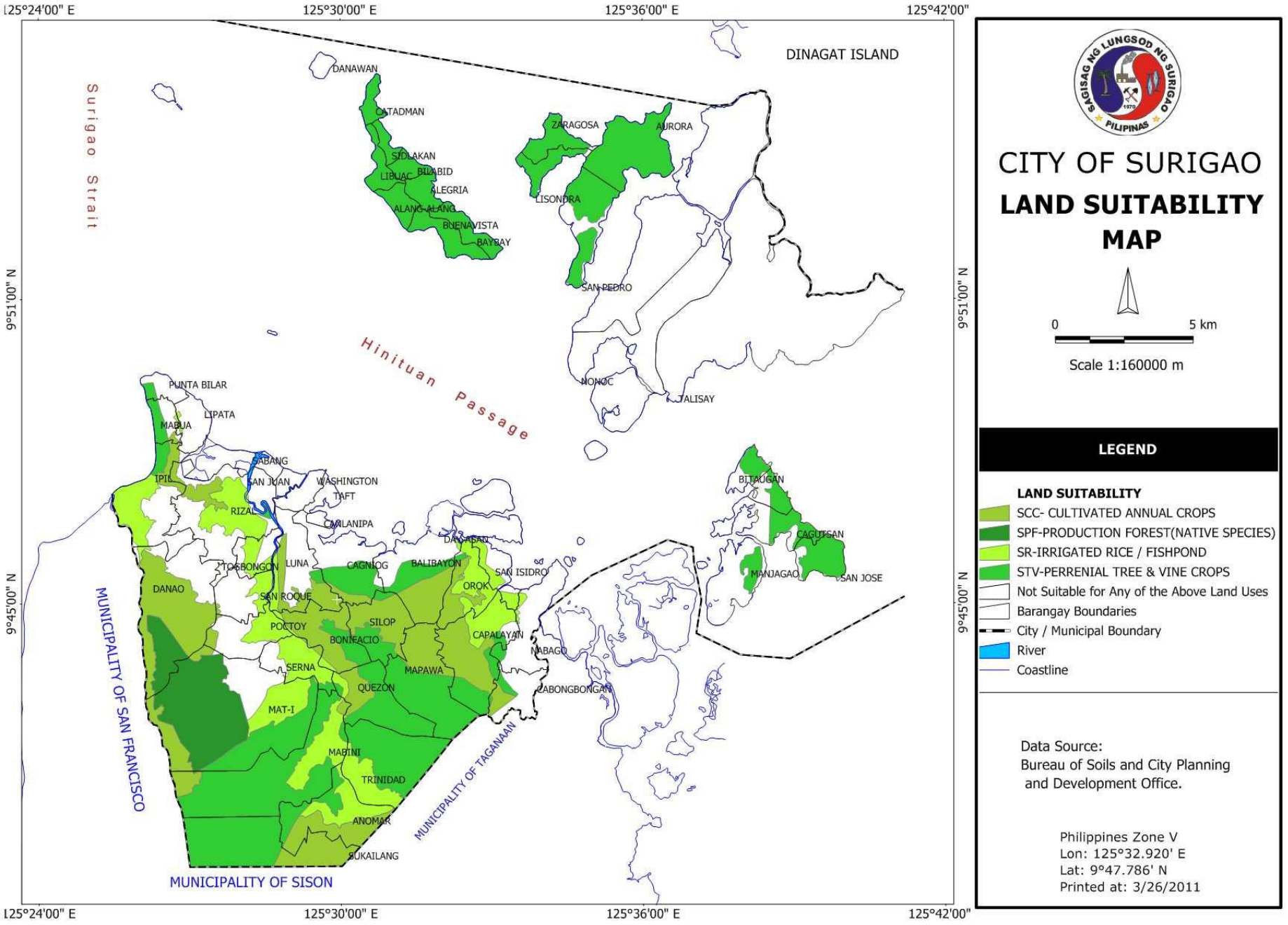
Scale 1:160000 m

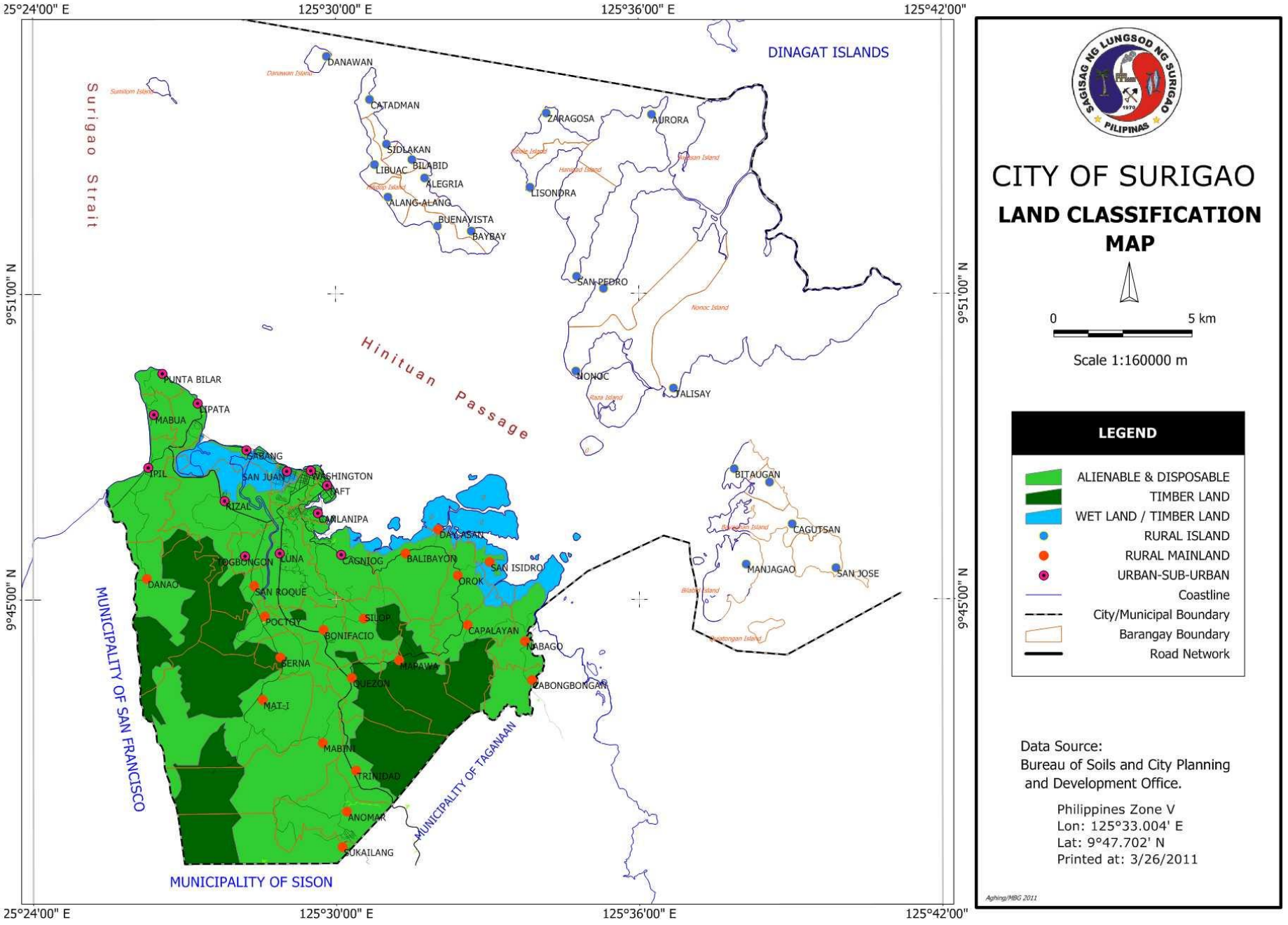
LEGEND

- CEMETERY
- River
- BARANGAY BOUNDARY

Data Source:
City Planning & Development Office

Philippines Zone V
Lon: 125°33.005' E
Lat: 9°47.892' N
Printed at: 2/20/2014


125°24'00" E
125°30'00" E
125°36'00" E
125°42'00"
9°51'00" N
9°45'00" N
DINAGAT ISLAND
Surigao Strait
Hinituan Passage
DANAWAN
CATADMAN
SIDLAKAN
LIBJAC
BILABID
ALEGRIA
ALANG-ALANG
BUENAVISTA
BAYBAY
ZARAGOSA
AURORA
LISONDRA
SAN PEDRO
NONOC
TALISAY
PUNTA BILAR
LIPATA
MABUA
CABANG
TIPIL
SAN JUAN
WASHINGTON
TAFT
RIZAL
CARLANIPA
DAGOHOY
TOGBONGON
LUNA
CAGNIOG
BALIBAYON
SAN ISIDRO
OROK
DANAO
SAN ROQUE
POCTOY
SILOP
BONIFACIO
CAPALAYAN
NABAGO
SERNA
MAPAWA
QUEZON
CABONGBONGAN
MAT-I
MABINI
TRINIDAD
ANOMAR
SUKAILANG
MUNICIPALITY OF SAN FRANCISCO
MUNICIPALITY OF TAGANAAN
MUNICIPALITY OF SISON
BITAUGAN
CAGUTSAN
MANJAGAO
SAN JOSE
SAGISAG NG LUNGSOD NG SURIGAO
1970
PILIPINAS
CITY OF SURIGAO
LAND SUITABILITY MAP
0
5 km
Scale 1:160000 m
LEGEND
LAND SUITABILITY
SCC- CULTIVATED ANNUAL CROPS
SPF-PRODUCTION FOREST(NATIVE SPECIES)
SR-IRRIGATED RICE / FISHPOND
STV-PERRENIAL TREE & VINE CROPS
Not Suitable for Any of the Above Land Uses
Barangay Boundaries
City / Municipal Boundary
River
Coastline
Data Source:
Bureau of Soils and City Planning and Development Office.
Philippines Zone V
Lon: 125°32.920' E
Lat: 9°47.786' N
Printed at: 3/26/2011



SAGISAG NG LUNGSOD NG SURIGAO
PILIPINAS

CITY OF SURIGAO

LAND CLASSIFICATION MAP

0 5 km

Scale 1:160000 m

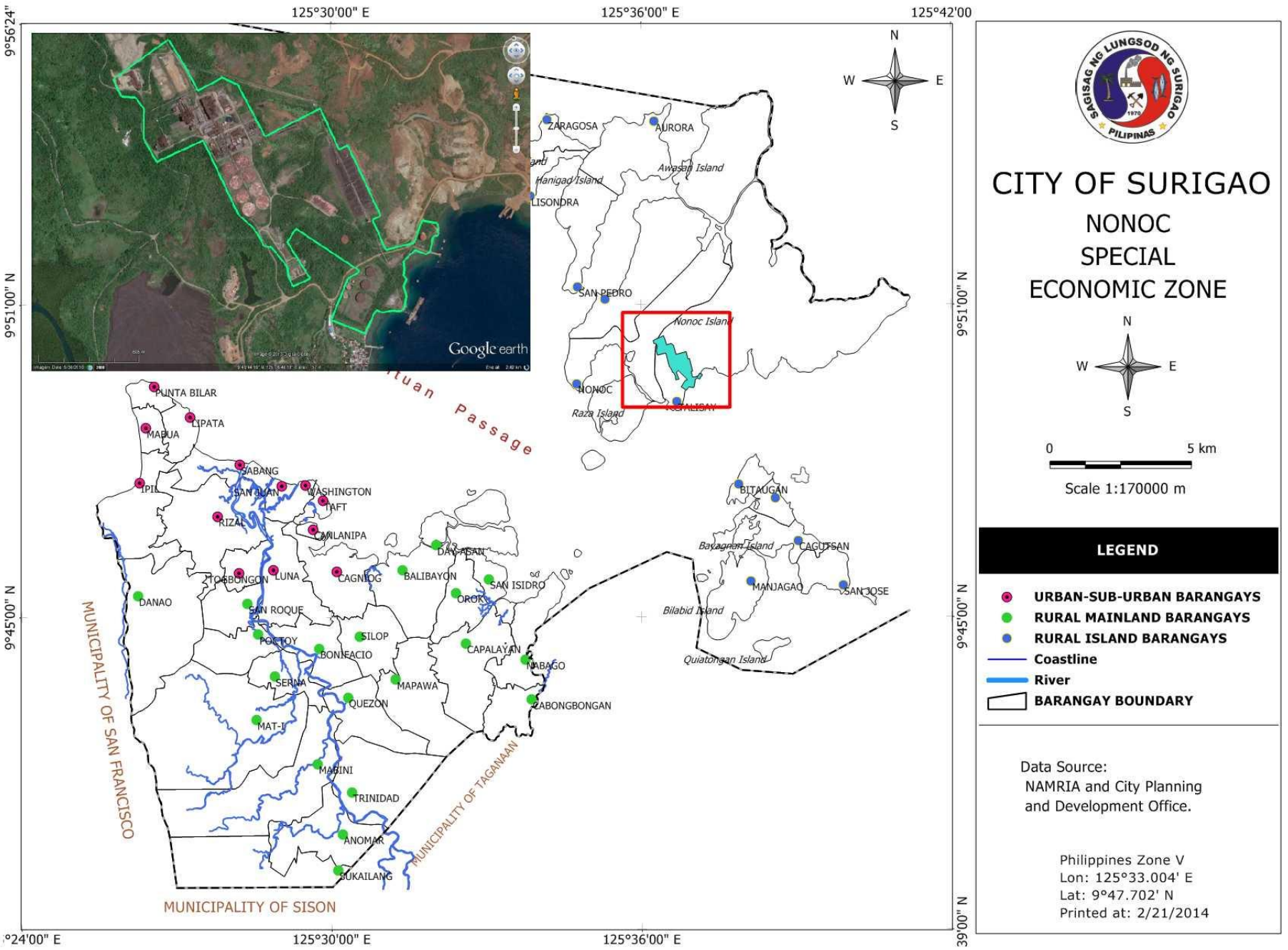
LEGEND

- ALIENABLE & DISPOSABLE
- TIMBER LAND
- WET LAND / TIMBER LAND
- RURAL ISLAND
- RURAL MAINLAND
- URBAN-SUB-URBAN
- Coastline
- City/Municipal Boundary
- Barangay Boundary
- Road Network

Data Source:
Bureau of Soils and City Planning and Development Office.

Philippines Zone V
Lon: 125°33.004' E
Lat: 9°47.702' N
Printed at: 3/26/2011

Aghing/MBG 2011



CITY OF SURIGAO

NONOC SPECIAL ECONOMIC ZONE

N
W E
S

0 5 km

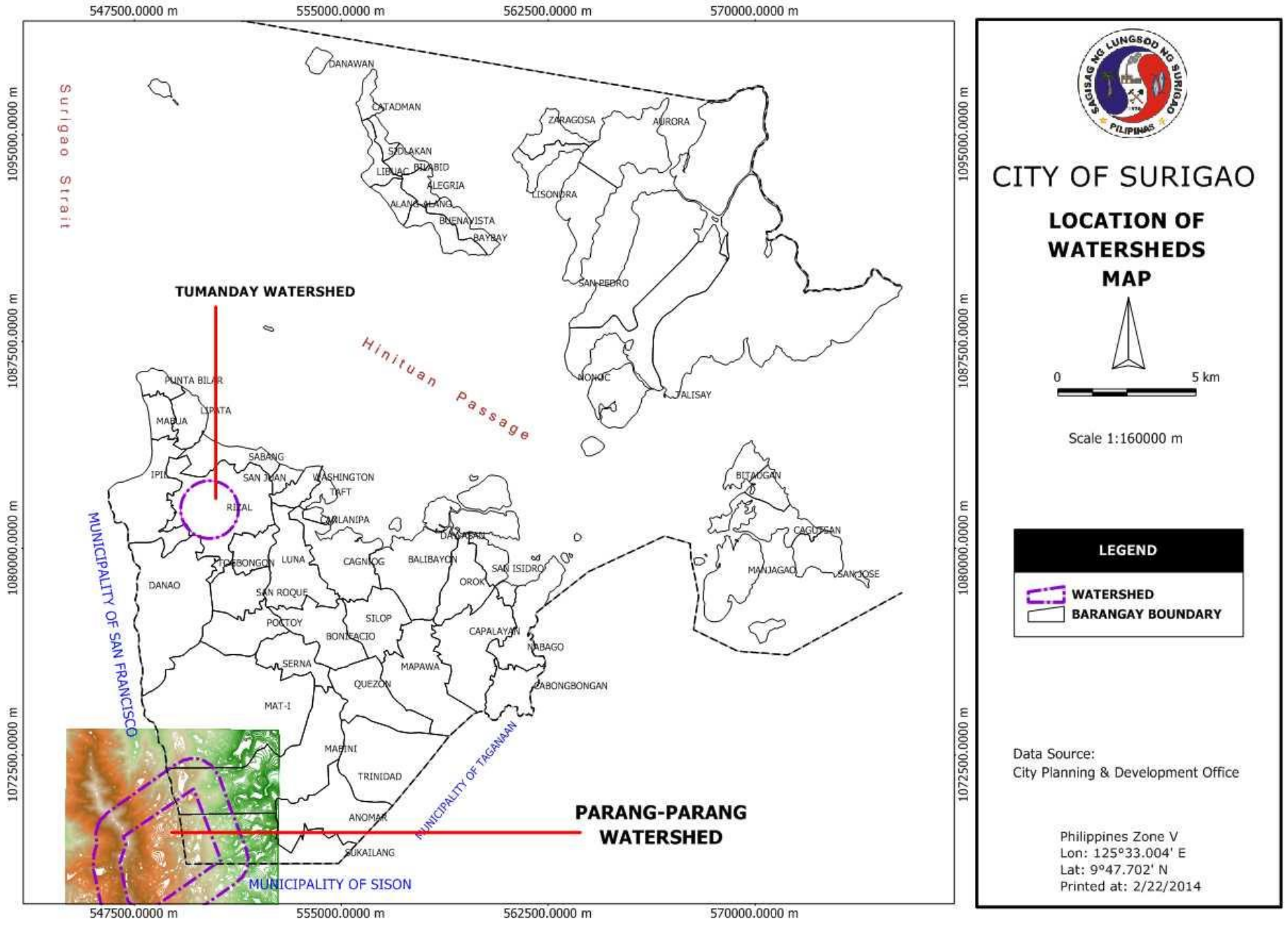
Scale 1:170000 m

LEGEND

- URBAN-SUB-URBAN BARANGAYS
- RURAL MAINLAND BARANGAYS
- RURAL ISLAND BARANGAYS
- Coastline
- River
- BARANGAY BOUNDARY

Data Source:
NAMRIA and City Planning and Development Office.

Philippines Zone V
Lon: 125°33.004' E
Lat: 9°47.702' N
Printed at: 2/21/2014



SAGISAG NG LUNGSOD NG SURIGAO PILIPINAS

CITY OF SURIGAO

LOCATION OF WATERSHEDS MAP

0 5 km

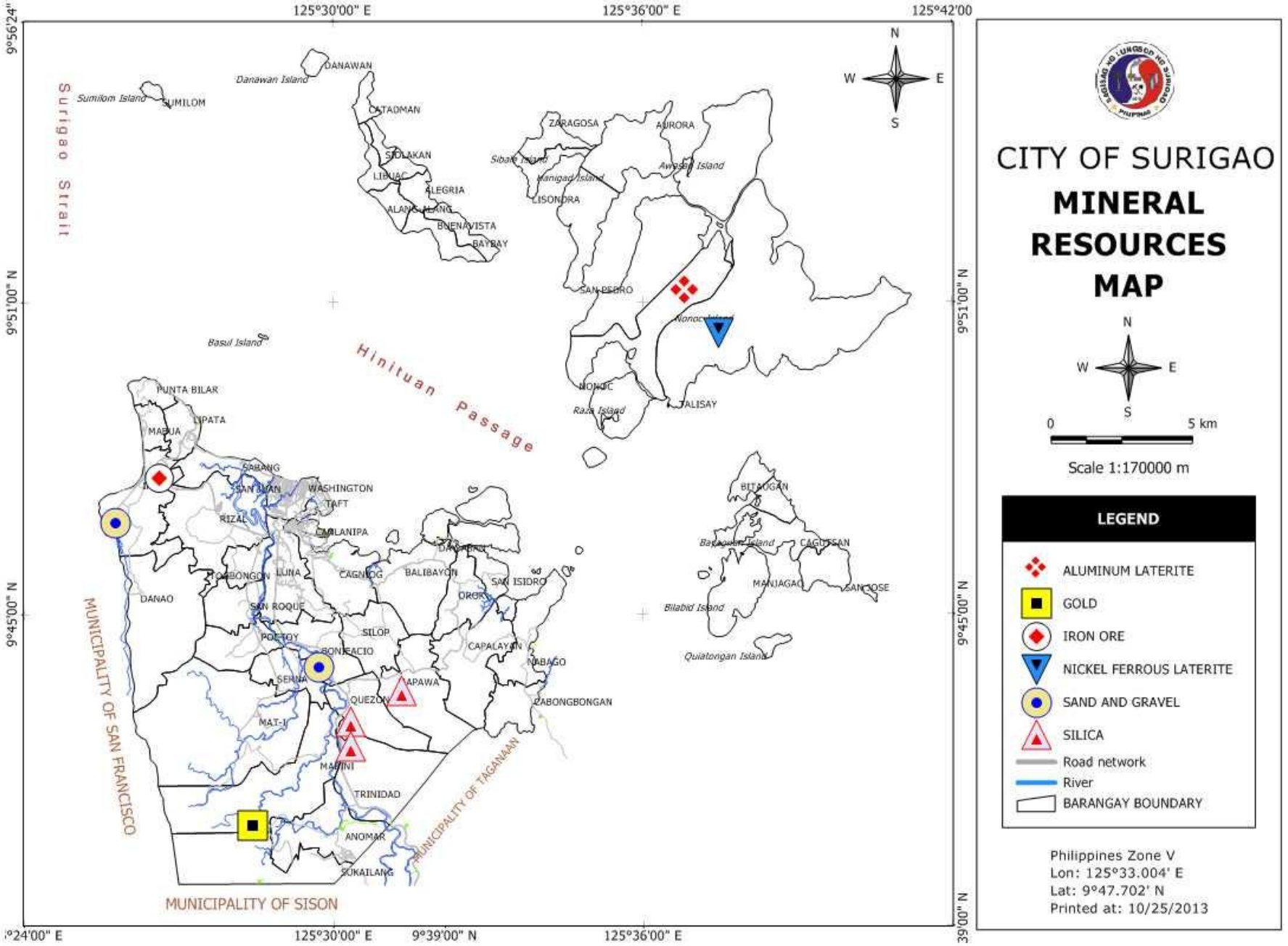
Scale 1:160000 m

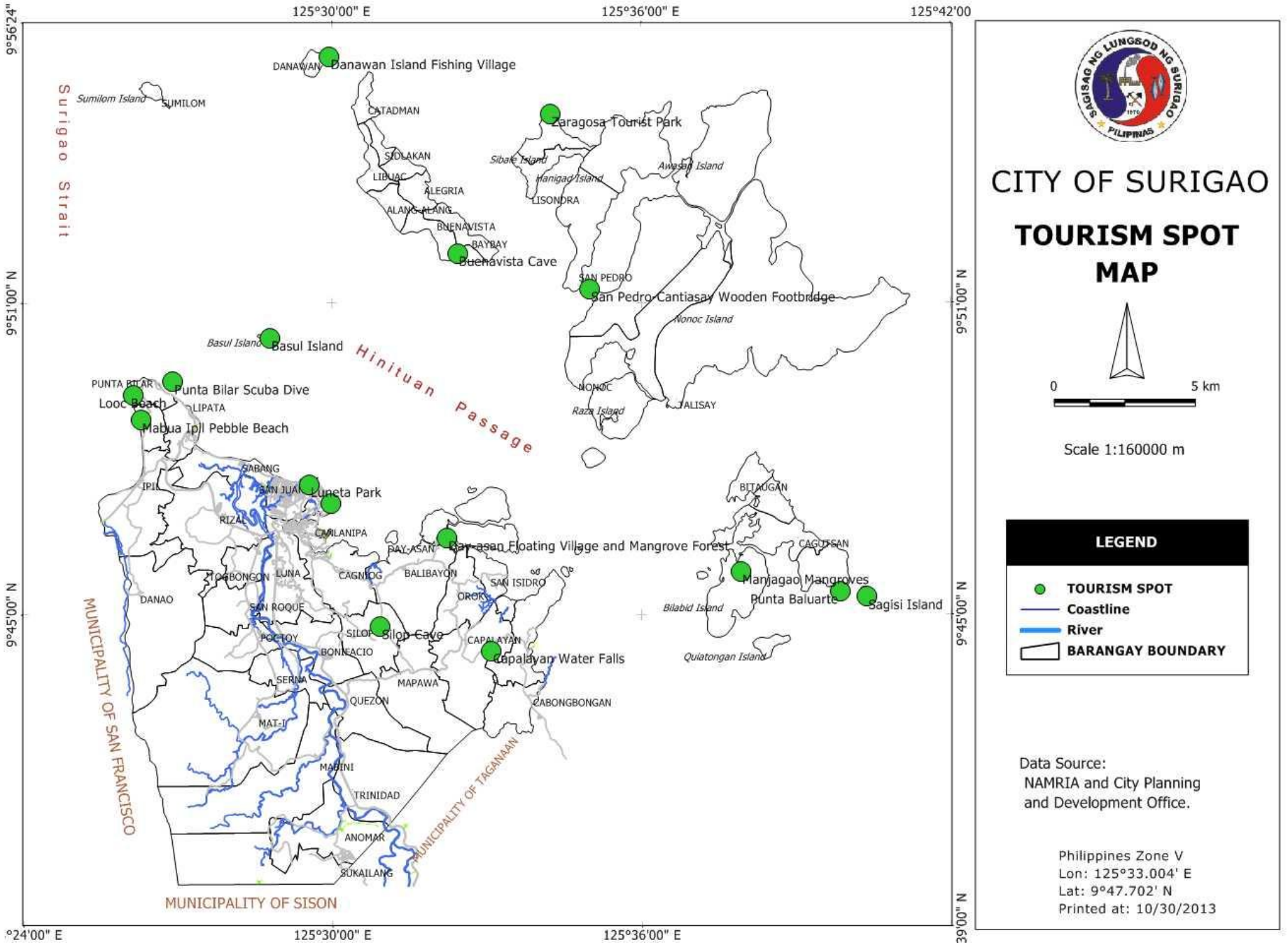
LEGEND

- WATERSHED
- BARANGAY BOUNDARY

Data Source:
City Planning & Development Office

Philippines Zone V
Lon: 125°33.004' E
Lat: 9°47.702' N
Printed at: 2/22/2014


125°30'00" E
125°36'00" E
125°42'00
9°56'24"
9°51'00" N
9°45'00" N
9°39'00" N
125°24'00" E
N
W
E
S
Surigao Strait
Hinituan Passage
Sumilom Island
SUMILOM
Danawan Island
DANAWAN
CATADMAN
SOLAKAN
LIBUAC
ALEGRIA
ALANG-ALANG
BUENAVISTA
BAYBAY
ZARAGOSA
AURORA
Sibale Island
Awasian Island
Manigad Island
LISONDRA
SAN PEDRO
Nonoc Island
NONOC
TALISAY
Raza Island
Basul Island
PUNTA BILAR
LIPATA
MABUA
SABANG
SAN JUAN
WASHINGTON
TAFT
RIZAL
CAMILANIPA
DAPA-DAPA
LUNA
CAGNIPA
BALIBAYON
SAN ISIDRO
ORO
DANAO
SAN ROQUE
POBLACION
SILOP
BONIFACIO
CAPALAYAN
NABAGO
SERNA
APAWA
QUEZON
CABONGBONGAN
MAT-I
MAGINI
TRINIDAD
ANOMAR
SUKAILANG
MUNICIPALITY OF SAN FRANCISCO
MUNICIPALITY OF TAGANAAN
MUNICIPALITY OF SISON
BITAUGAN
Bacuag Island
CAGUTSAN
MANJAGAO
SAN JOSE
Bilabid Island
Quiatongan Island
CITY OF SURIGAO
MINERAL RESOURCES MAP
0
5 km
Scale 1:170000 m
LEGEND
ALUMINUM LATERITE
GOLD
IRON ORE
NICKEL FERROUS LATERITE
SAND AND GRAVEL
SILICA
Road network
River
BARANGAY BOUNDARY
Philippines Zone V
Lon: 125°33.004' E
Lat: 9°47.702' N
Printed at: 10/25/2013



CITY OF SURIGAO

TOURISM SPOT MAP

0 5 km

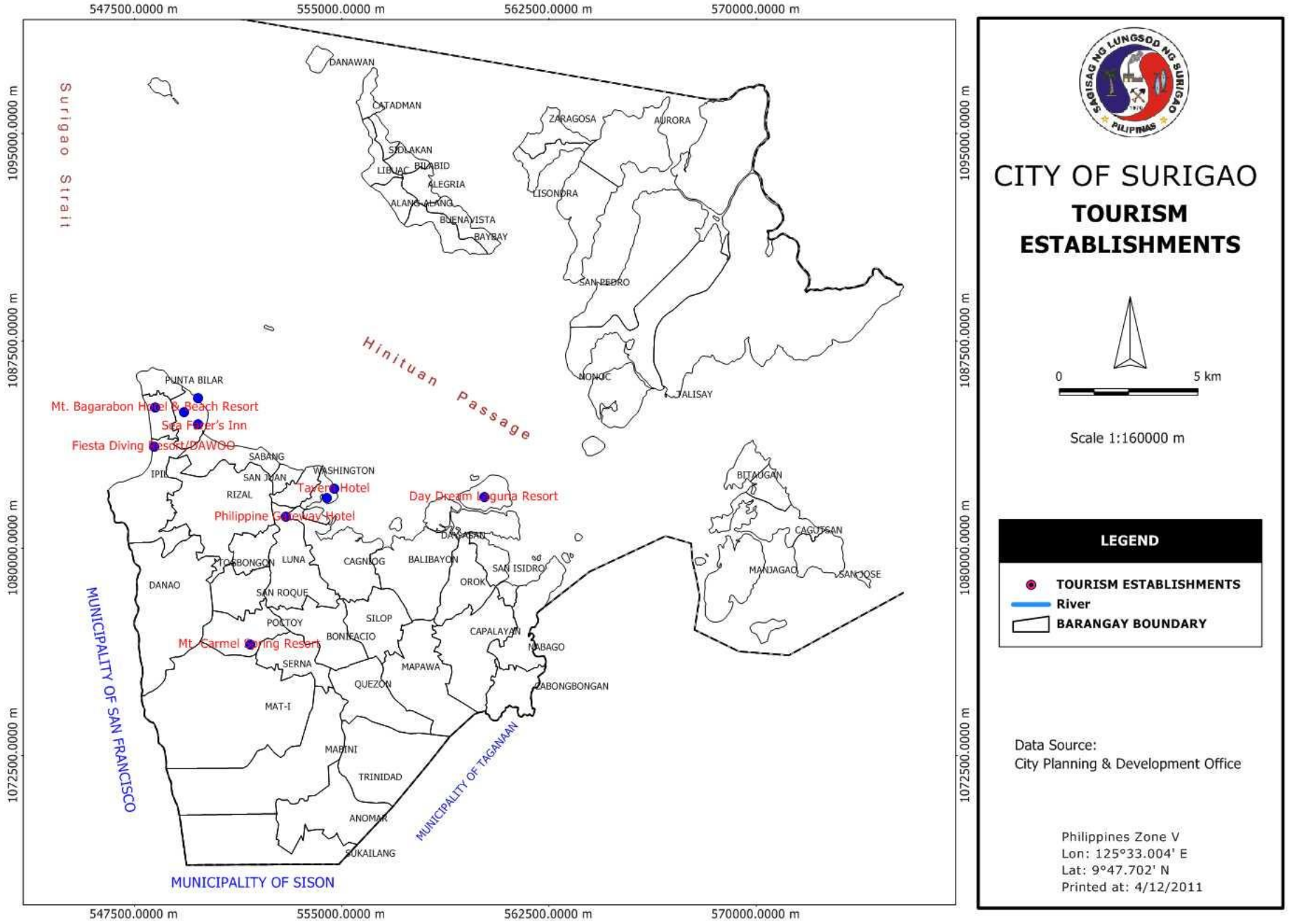
Scale 1:160000 m

LEGEND

- TOURISM SPOT
- Coastline
- River
- BARANGAY BOUNDARY

Data Source:
NAMRIA and City Planning and Development Office.

Philippines Zone V
Lon: 125°33.004' E
Lat: 9°47.702' N
Printed at: 10/30/2013



CITY OF SURIGAO

TOURISM ESTABLISHMENTS

0 5 km

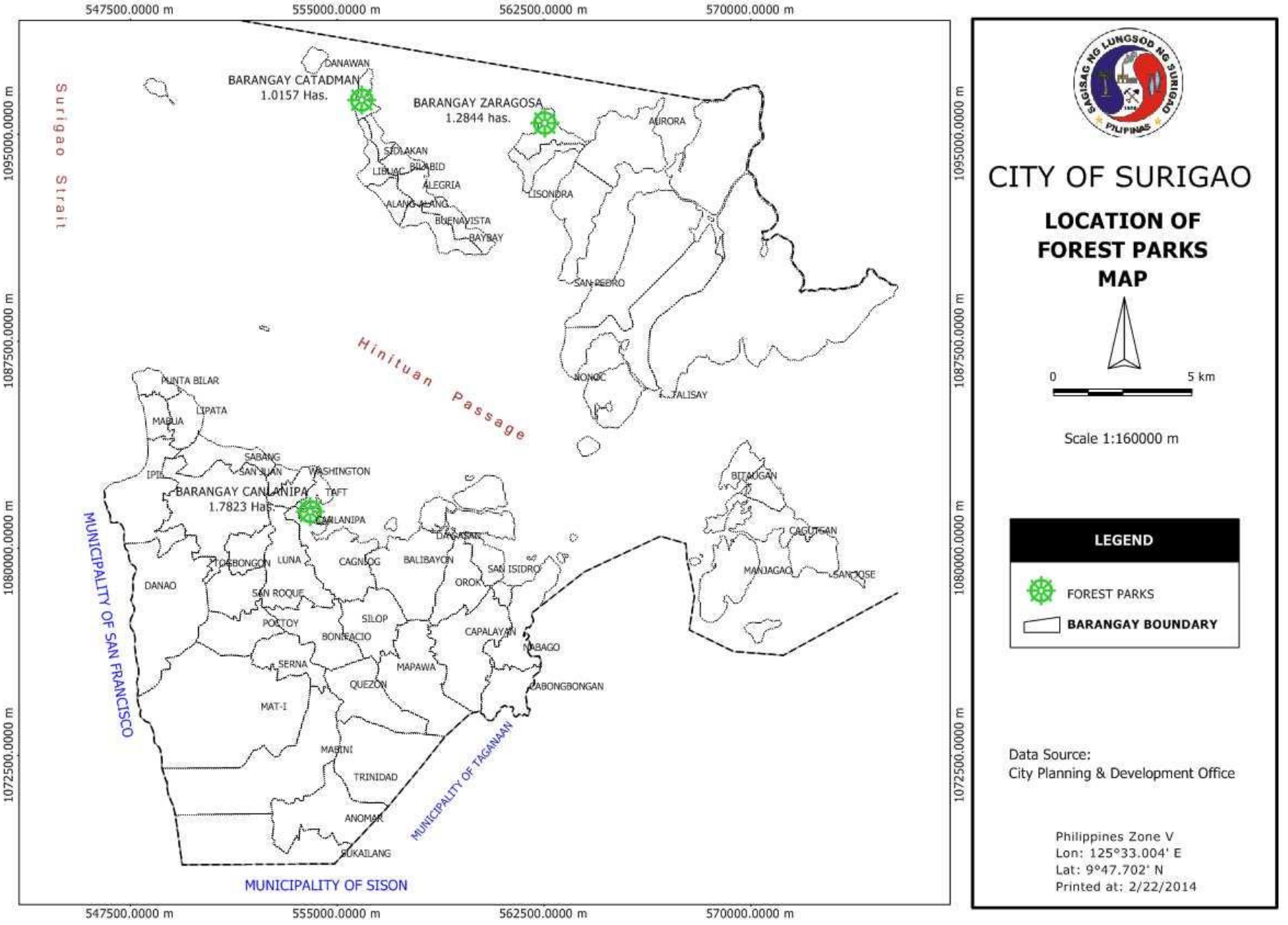
Scale 1:160000 m

LEGEND

- TOURISM ESTABLISHMENTS
- River
- BARANGAY BOUNDARY

Data Source:
City Planning & Development Office

Philippines Zone V
Lon: 125°33.004' E
Lat: 9°47.702' N
Printed at: 4/12/2011



SAGISAG NG LUNGSOD NG SURIGAO
PILIPINAS

CITY OF SURIGAO

LOCATION OF FOREST PARKS MAP

0 5 km

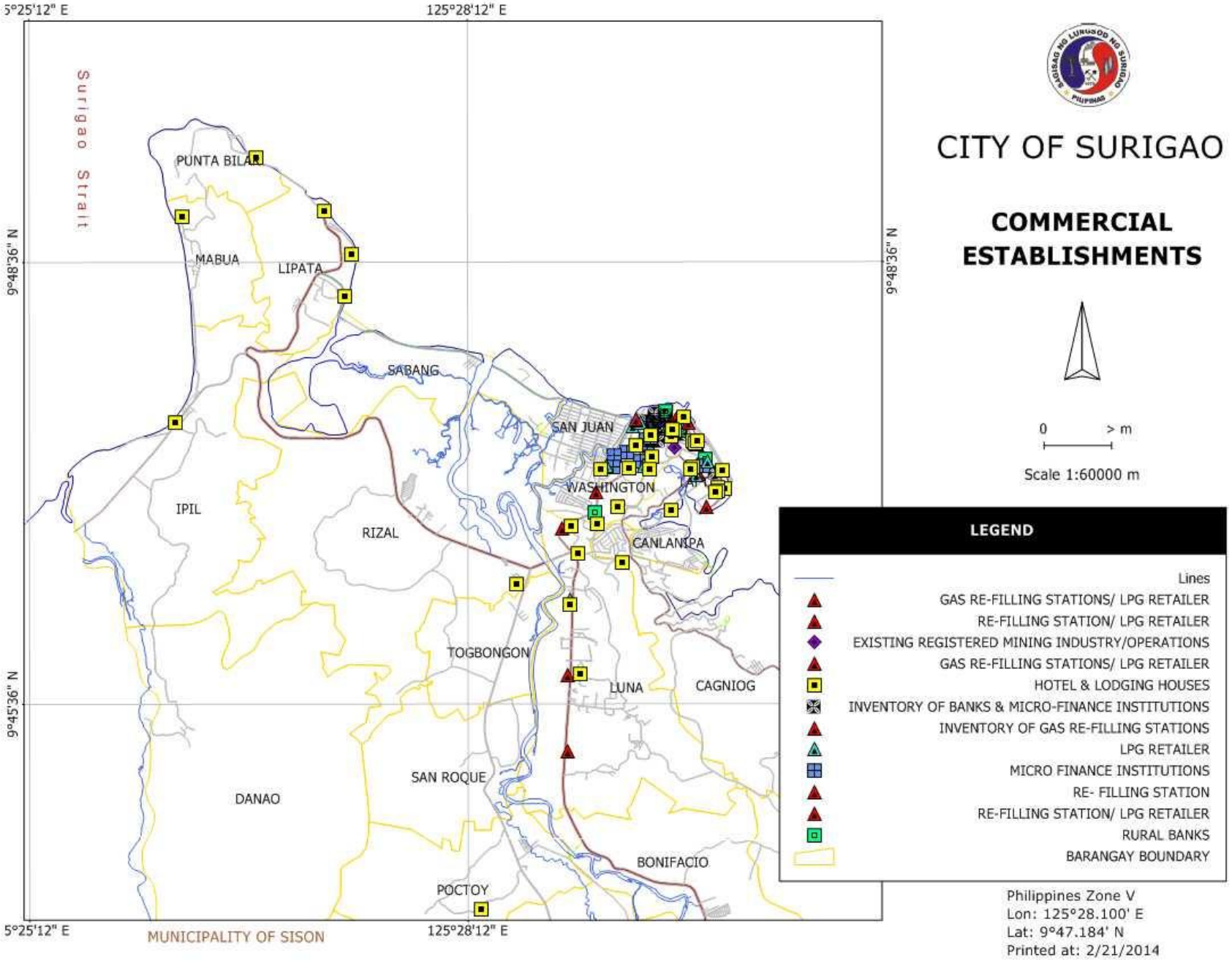
Scale 1:160000 m

LEGEND

- FOREST PARKS
- BARANGAY BOUNDARY

Data Source:
City Planning & Development Office

Philippines Zone V
Lon: 125°33.004' E
Lat: 9°47.702' N
Printed at: 2/22/2014



CITY OF SURIGAO

COMMERCIAL ESTABLISHMENTS

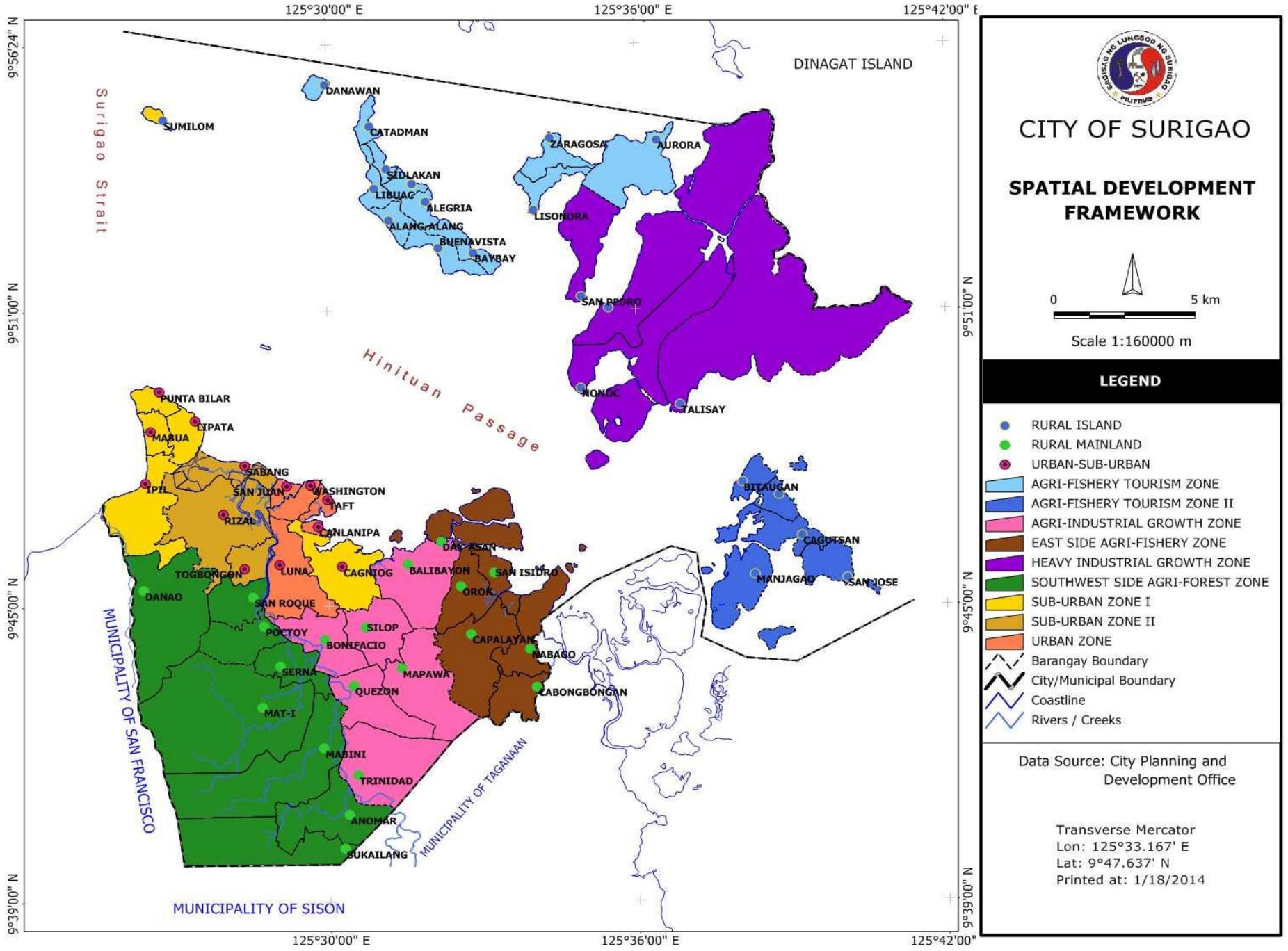
0 > m

Scale 1:60000 m

LEGEND

- Lines
- GAS RE-FILLING STATIONS/ LPG RETAILER
- RE-FILLING STATION/ LPG RETAILER
- EXISTING REGISTERED MINING INDUSTRY/OPERATIONS
- GAS RE-FILLING STATIONS/ LPG RETAILER
- HOTEL & LODGING HOUSES
- INVENTORY OF BANKS & MICRO-FINANCE INSTITUTIONS
- INVENTORY OF GAS RE-FILLING STATIONS
- LPG RETAILER
- MICRO FINANCE INSTITUTIONS
- RE- FILLING STATION
- RE-FILLING STATION/ LPG RETAILER
- RURAL BANKS
- BARANGAY BOUNDARY

Philippines Zone V
Lon: 125°28.100' E
Lat: 9°47.184' N
Printed at: 2/21/2014



CITY OF SURIGAO

SPATIAL DEVELOPMENT FRAMEWORK

0 5 km

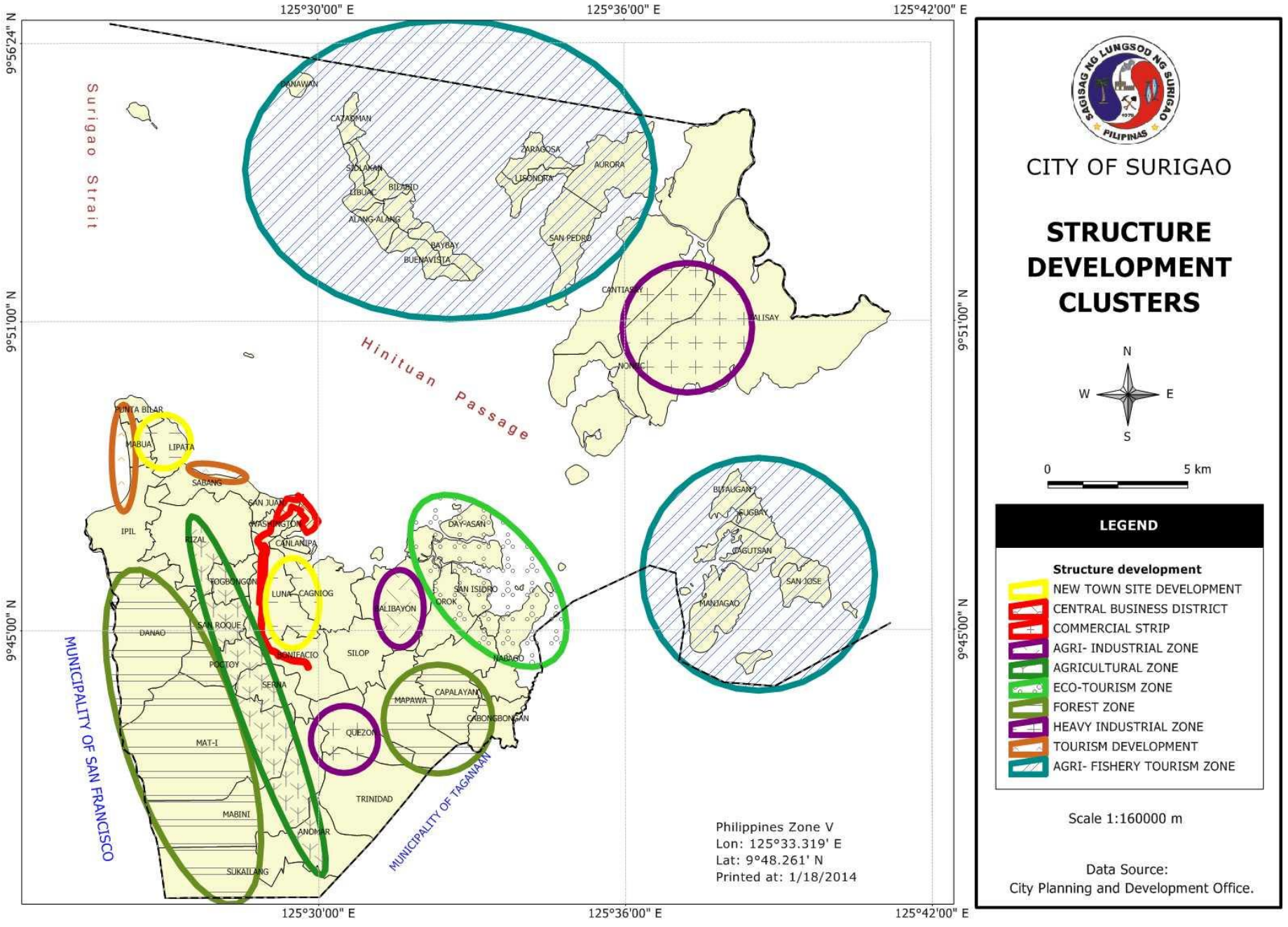
Scale 1:160000 m

LEGEND

- RURAL ISLAND
- RURAL MAINLAND
- URBAN-SUB-URBAN
- AGRI-FISHERY TOURISM ZONE
- AGRI-FISHERY TOURISM ZONE II
- AGRI-INDUSTRIAL GROWTH ZONE
- EAST SIDE AGRI-FISHERY ZONE
- HEAVY INDUSTRIAL GROWTH ZONE
- SOUTHWEST SIDE AGRI-FOREST ZONE
- SUB-URBAN ZONE I
- SUB-URBAN ZONE II
- URBAN ZONE
- Barangay Boundary
- City/Municipal Boundary
- Coastline
- Rivers / Creeks

Data Source: City Planning and Development Office

Transverse Mercator
Lon: 125°33.167' E
Lat: 9°47.637' N
Printed at: 1/18/2014



CITY OF SURIGAO

STRUCTURE DEVELOPMENT CLUSTERS

N
W E
S

0 5 km

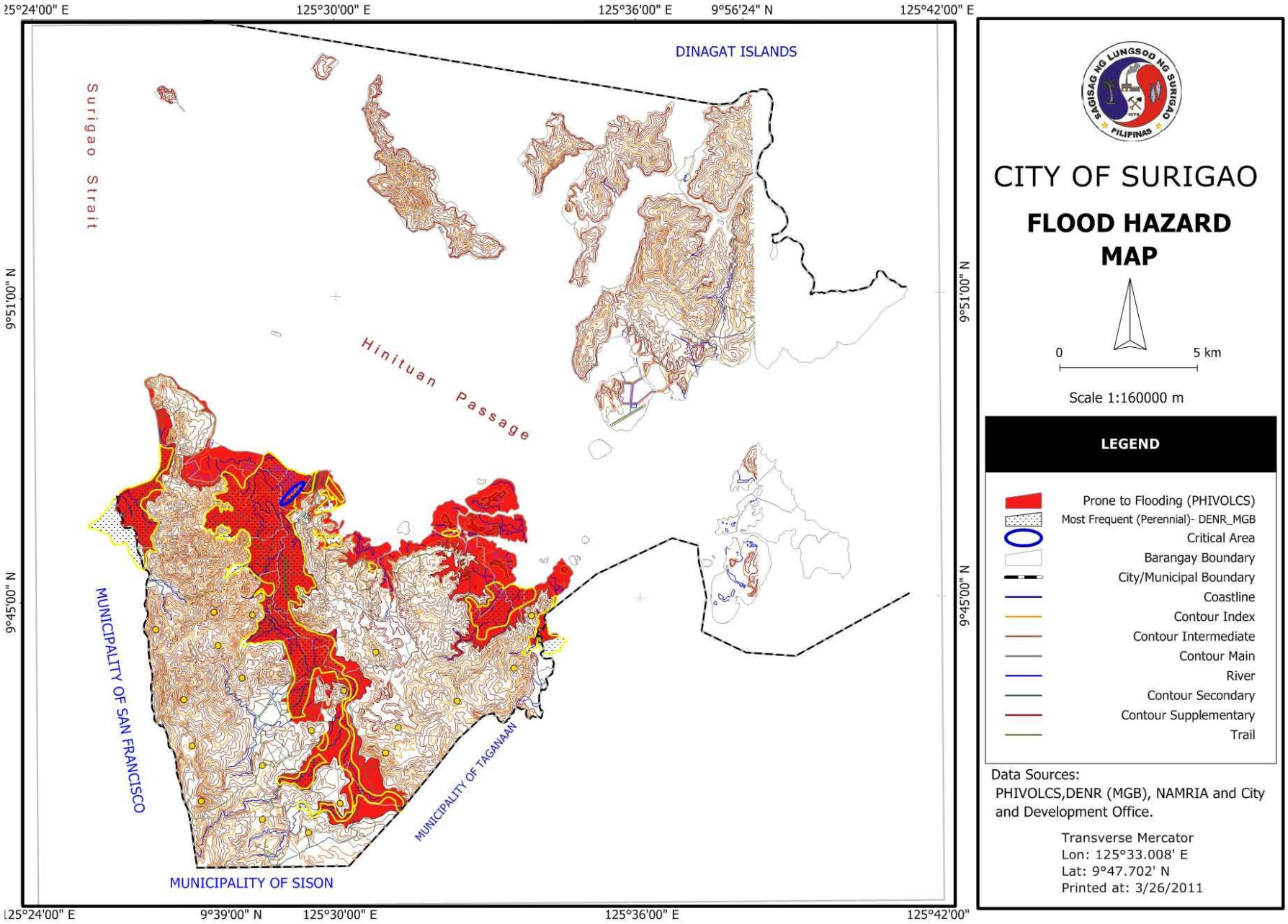
LEGEND

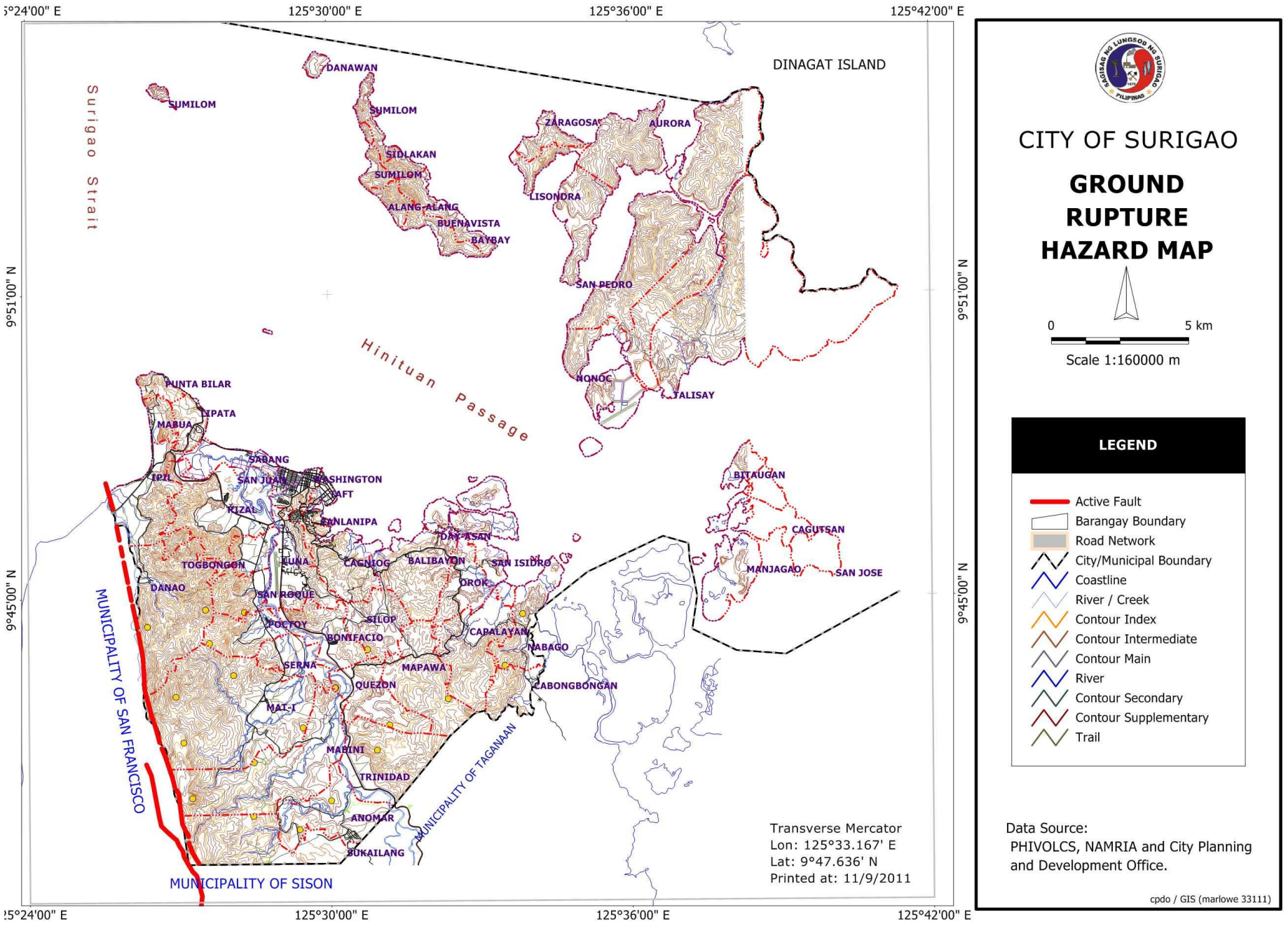
Structure development

- NEW TOWN SITE DEVELOPMENT
- CENTRAL BUSINESS DISTRICT
- COMMERCIAL STRIP
- AGRI- INDUSTRIAL ZONE
- AGRICULTURAL ZONE
- ECO-TOURISM ZONE
- FOREST ZONE
- HEAVY INDUSTRIAL ZONE
- TOURISM DEVELOPMENT
- AGRI- FISHERY TOURISM ZONE

Scale 1:160000 m

Data Source:
City Planning and Development Office.


125°24'00" E
125°30'00" E
125°36'00" E
9°56'24" N
125°42'00" E
DINAGAT ISLANDS
Surigao Strait
Hinituan Passage
9°51'00" N
9°45'00" N
MUNICIPALITY OF SAN FRANCISCO
MUNICIPALITY OF TAGANAAN
MUNICIPALITY OF SISON
9°39'00" N
CITY OF SURIGAO
FLOOD HAZARD MAP
0
5 km
Scale 1:160000 m
LEGEND
Prone to Flooding (PHIVOLCS)
Most Frequent (Perennial)- DENR_MGB
Critical Area
Barangay Boundary
City/Municipal Boundary
Coastline
Contour Index
Contour Intermediate
Contour Main
River
Contour Secondary
Contour Supplementary
Trail
Data Sources:
PHIVOLCS,DENR (MGB), NAMRIA and City and Development Office.
Transverse Mercator
Lon: 125°33.008' E
Lat: 9°47.702' N
Printed at: 3/26/2011



CITY OF SURIGAO

GROUND RUPTURE HAZARD MAP

0 5 km

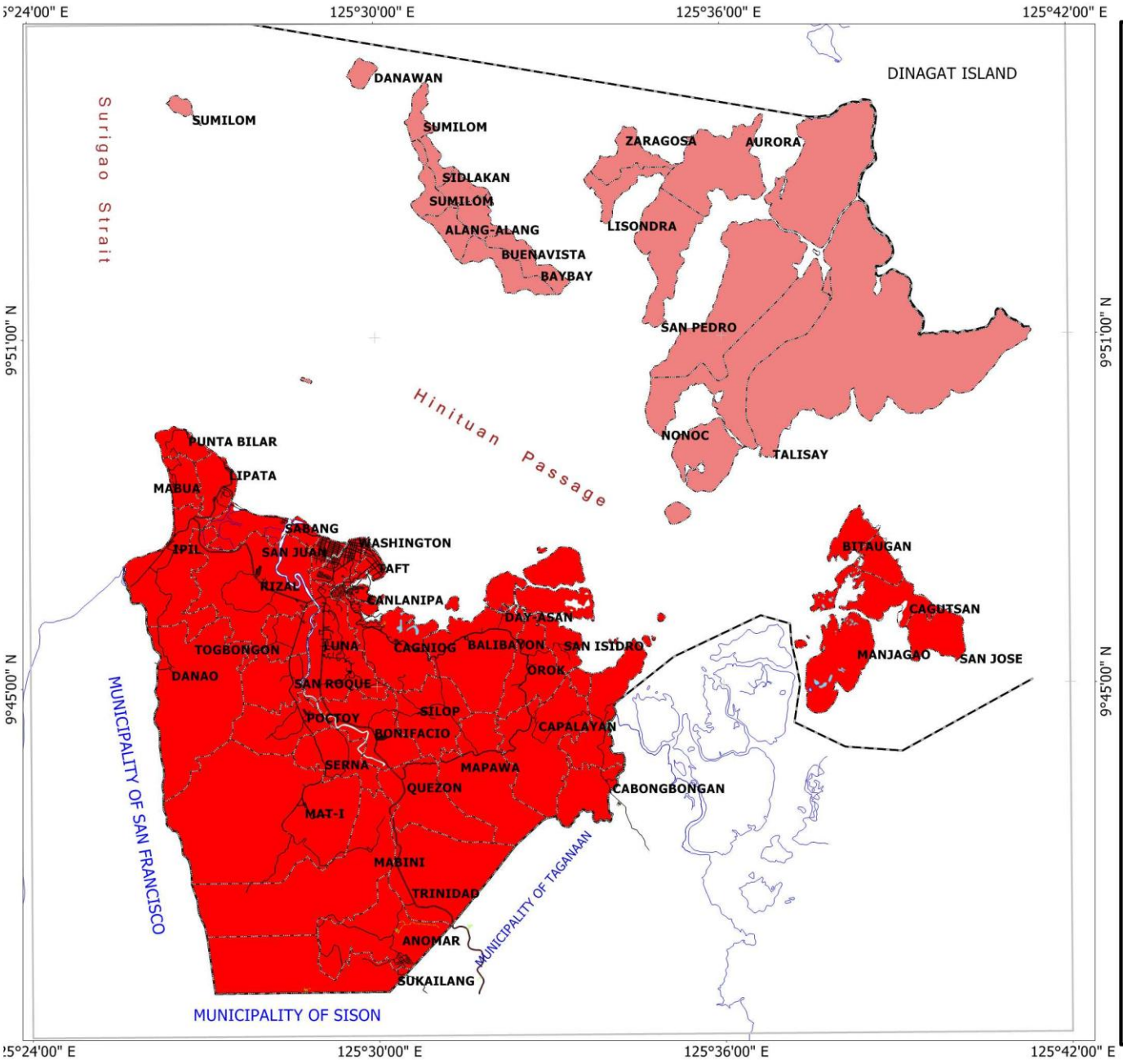
Scale 1:160000 m

LEGEND

- Active Fault
- Barangay Boundary
- Road Network
- City/Municipal Boundary
- Coastline
- River / Creek
- Contour Index
- Contour Intermediate
- Contour Main
- River
- Contour Secondary
- Contour Supplementary
- Trail

Data Source:
PHIVOLCS, NAMRIA and City Planning and Development Office.

cpdo / GIS (marlowe 33111)



CITY OF SURIGAO

GROUND-SHAKING HAZARD MAP

0 5 km

Scale 1:160000 m

LEGEND

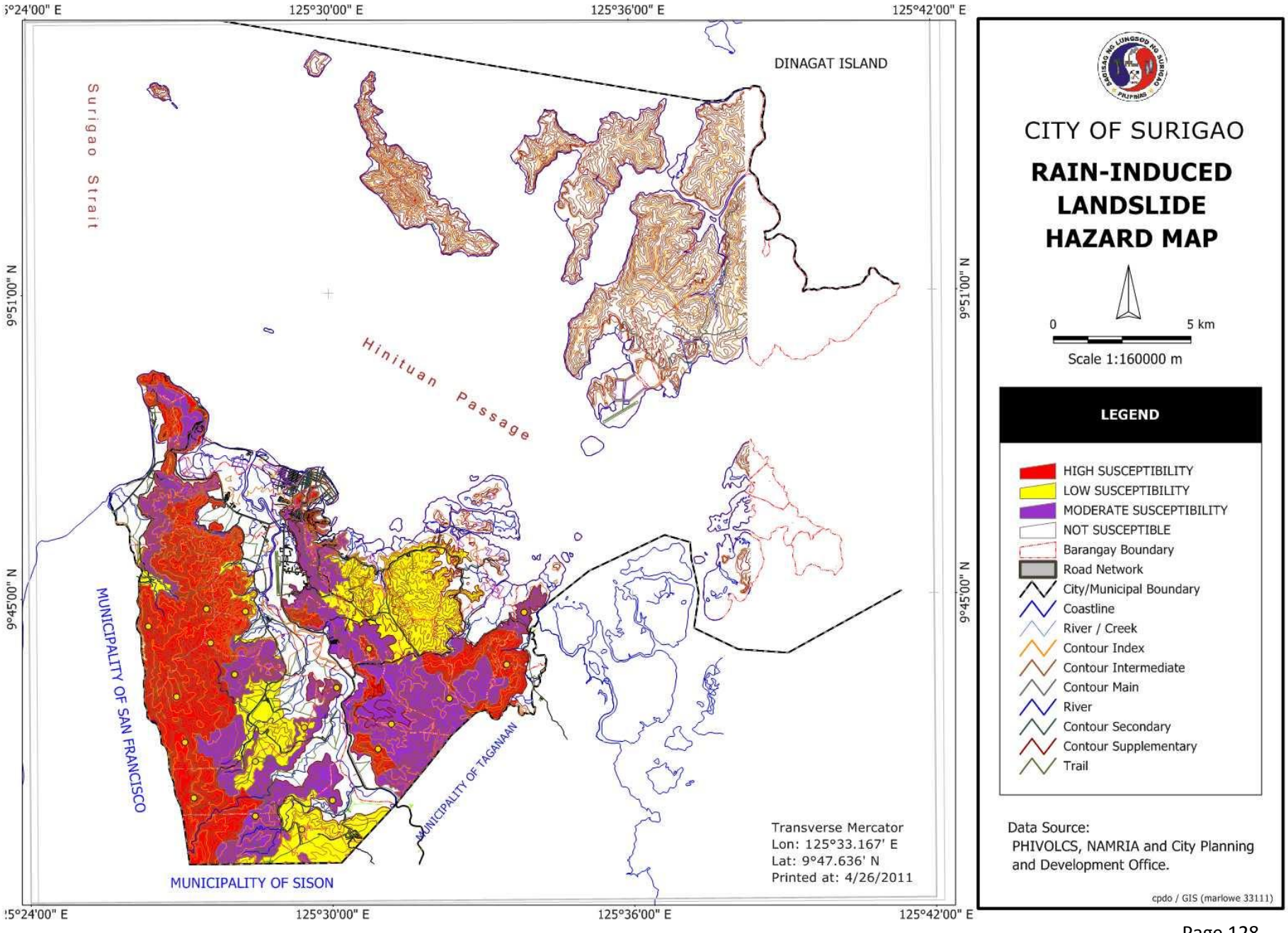
- PEIS INTENSITY VII & ABOVE
- PEIS INTENSITY VII
- Barangay Boundary
- Road Network
- City/Municipal Boundary

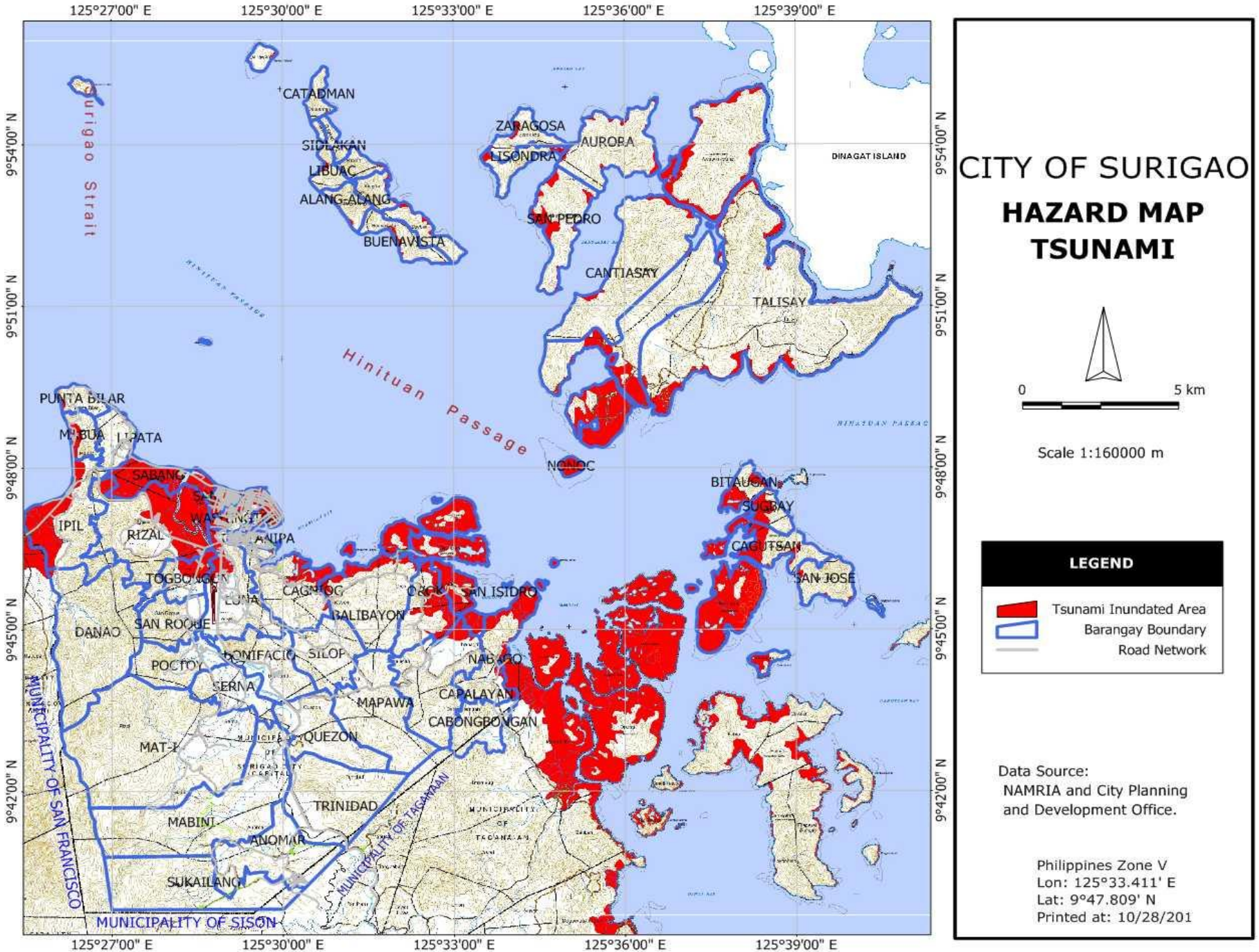
PEIS - PHIVOLCS Earthquake Intensity Scale

Data Source:
PHIVOLCS, NAMRIA and City Planning and Development Office.

Transverse Mercator
Lon: 125°33.167' E
Lat: 9°47.636' N
Printed at: 11/9/2011

cpdo / GIS (marlowe 33111)


125°24'00" E
125°30'00" E
125°36'00" E
125°42'00" E
9°51'00" N
9°45'00" N
DINAGAT ISLAND
Surigao Strait
Hinituan Passage
MUNICIPALITY OF SAN FRANCISCO
MUNICIPALITY OF TAGANAAN
MUNICIPALITY OF SISON
Transverse Mercator
Lon: 125°33.167' E
Lat: 9°47.636' N
Printed at: 4/26/2011
CITY OF SURIGAO
RAIN-INDUCED LANDSLIDE HAZARD MAP
0
5 km
Scale 1:160000 m
LEGEND
HIGH SUSCEPTIBILITY
LOW SUSCEPTIBILITY
MODERATE SUSCEPTIBILITY
NOT SUSCEPTIBLE
Barangay Boundary
Road Network
City/Municipal Boundary
Coastline
River / Creek
Contour Index
Contour Intermediate
Contour Main
River
Contour Secondary
Contour Supplementary
Trail
Data Source:
PHIVOLCS, NAMRIA and City Planning and Development Office.
cpdo / GIS (marlowe 33111)



CITY OF SURIGAO

HAZARD MAP
TSUNAMI

0 5 km

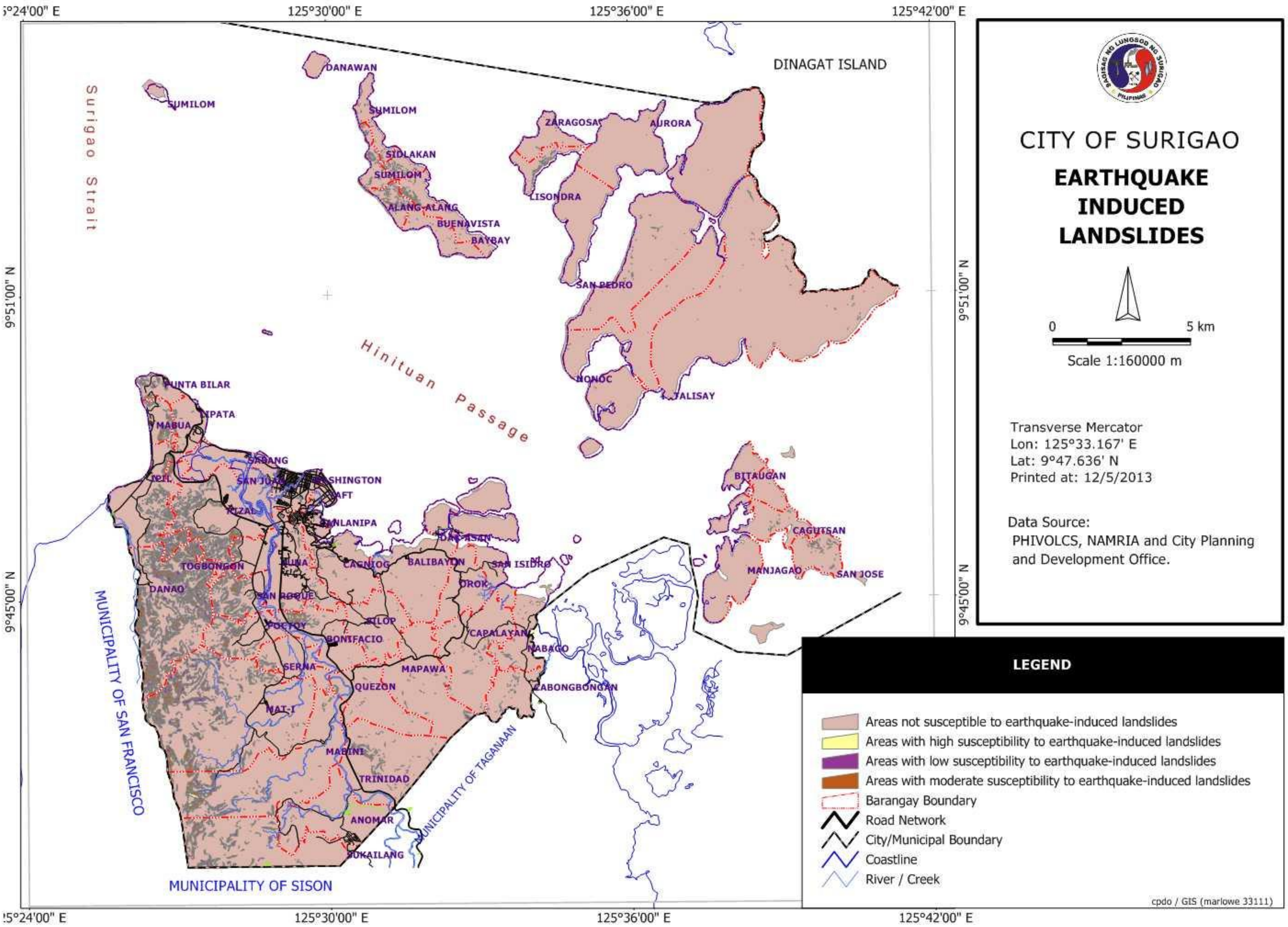
Scale 1:160000 m

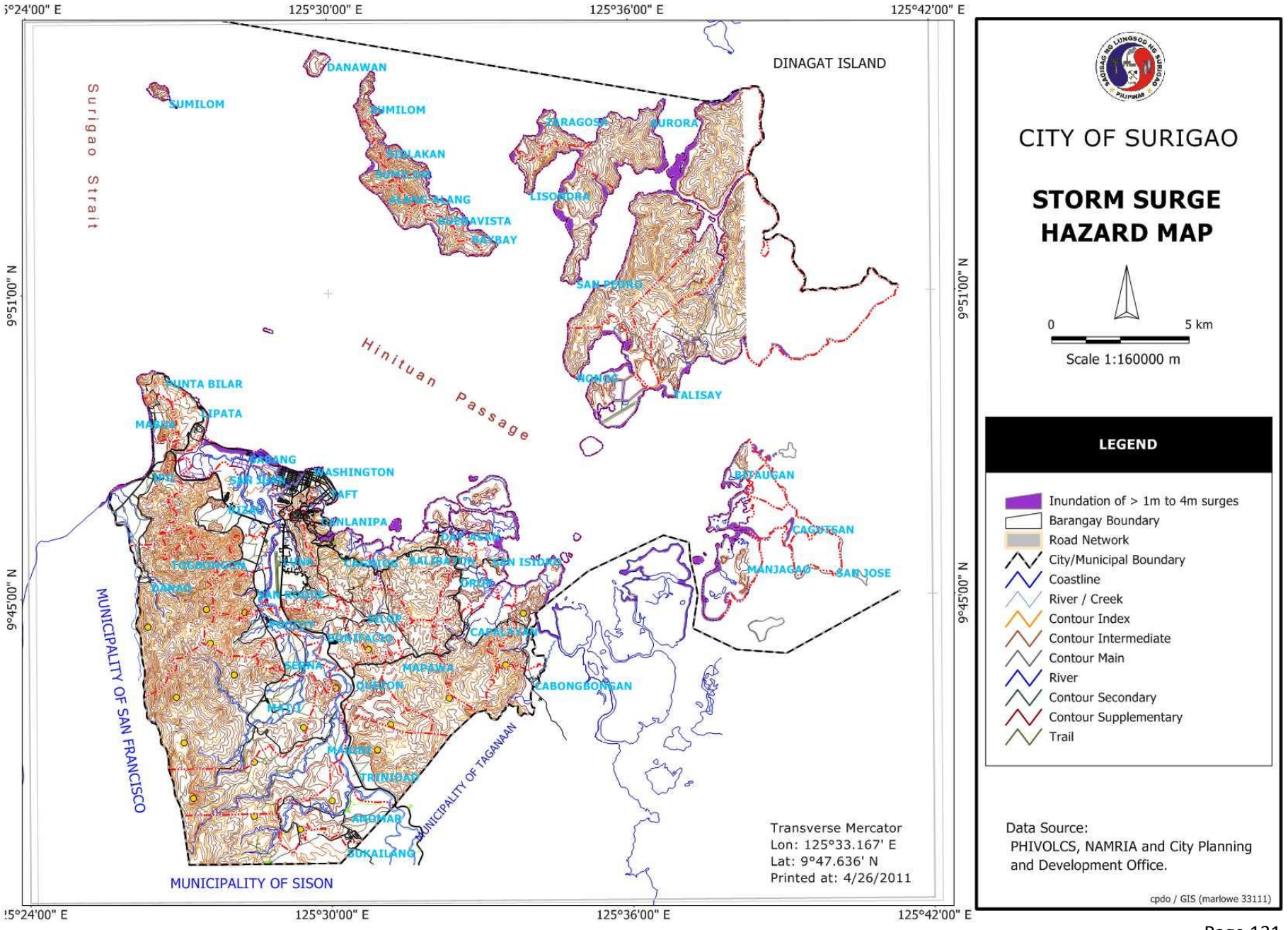
LEGEND

- Tsunami Inundated Area
- Barangay Boundary
- Road Network

Data Source:
NAMRIA and City Planning and Development Office.

Philippines Zone V
Lon: 125°33.411' E
Lat: 9°47.809' N
Printed at: 10/28/201


CITY OF SURIGAO
EARTHQUAKE INDUCED LANDSLIDES
0
5 km
Scale 1:160000 m
Transverse Mercator
Lon: 125°33.167' E
Lat: 9°47.636' N
Printed at: 12/5/2013
Data Source:
PHIVOLCS, NAMRIA and City Planning and Development Office.
LEGEND
Areas not susceptible to earthquake-induced landslides
Areas with high susceptibility to earthquake-induced landslides
Areas with low susceptibility to earthquake-induced landslides
Areas with moderate susceptibility to earthquake-induced landslides
Barangay Boundary
Road Network
City/Municipal Boundary
Coastline
River / Creek
cpdo / GIS (marlowe 33111)
125°30'00" E
125°36'00" E
125°42'00" E
9°51'00" N
9°45'00" N
DINAGAT ISLAND
Surigao Strait
Hinituan Passage
MUNICIPALITY OF SAN FRANCISCO
MUNICIPALITY OF SISON
MUNICIPALITY OF TAGANAAN
DANAWAN
SUMILOM
SIDLAKAN
ALANG-ALANG
BUENAVISTA
BAYBAY
ZARAGOSA
AURORA
LISONDRA
SAN PEDRO
NONOC
TALISAY
BITAUGAN
CAGUTSAN
MANJAGAO
SAN JOSE
PUNTA BILAR
MABUA
TOGBONGON
DANAO
SAN ROQUE
BONIFACIO
BALIBAYON
SAN ISIDRO
CAPALAYAN
MAPAWA
QUEZON
SERNA
MAT-I
MABINI
TRINIDAD
ANOMAR
LUKAILANG
CABONGBONGAN



CITY OF SURIGAO

STORM SURGE HAZARD MAP

0 5 km

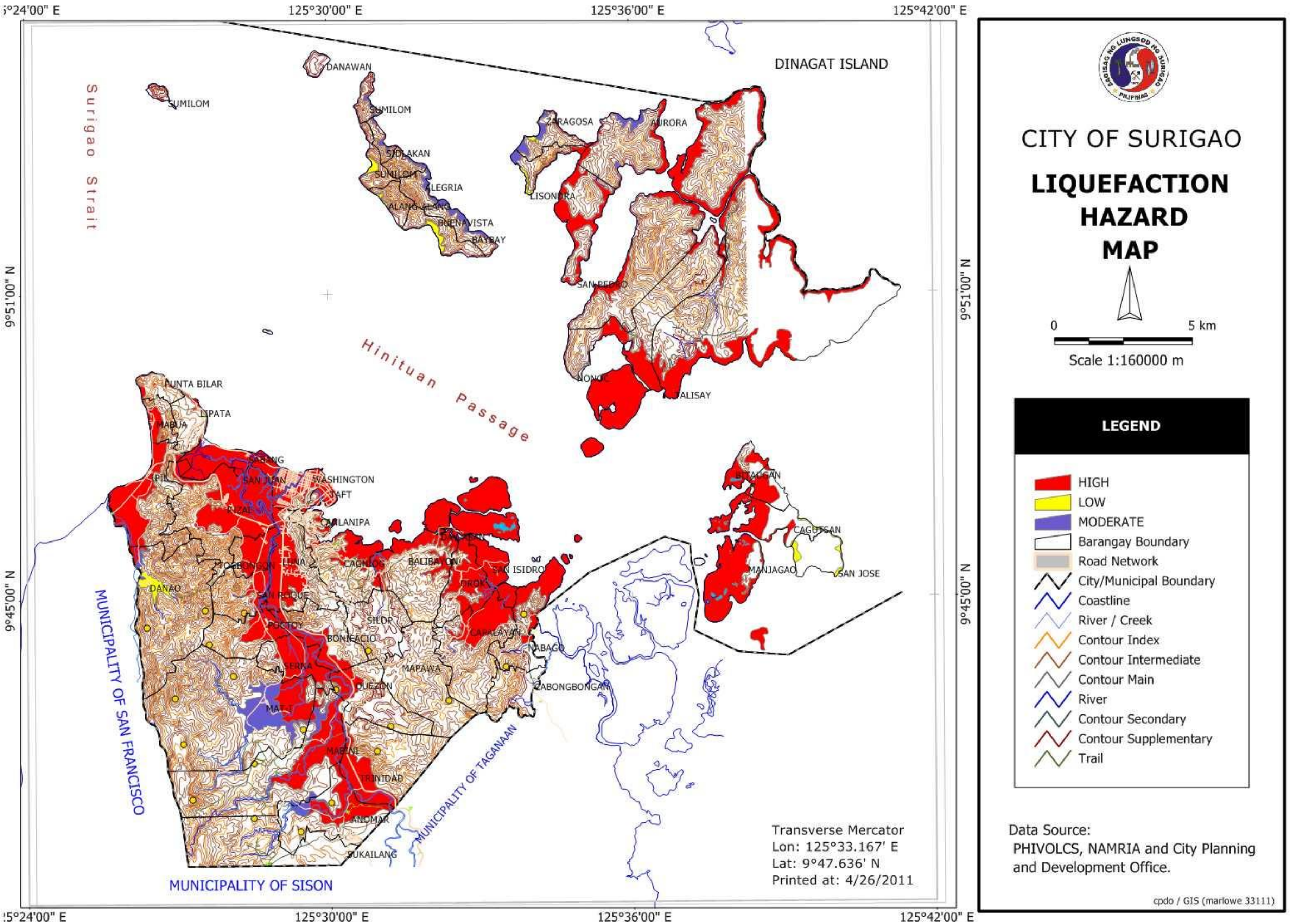
Scale 1:160000 m

LEGEND

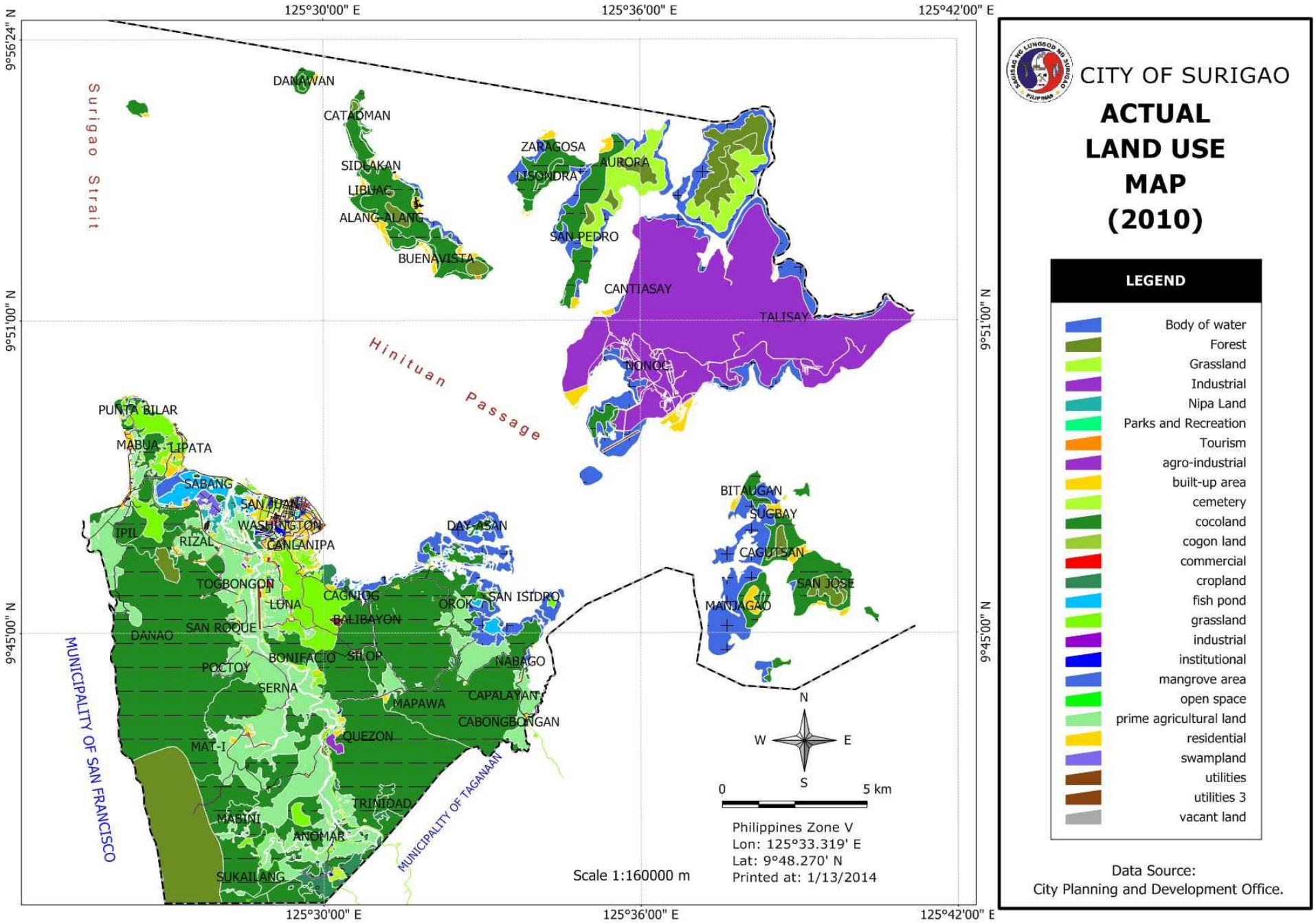
- Inundation of > 1m to 4m surges
- Barangay Boundary
- Road Network
- City/Municipal Boundary
- Coastline
- River / Creek
- Contour Index
- Contour Intermediate
- Contour Main
- River
- Contour Secondary
- Contour Supplementary
- Trail

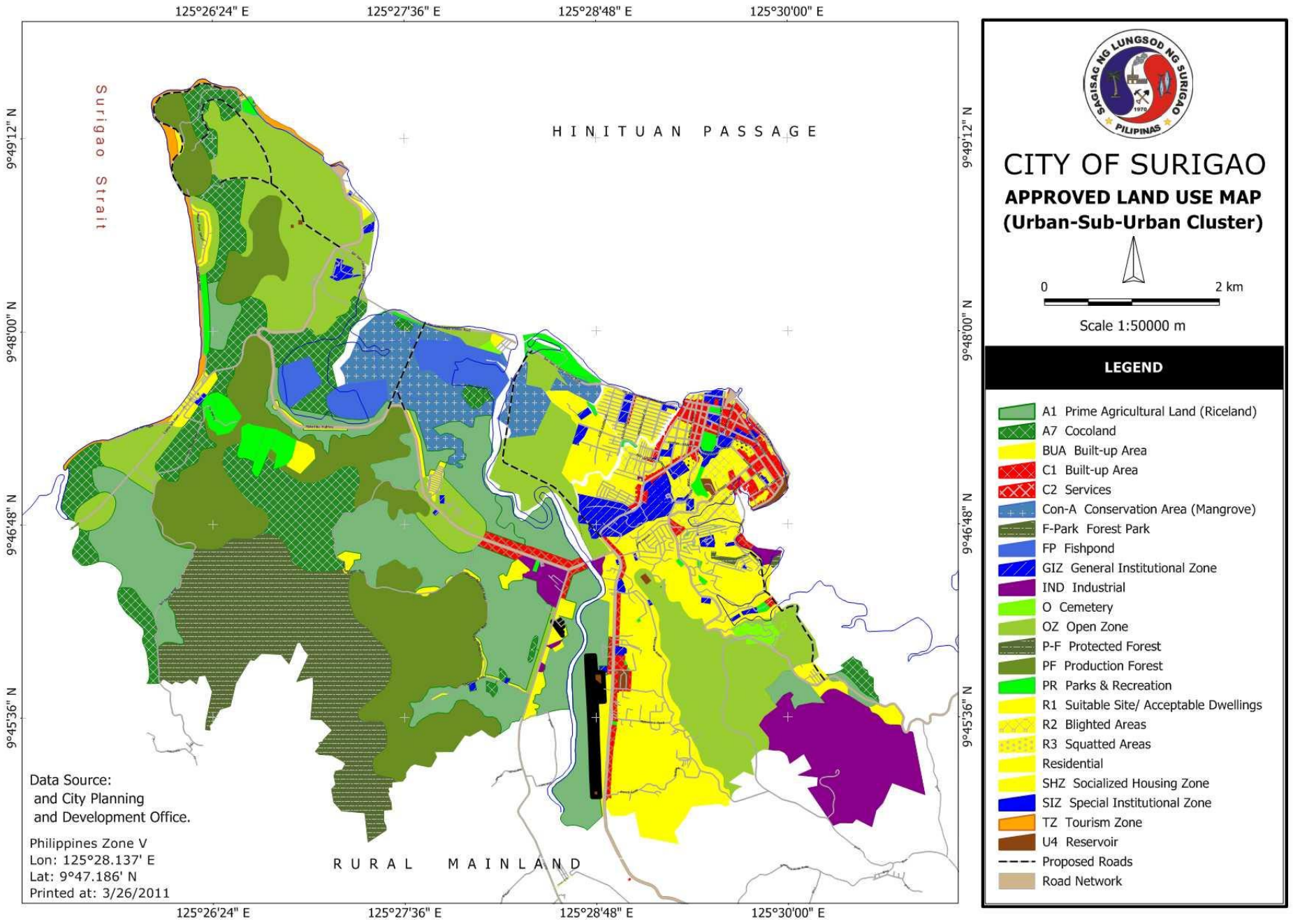
Data Source:
PHIVOLCS, NAMRIA and City Planning and Development Office.

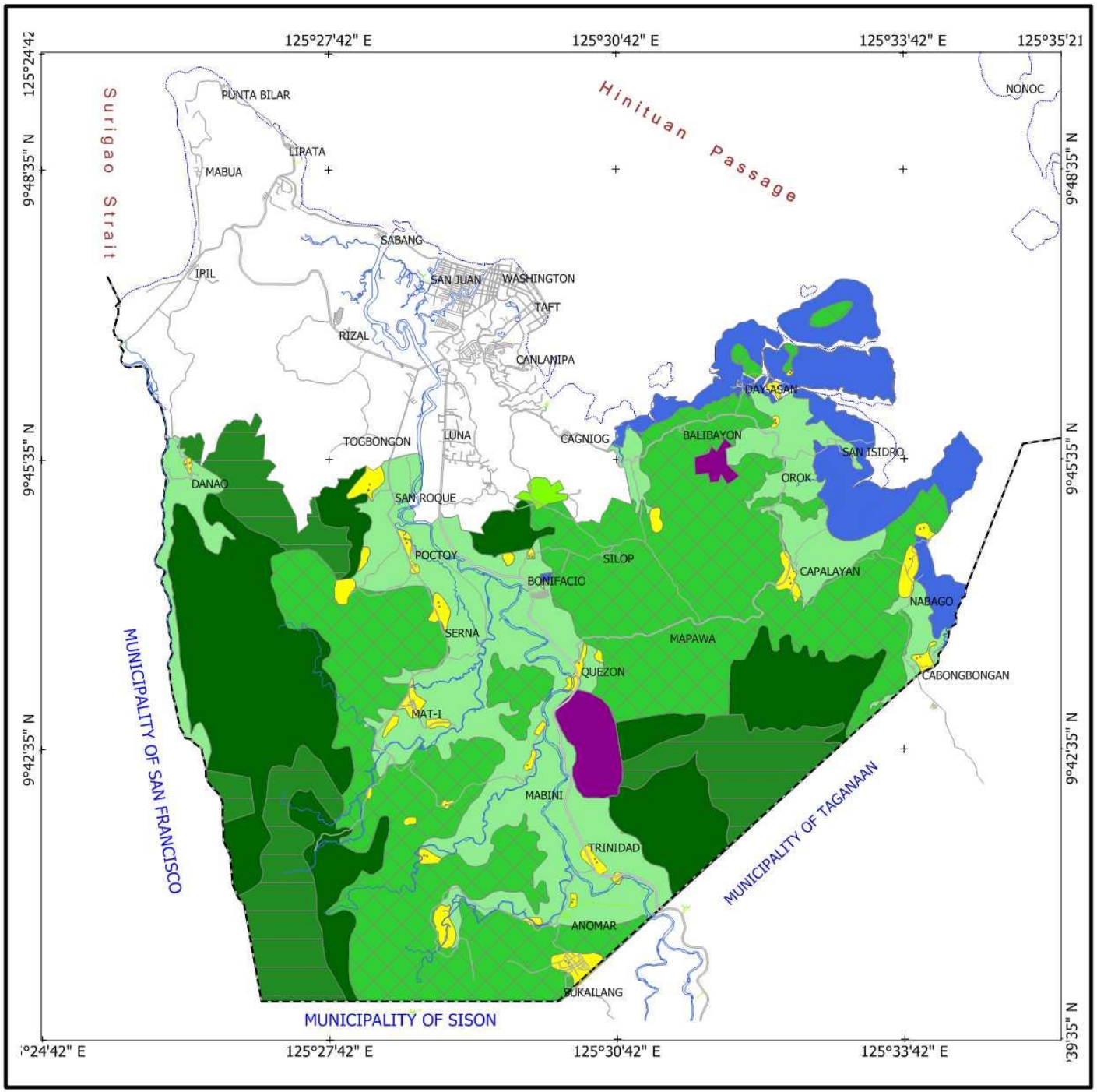
cpdo / GIS (marlowe 33111)



CITY OF SURIGAO
LIQUEFACTION HAZARD MAP
0
5 km
Scale 1:160000 m
LEGEND
HIGH
LOW
MODERATE
Barangay Boundary
Road Network
City/Municipal Boundary
Coastline
River / Creek
Contour Index
Contour Intermediate
Contour Main
River
Contour Secondary
Contour Supplementary
Trail
Data Source:
PHIVOLCS, NAMRIA and City Planning and Development Office.
cpdo / GIS (marlowe 33111)
Transverse Mercator
Lon: 125°33.167' E
Lat: 9°47.636' N
Printed at: 4/26/2011
125°30'00" E
125°36'00" E
125°42'00" E
9°51'00" N
9°45'00" N
DINAGAT ISLAND
Surigao Strait
Hinituan Passage
MUNICIPALITY OF SAN FRANCISCO
MUNICIPALITY OF SISON
MUNICIPALITY OF TAGANAAN
DANAWAN
SUMILOM
SIDLAKAN
ALEGRIA
BAYBAY
ZARAGOSA
AURORA
SAN PEDRO
ALISAY
PUNTA BILAR
LIPATA
WASHINGTON
TAFT
SAN JUAN
RIZAL
CAGNIOG
SAN ISIDRO
BONIFACIO
QUEZON
MAPAWA
CABONGBONGAN
TRINIDAD
ANOMAR
SUKAILANG
DANAO
MANJAGAO
SAN JOSE
CAGUTSAN


CITY OF SURIGAO
ACTUAL LAND USE MAP (2010)
LEGEND
Body of water
Forest
Grassland
Industrial
Nipa Land
Parks and Recreation
Tourism
agro-industrial
built-up area
cemetery
cocoland
cogon land
commercial
cropland
fish pond
grassland
industrial
institutional
mangrove area
open space
prime agricultural land
residential
swampland
utilities
utilities 3
vacant land
Data Source:
City Planning and Development Office.
125°30'00" E
125°36'00" E
125°42'00" E
9°56'24" N
9°51'00" N
9°45'00" N
Surigao Strait
Hinituan Passage
DANAWAN
CATADMAN
SIDLAKAN
LIBJAC
ALANG-ALANG
BUENAVISTA
ZARAGOSA
AURORA
LISONDRA
SAN PEDRO
CANTILASAY
TALISAY
MONOC
PUNTA BILAR
MABUA
LIPATA
SABANG
SAN JUAN
WASHINGTON
IPIL
RIZAL
CANLANIPA
DAY-ASAN
TOGBONGON
LUNA
CAGNIPA
OROK
SAN ISIDRO
BALIBAYON
SAN ROQUE
DANAO
BONIFACIO
SILOP
NABAGO
POCTOY
SERNA
MAPAWA
CAPALAYAN
CABONGBONGAN
QUEZON
MAT-I
TRINIDAD
MABINI
ANGMAR
SUKAILANG
MUNICIPALITY OF SAN FRANCISCO
MUNICIPALITY OF TAGANAAN
BITAUGAN
SUGBAY
CAGUTSAN
SAN JOSE
MANJAGAO
N
W
E
S
0
5 km
Scale 1:160000 m
Philippines Zone V
Lon: 125°33.319' E
Lat: 9°48.270' N
Printed at: 1/13/2014


125°26'24" E
125°27'36" E
125°28'48" E
125°30'00" E
9°49'12" N
9°48'00" N
9°46'48" N
9°45'36" N
Surigao Strait
HINITUAN PASSAGE
RURAL MAINLAND
Data Source:
and City Planning
and Development Office.
Philippines Zone V
Lon: 125°28.137' E
Lat: 9°47.186' N
Printed at: 3/26/2011
SAGISAG NG LUNGSOD NG SURIGAO
1970
PILIPINAS
CITY OF SURIGAO
APPROVED LAND USE MAP
(Urban-Sub-Urban Cluster)
0
2 km
Scale 1:50000 m
LEGEND
A1 Prime Agricultural Land (Riceland)
A7 Cocoland
BUA Built-up Area
C1 Built-up Area
C2 Services
Con-A Conservation Area (Mangrove)
F-Park Forest Park
FP Fishpond
GIZ General Institutional Zone
IND Industrial
O Cemetery
OZ Open Zone
P-F Protected Forest
PF Production Forest
PR Parks & Recreation
R1 Suitable Site/ Acceptable Dwellings
R2 Blighted Areas
R3 Squatted Areas
Residential
SHZ Socialized Housing Zone
SIZ Special Institutional Zone
TZ Tourism Zone
U4 Reservoir
Proposed Roads
Road Network



CITY OF SURIGAO

APPROVED LAND USE MAP (Rural mainland Cluster)

0 4 km

Scale 1:100000 m

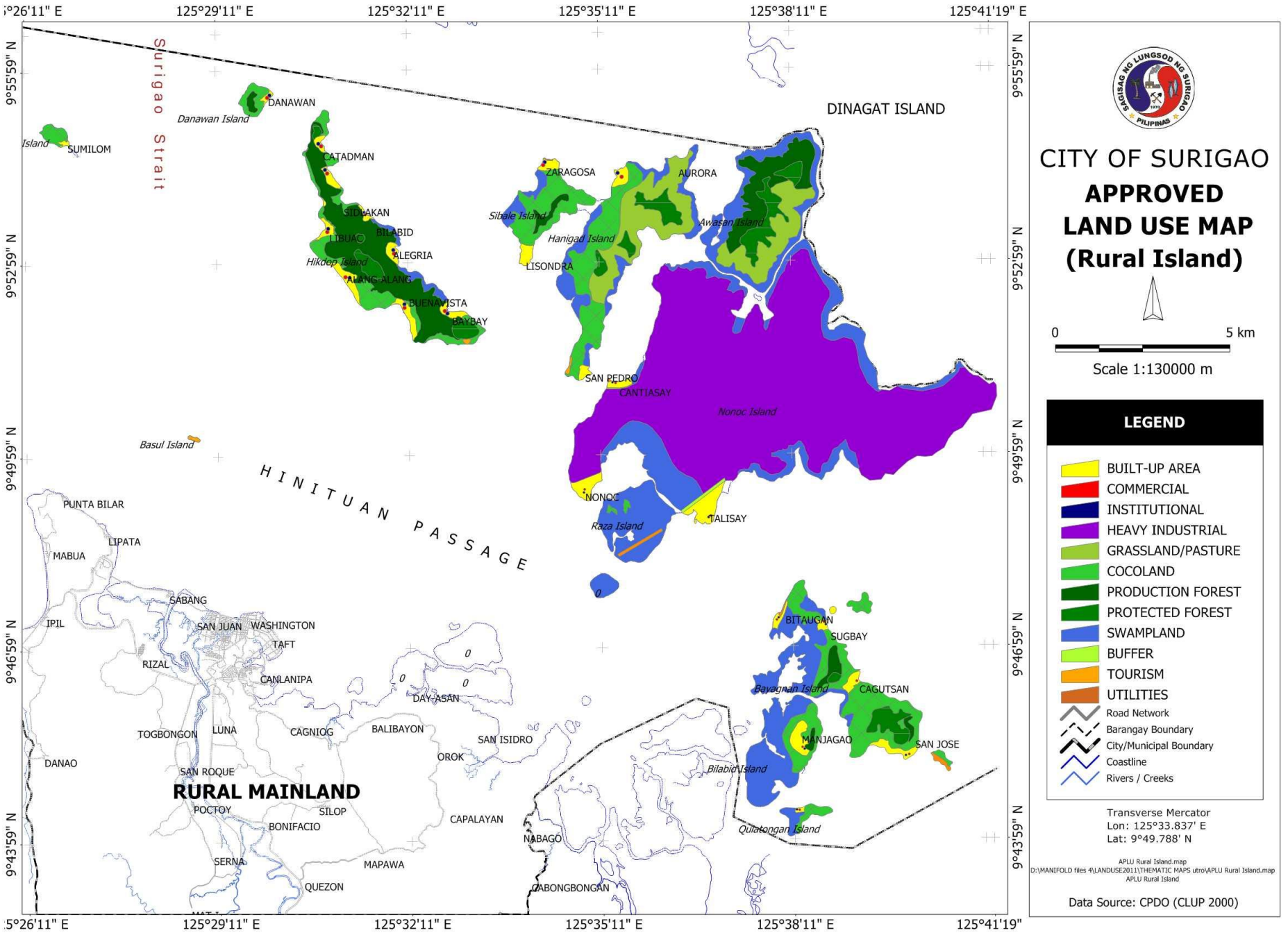
LEGEND

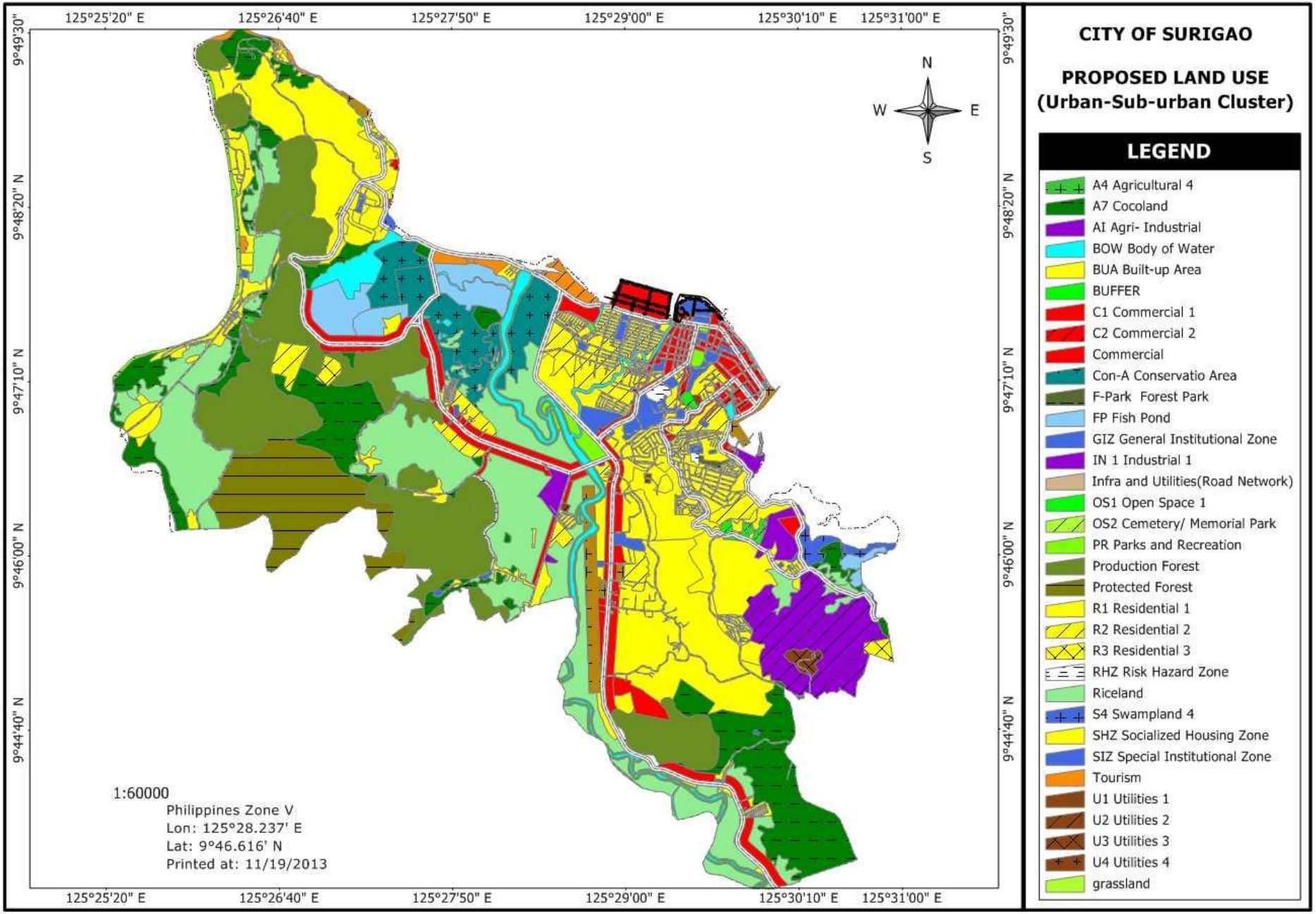
LANDUSE

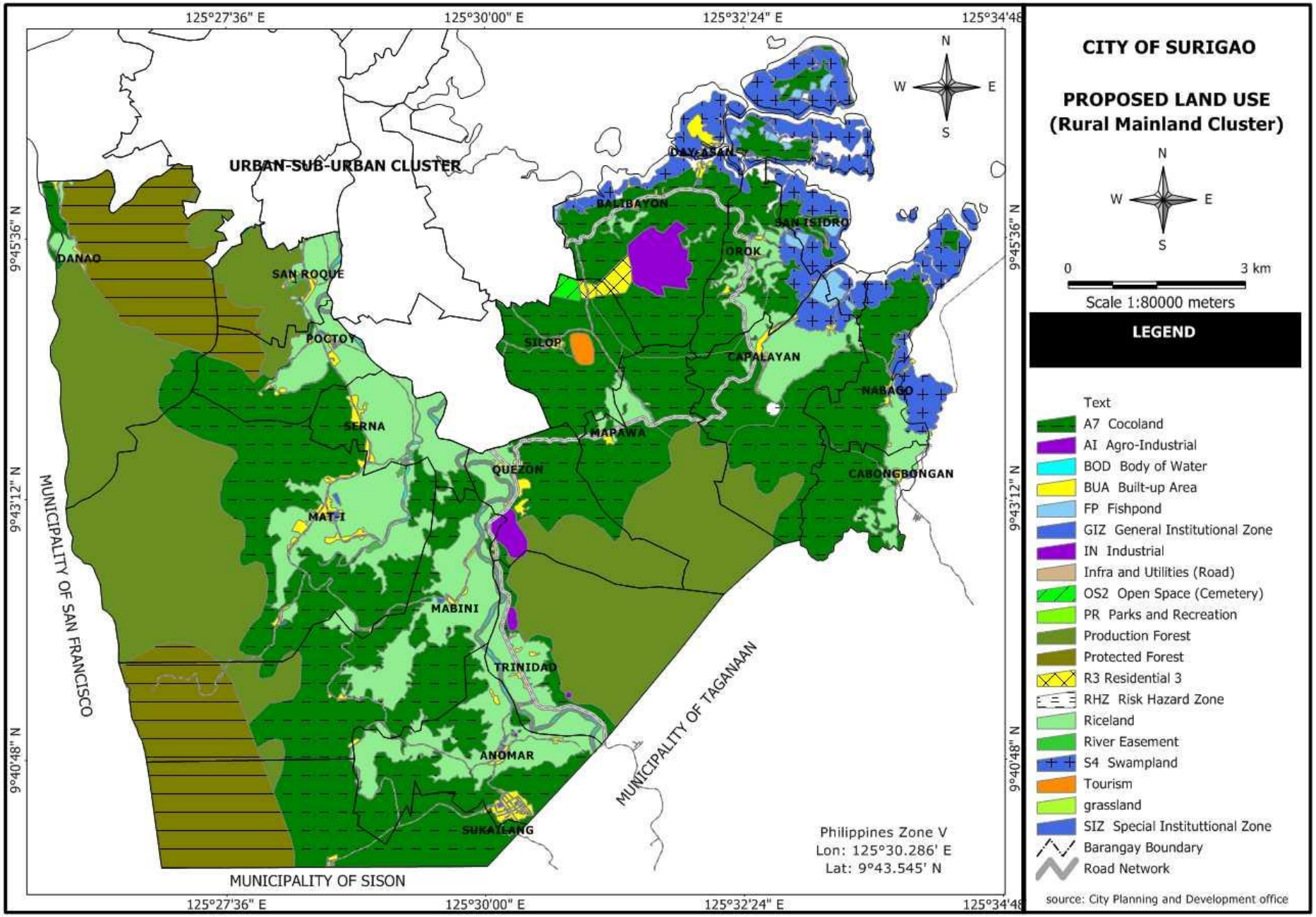
- BUILT-UP AREA
- COCOLAND
- COMMERCIAL
- GRASSLAND PASTURE
- HEAVY INDUSTRIAL
- INSTITUTIONAL
- PRIME AGRICULTURAL LAND
- PRODUCTION FOREST
- PROTECTED FOREST
- SWAMPLAND
- Road Network
- Coastline
- Rivers/Creeks
- City / Municipal Boundary

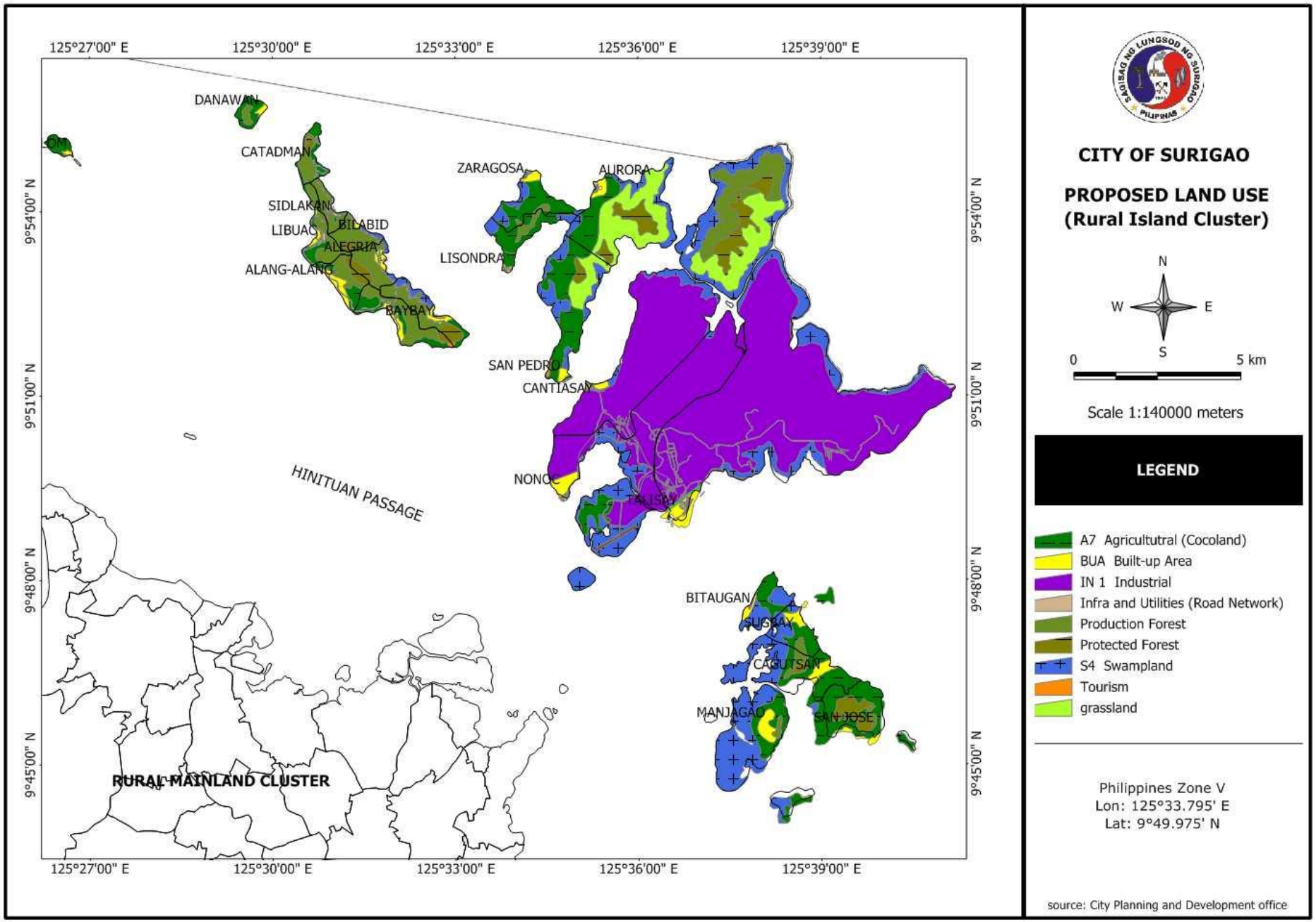
Data Source:
City Planning and Development O

Philippines Zone V
Lon: 125°30.013' E
Lat: 9°44.688' N
Printed at: 3/26/2011


125°26'11" E
125°29'11" E
125°32'11" E
125°35'11" E
125°38'11" E
125°41'19" E
9°55'59" N
9°52'59" N
9°49'59" N
9°46'59" N
9°43'59" N
Surigao Strait
DANAWAN
Danawan Island
SUMILOM
Island
CATADMAN
SIDLAKAN
BILABID
LIBUAC
ALEGRIA
Hikdop Island
ALANG-ALANG
BUENAVISTA
BAYBAY
DINAGAT ISLAND
ZARAGOSA
AURORA
Sibale Island
Hanigad Island
Awasan Island
LISONDRA
SAN PEDRO
CANTIASAY
Nonoc Island
NONOC
TALISAY
Raza Island
Basul Island
HINITUAN PASSAGE
PUNTA BILAR
LIPATA
MABUA
SABANG
IPIL
SAN JUAN
WASHINGTON
TAFT
RIZAL
CANLANIPA
DAY-ASAN
TOGBONGON
LUNA
CAGNIOG
BALIBAYON
SAN ISIDRO
OROK
DANAO
SAN ROQUE
RURAL MAINLAND
POCTOY
SILOP
BONIFACIO
CAPALAYAN
SERNA
MAPAWA
QUEZON
NABAGO
CABONGBONGAN
BITAUGAN
SUGBAY
Bayagnan Island
CAGUTSAN
MANJAGAO
SAN JOSE
Bilabid Island
Quilatongan Island
CITY OF SURIGAO
APPROVED
LAND USE MAP
(Rural Island)
0
5 km
Scale 1:130000 m
LEGEND
BUILT-UP AREA
COMMERCIAL
INSTITUTIONAL
HEAVY INDUSTRIAL
GRASSLAND/PASTURE
COCOLAND
PRODUCTION FOREST
PROTECTED FOREST
SWAMPLAND
BUFFER
TOURISM
UTILITIES
Road Network
Barangay Boundary
City/Municipal Boundary
Coastline
Rivers / Creeks
Transverse Mercator
Lon: 125°33.837' E
Lat: 9°49.788' N
APLU Rural Island.map
D:\MANIFOLD files 4\LANDUSE2011\THEMATIC MAPS utro\APLU Rural Island.map
APLU Rural Island
Data Source: CPDO (CLUP 2000)


125°25'20" E
125°26'40" E
125°27'50" E
125°29'00" E
125°30'10" E
125°31'00" E
9°49'30"
9°48'20" N
9°47'10" N
9°46'00" N
9°44'40" N
N
W
E
S
1:60000
Philippines Zone V
Lon: 125°28.237' E
Lat: 9°46.616' N
Printed at: 11/19/2013
CITY OF SURIGAO
PROPOSED LAND USE
(Urban-Sub-urban Cluster)
LEGEND
A4 Agricultural 4
A7 Cocoland
AI Agri- Industrial
BOW Body of Water
BUA Built-up Area
BUFFER
C1 Commercial 1
C2 Commercial 2
Commercial
Con-A Conservatio Area
F-Park Forest Park
FP Fish Pond
GIZ General Institutional Zone
IN 1 Industrial 1
Infra and Utilities(Road Network)
OS1 Open Space 1
OS2 Cemetery/ Memorial Park
PR Parks and Recreation
Production Forest
Protected Forest
R1 Residential 1
R2 Residential 2
R3 Residential 3
RHZ Risk Hazard Zone
Riceland
S4 Swampland 4
SHZ Socialized Housing Zone
SIZ Special Institutional Zone
Tourism
U1 Utilities 1
U2 Utilities 2
U3 Utilities 3
U4 Utilities 4
grassland


125°27'36" E
125°30'00" E
125°32'24" E
125°34'48
9°45'36" N
9°43'12" N
9°40'48" N
URBAN-SUB-URBAN CLUSTER
DANAO
SAN ROQUE
POCTOY
SERNA
MAT-I
MABINI
TRINIDAD
ANOMAR
SUKAILANG
BALIBAYON
DAY-ASAN
SAN ISIDRO
OROK
SILOP
CAPALAYAN
NABAGO
MAPAWA
QUEZON
CABONGBONGAN
MUNICIPALITY OF SAN FRANCISCO
MUNICIPALITY OF TAGANAAN
MUNICIPALITY OF SISON
Philippines Zone V
Lon: 125°30.286' E
Lat: 9°43.545' N
N
W
E
S
CITY OF SURIGAO
PROPOSED LAND USE
(Rural Mainland Cluster)
0
3 km
Scale 1:80000 meters
LEGEND
Text
A7 Cocoland
AI Agro-Industrial
BOD Body of Water
BUA Built-up Area
FP Fishpond
GIZ General Institutional Zone
IN Industrial
Infra and Utilities (Road)
OS2 Open Space (Cemetery)
PR Parks and Recreation
Production Forest
Protected Forest
R3 Residential 3
RHZ Risk Hazard Zone
Riceland
River Easement
S4 Swampland
Tourism
grassland
SIZ Special Instituttional Zone
Barangay Boundary
Road Network
source: City Planning and Development office


125°27'00" E
125°30'00" E
125°33'00" E
125°36'00" E
125°39'00" E
9°54'00" N
9°51'00" N
9°48'00" N
9°45'00" N
DANAWAN
CATADMAN
SIDLAKAN
LIBUAC
BILABID
ALEGRIA
ALANG-ALANG
BAYBAY
ZARAGOSA
AURORA
LISONDRA
SAN PEDRO
CANTIASAN
NONOC
TALISAY
HINITUAN PASSAGE
BITAUGAN
SUGBAY
CAGUTSAN
MANJAGAO
SAN JOSE
RURAL MAINLAND CLUSTER
CITY OF SURIGAO
PROPOSED LAND USE
(Rural Island Cluster)
N
W
E
S
0
5 km
Scale 1:140000 meters
LEGEND
A7 Agricultutral (Cocoland)
BUA Built-up Area
IN 1 Industrial
Infra and Utilities (Road Network)
Production Forest
Protected Forest
S4 Swampland
Tourism
grassland
Philippines Zone V
Lon: 125°33.795' E
Lat: 9°49.975' N
source: City Planning and Development office