Environmental Impact Assessment

Project Number: 52320-002
July 2021
Final

Timor-Leste: Presidente Nicolau Lobato International Airport Expansion Project

Volume 2 Appendices (Part 2)

Prepared by the Ministry of Transport and Communications and the Asian Development Bank.

Appendix C – Hydrodynamic Model

1. Purpose of Analysis

In order to assess impacts of beach changes by sediment plume due to the airport expansion project, prediction of beach changes is carried out using hydrodynamics plume modeling.

2. Outline of Analysis

- Calculation Model : BG Model (A model for three-dimensional beach changes based on Bagnold's concept) This model calculates beach changes caused by longshore sediment due to wave action (waves and coastal currents caused by waves). This model replaces the terrain with linear parallel coastlines for calculations.
- Condition of Calculation : As shown in the condition table
- High ocean wave which is equivalent to 1% of exceedance occurrence frequency of the ocean wave is applied as ocean wave condition.
- Two cases, namely, Case 1 : WNW and Case 2 : N, are calculated as predominant wave direction condition considering that the directions of sediment transport are variable according to wave directions.
- Duration of prediction : Equivalent to 10 years

3. Result of Calculation

The results of the calculation are shown in Figure-1 to Figure-10.

(1) Case 1: Wave direction WNW

The sediment transport from west is disturbed by the airport land. Deposition at the westside of the airport and erosion at the eastside of the airport are predicted as beach changes (Figure-2 and Figure -3).

The extent of impact of beach changes in direction of the shoreline is 400m for west and 500m for east from the edge of the airport land jutted out into the sea as X=0m (Figure-3).

The shoreline at the westside of the airport develop, and its maximum distance is 28m at the adjacent part of the airport. The extent of impact of shore changes in direction of the shoreline is 400 m from the airport (Figure-4). The shoreline at the eastside of the airport recede, and its maximum distance is 15m at the adjacent part of the airport. The extent of impact of shore change in direction of the shoreline is 500 m from the airport (Figure-4).

(2) Case 2: Wave direction N

The sediment transport from east is disturbed by the airport land. Deposition at the eastside of the airport and erosion at the westside of the airport are predicted as beach changes (Figure-5 and Figure-6).

The extent of impact of beach changes in direction of the shoreline is 400m for east and 400m for west from the airport (Figure-6).

The shoreline at the eastside of the airport develop, and its maximum distance is 28m at the adjacent part of the airport. The extent of impact of shore changes in direction of the shoreline is 400 m from the airport. The shoreline at the westside of the airport recede, and its maximum distance is 13m at the adjacent part of the airport. The extent of impact of shore change in direction of the shoreline is 400 m from the airport (Figure-7).

(3) Conclusion of Beach Changes

The summary of shoreline changes in Case-1 and Case-2 is shown in Figure-8. The extent of impact in direction of the shoreline is 400 m for west and 500 m for east, and there is no impact outside of the extent. The coral habitat is located at the coast at about 500m west from the airport. According to the calculation result, there are no beach changes in the coral habitat.

Conditions of Calculation

Calculation Model	BG Model (A model for three-dimensional beach changes based on Bagnold's concept)
Calculation Area	Shoreline direction 3,000 m x coast-offing direction 400 m
Initial Terrain	The airport land jutted out into the sea is set on a terrain modelized as linear parallel isobath (bottom gradient = 1/20) See in Page-3
Cases for Calculation	Case 1: Wave direction WNW Case 2: Wave direction N
Duration for Calculation	Equivalent to 10 years
Conditions of Incident Wave	Incident Wave height: H=0.5 m (High ocean wave which is equivalent to 1% of exceedance occurrence frequency of the ocean wave) Period T=3.5 s Wave Direction Case 1: WNW, Case 2: N
Space Mesh	ΔX = 20m, ΔY = 20m
Coefficient of Sediment Transport Load	Coefficient of Sediment Transport Load for Shoreline Direction: K_y =0.385 Coefficient of Sediment Transport Load for Off-shoring Direction: K_x =0.2 K_y Coefficient of Ozasa and Brampton: K_2=1.62K_y
Note	· Incident wave height H=0.5 m is the high ocean wave which is equivalent to 1% of exceedance occurrence frequency of the ocean wave at the point near the airport. Period T=3.5s is the period for this wave height. (Wave occurrence frequency is based on the result of wave estimation by NOAA from 1980 to 2014.)

Modeling

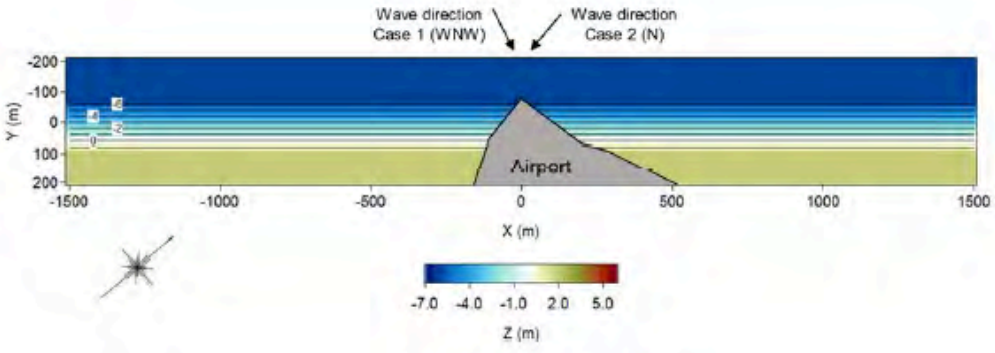


Figure-1 Initial Terrain

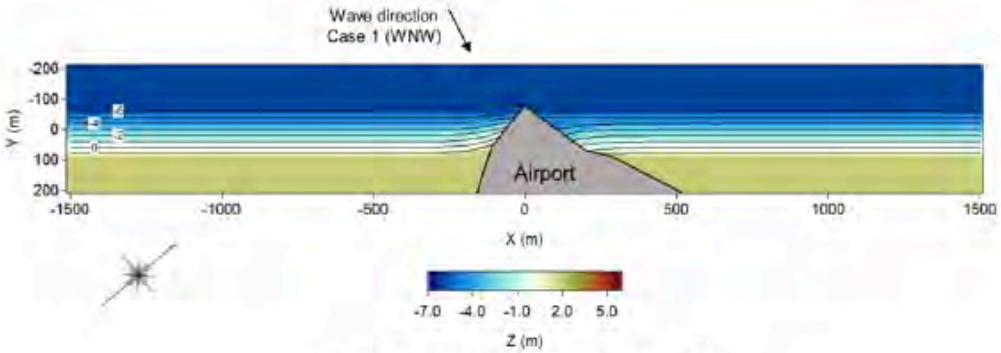


Figure-2 Predicted Terrain (Case1)

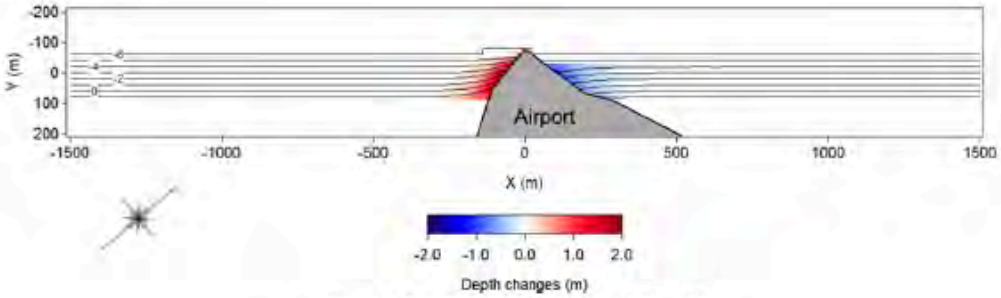


Figure-3 Terrain Changes (Case1)

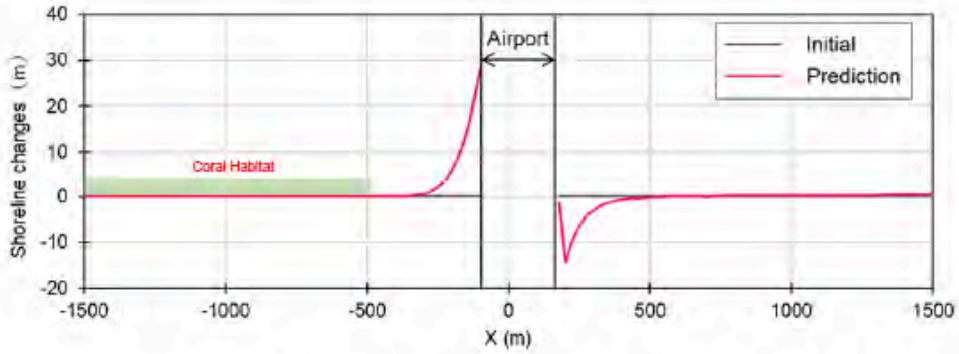


Figure-4 Shoreline Changes (Case1)

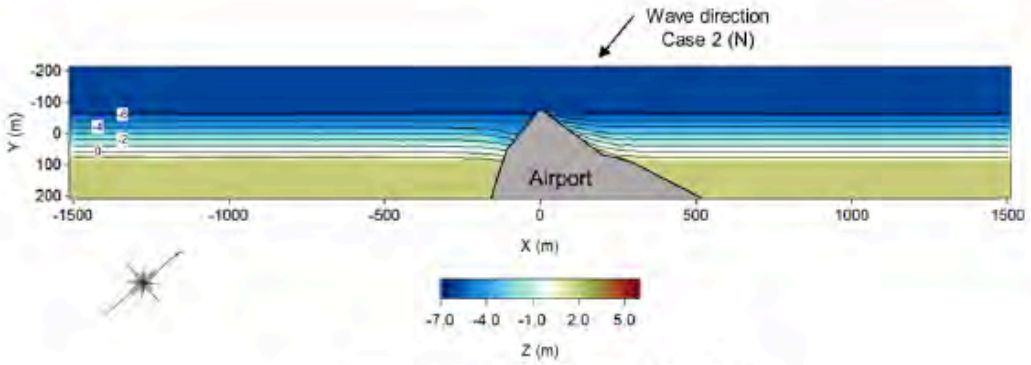


Figure-5 Predicted Terrain（Case2）

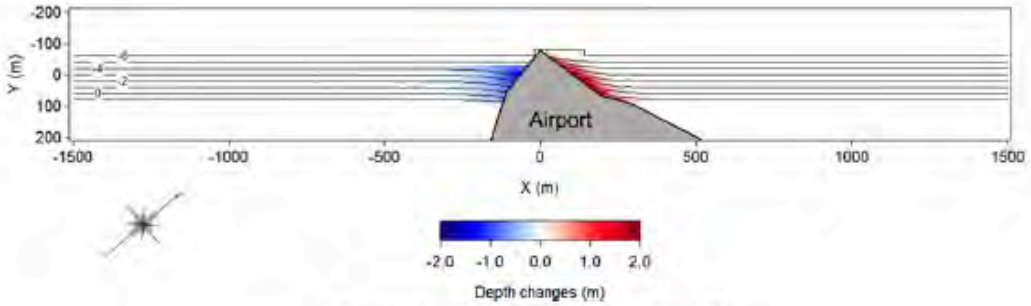


Figure-6 Terrain Changes（Case2）

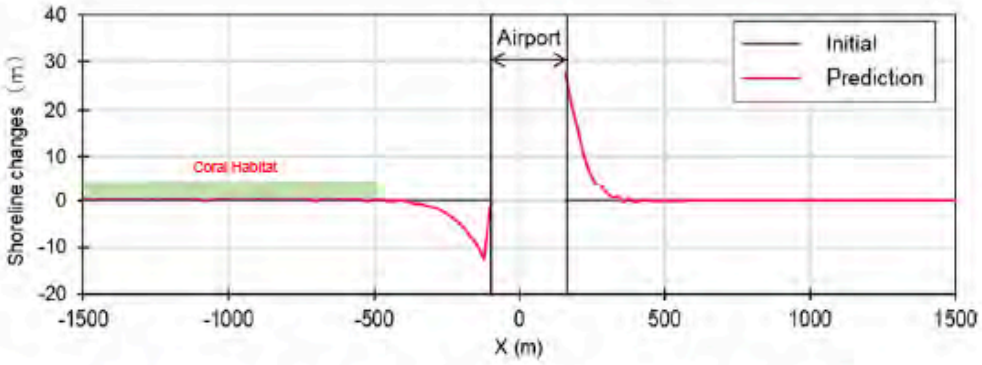


Figure-7 Shoreline Changes（Case2）

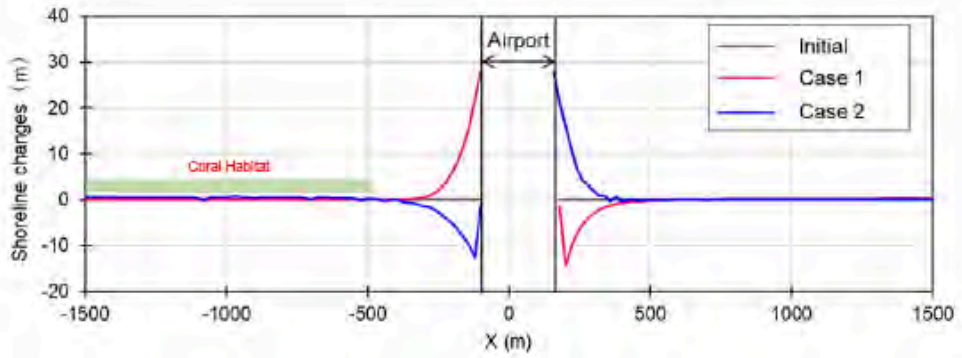
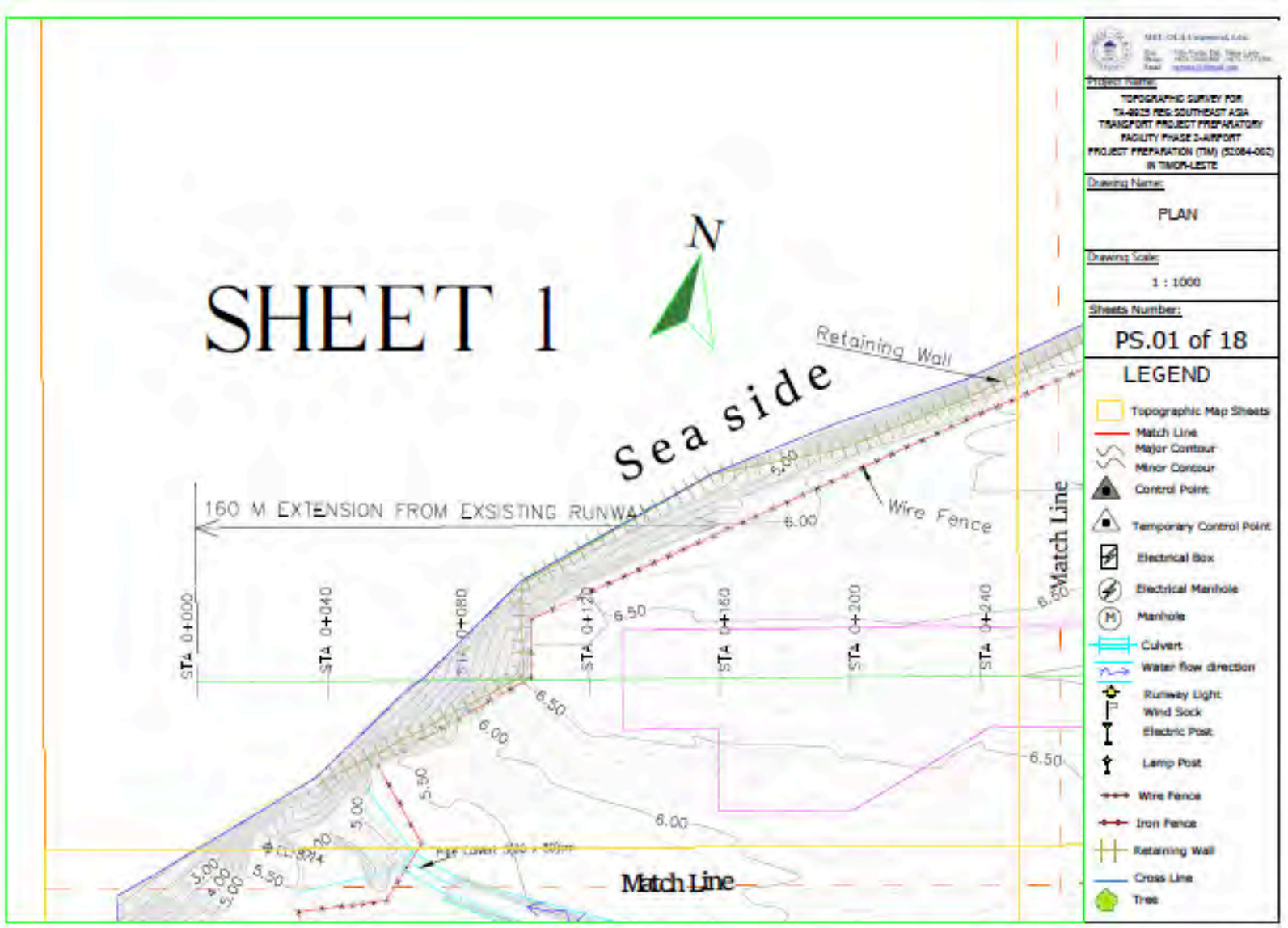


Figure-8 Shoreline Changes (Case1, Case2)

Appendix D - Mapping

PNLIA Topographical Maps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Sea side
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Match Line
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STA 0+040
STA 0+080
STA 0+120
STA 0+160
STA 0+200
STA 0+240
6.00
6.50
5.50
5.00
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Topographic Map Sheets
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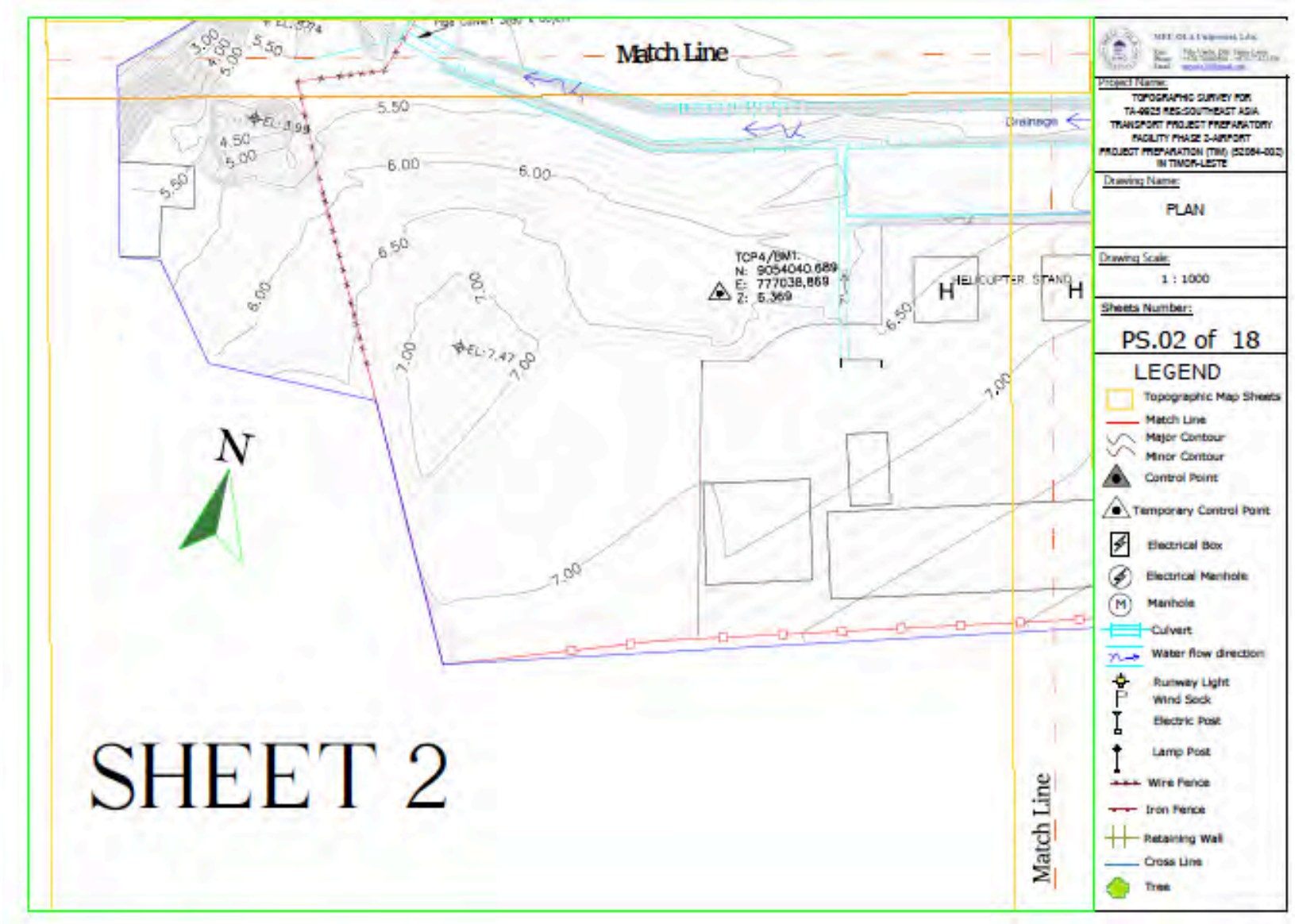
Major Contour
Minor Contour
Control Point
Temporary Control Point
Electrical Box
Electrical Manhole
Manhole
Culvert
Water flow direction
Runway Light
Wind Sock
Electric Post
Lamp Post
Wire Fence
Iron Fence
Retaining Wall
Cross Line
Tree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E: 777038.869
Z: 5.369
HELICOPTER STAND
H
H
N
SHEET 2
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Control Point
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Iron Fence
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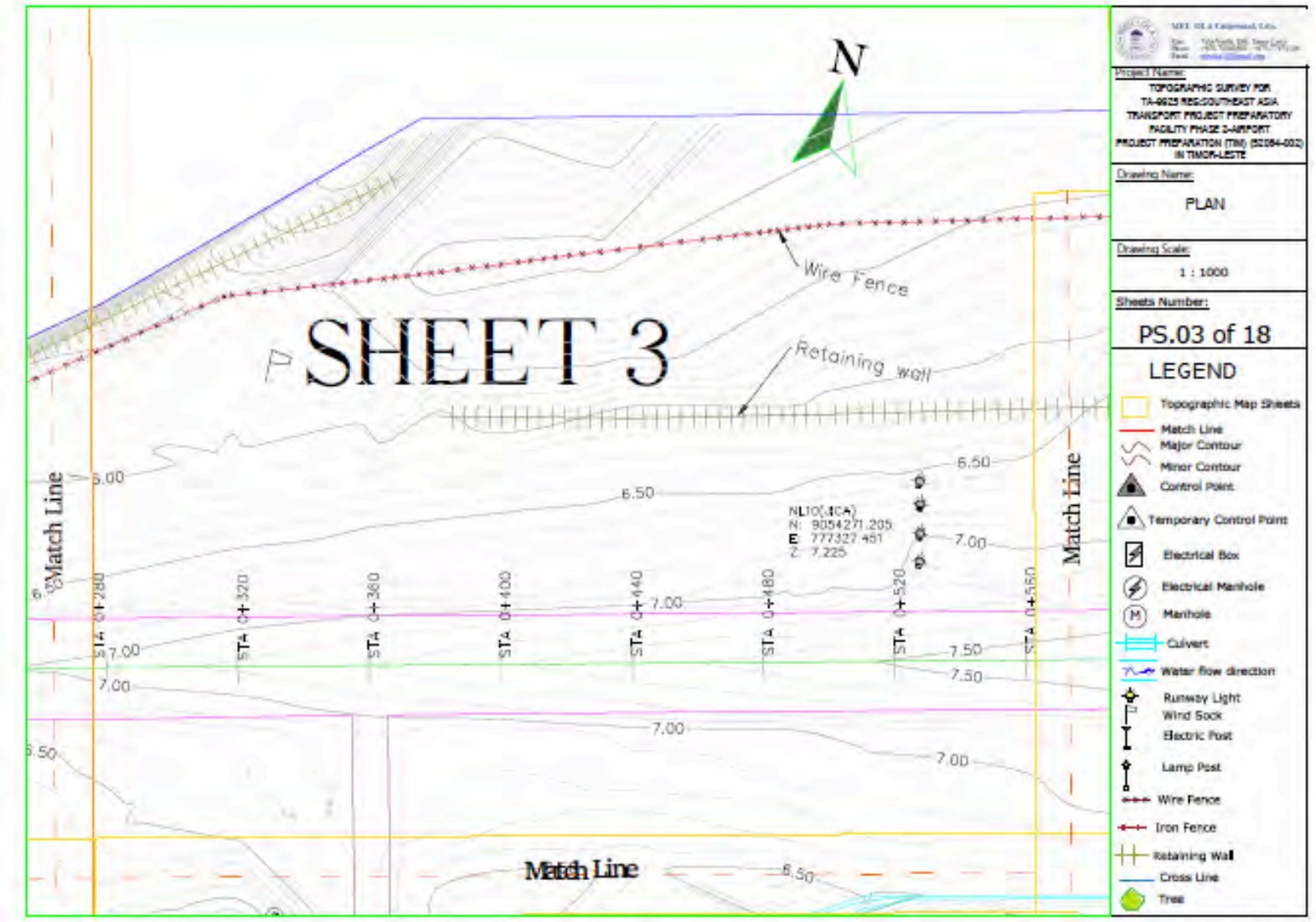
Cross Line
Tree


N
SHEET 3
Wire Fence
Retaining wall
Match Line
Match Line
Match Line
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6.50
6.50
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6.50
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NL10(ICA)
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E: 777327.451
Z: 7.225
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STA 0+320
STA 0+360
STA 0+400
STA 0+440
STA 0+480
STA 0+520
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Control Point
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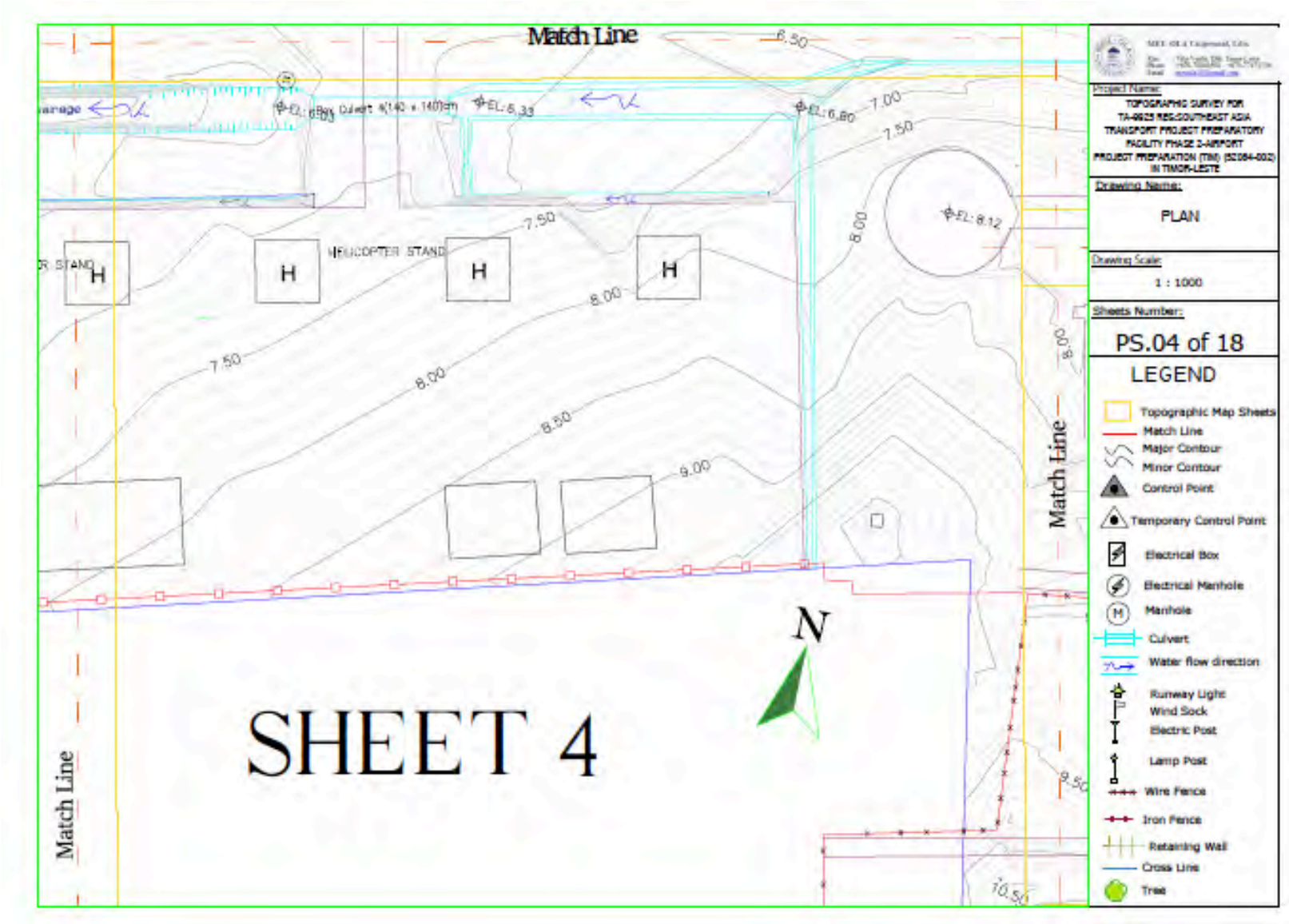
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SHEET 4
N
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Match Line
Match Line
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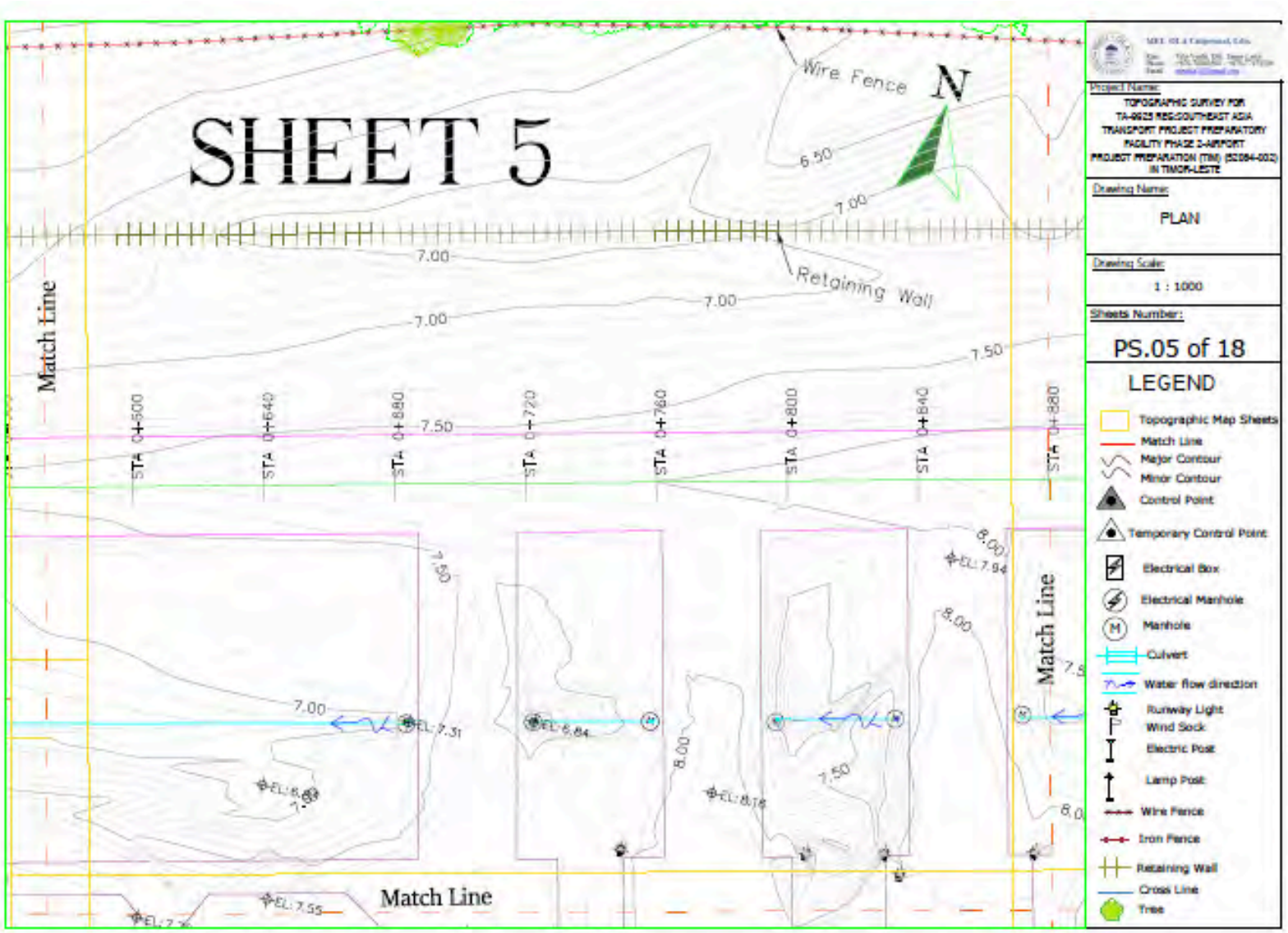
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N
Retaining Wall
Match Line
Match Line
Match Line
7.00
7.50
6.50
8.00
STA 0+500
STA 0+640
STA 0+680
STA 0+720
STA 0+760
STA 0+800
STA 0+840
STA 0+880
EL: 7.31
EL: 8.84
EL: 8.76
EL: 7.94
EL: 7.55
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Control Point
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Cross Line
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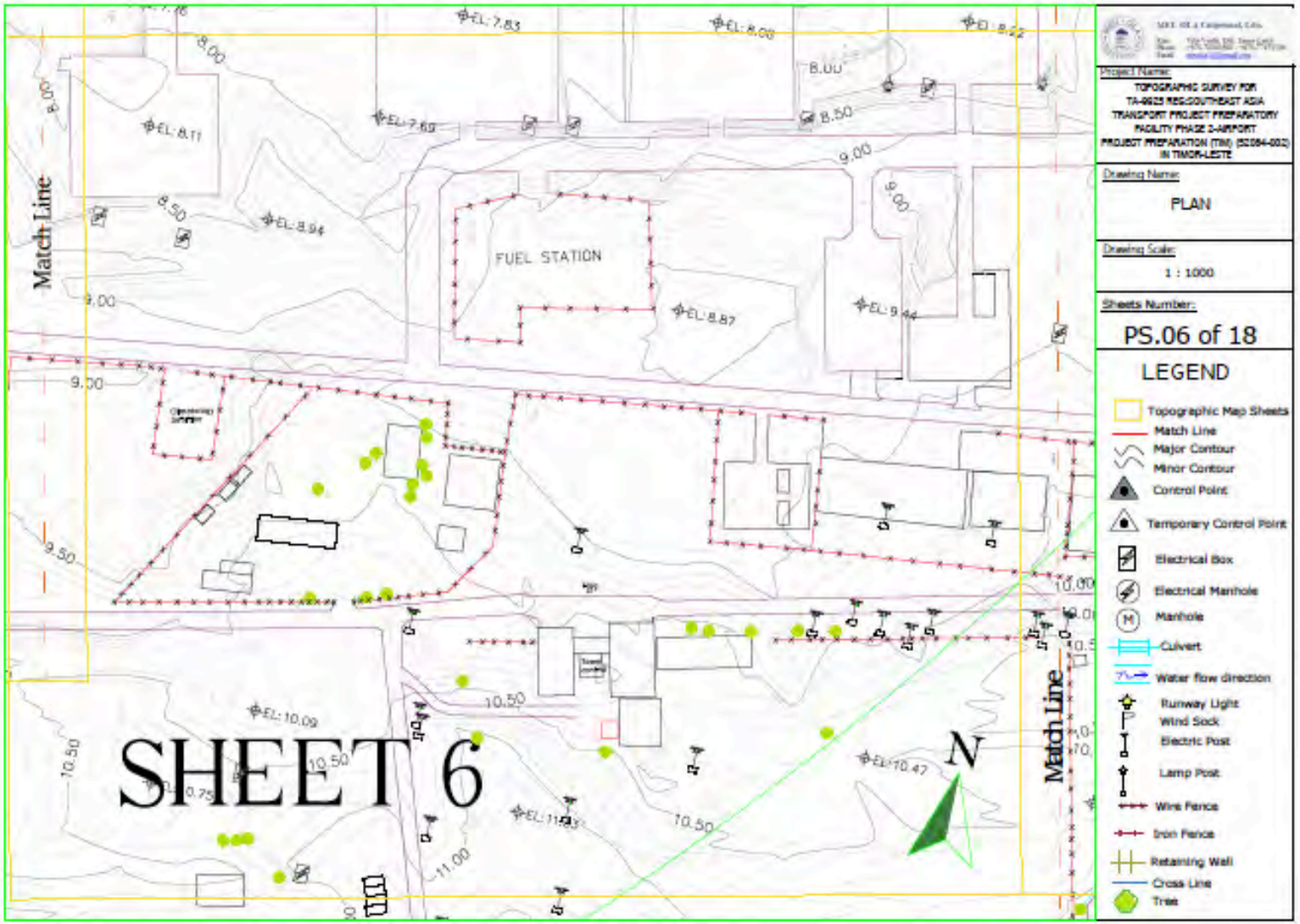
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Match Line
FUEL STATION
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Control Point
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Cross Line
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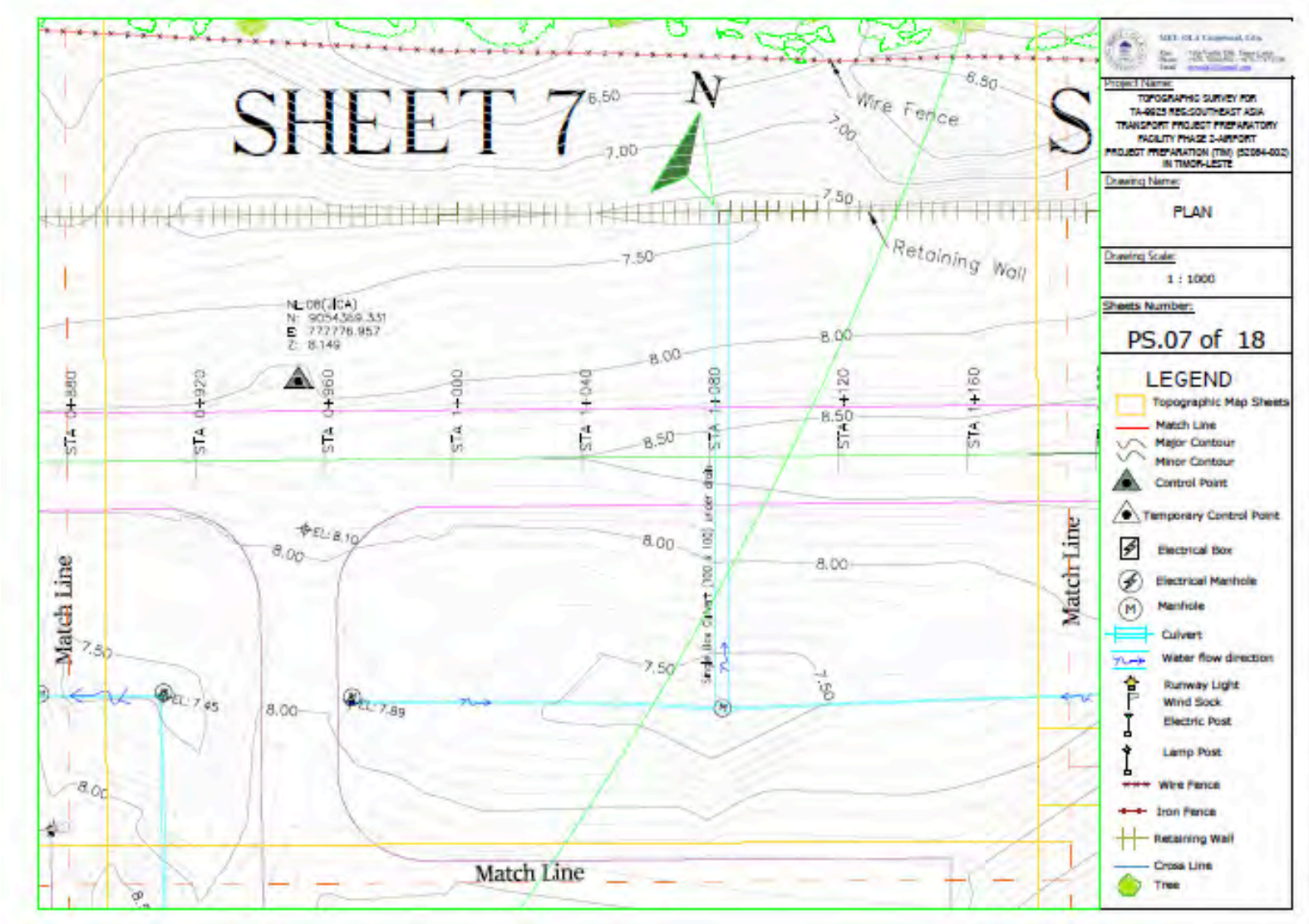
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S
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Retaining Wall
Match Line
Match Line
Match Line
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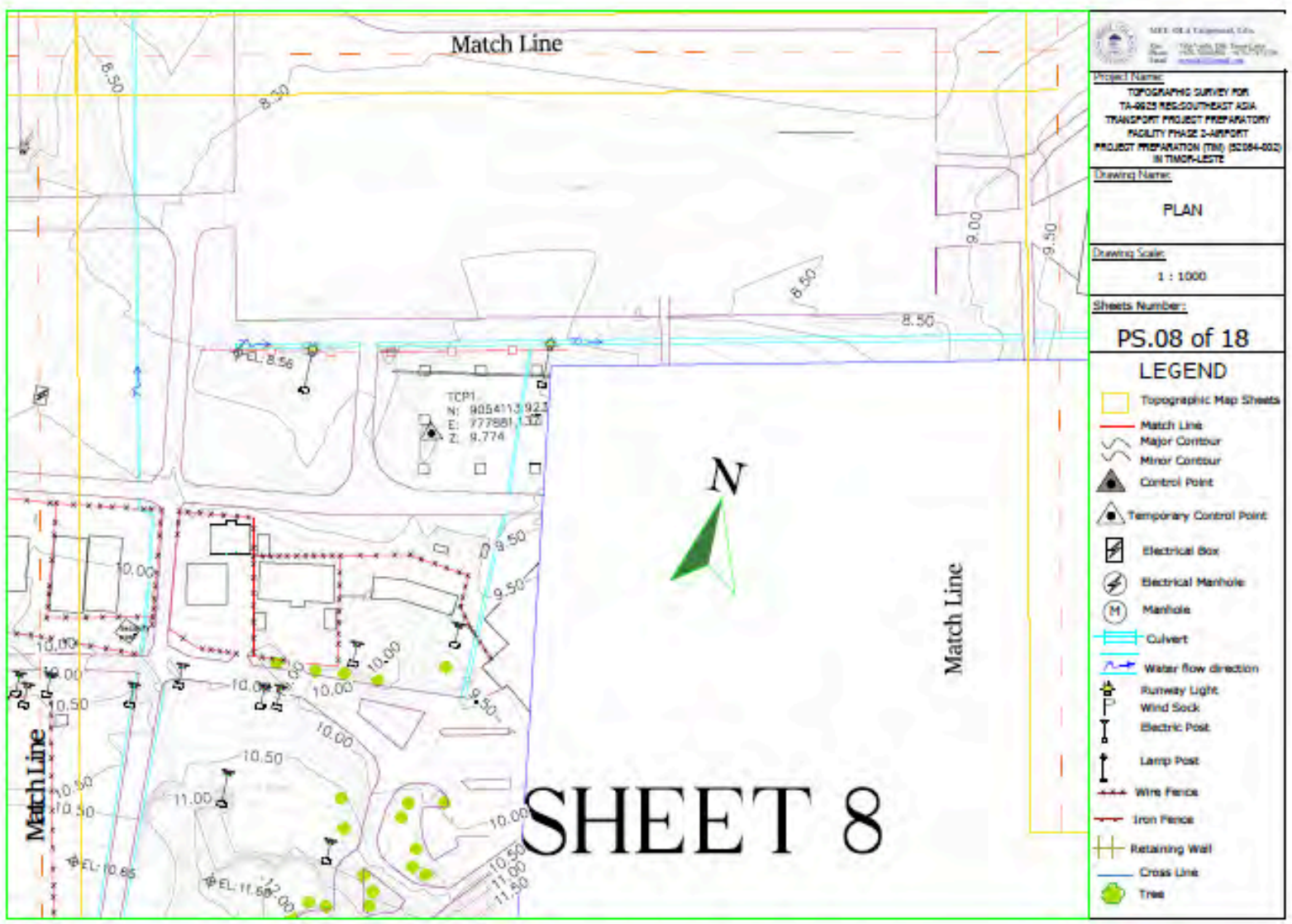
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Match Line
Match Line
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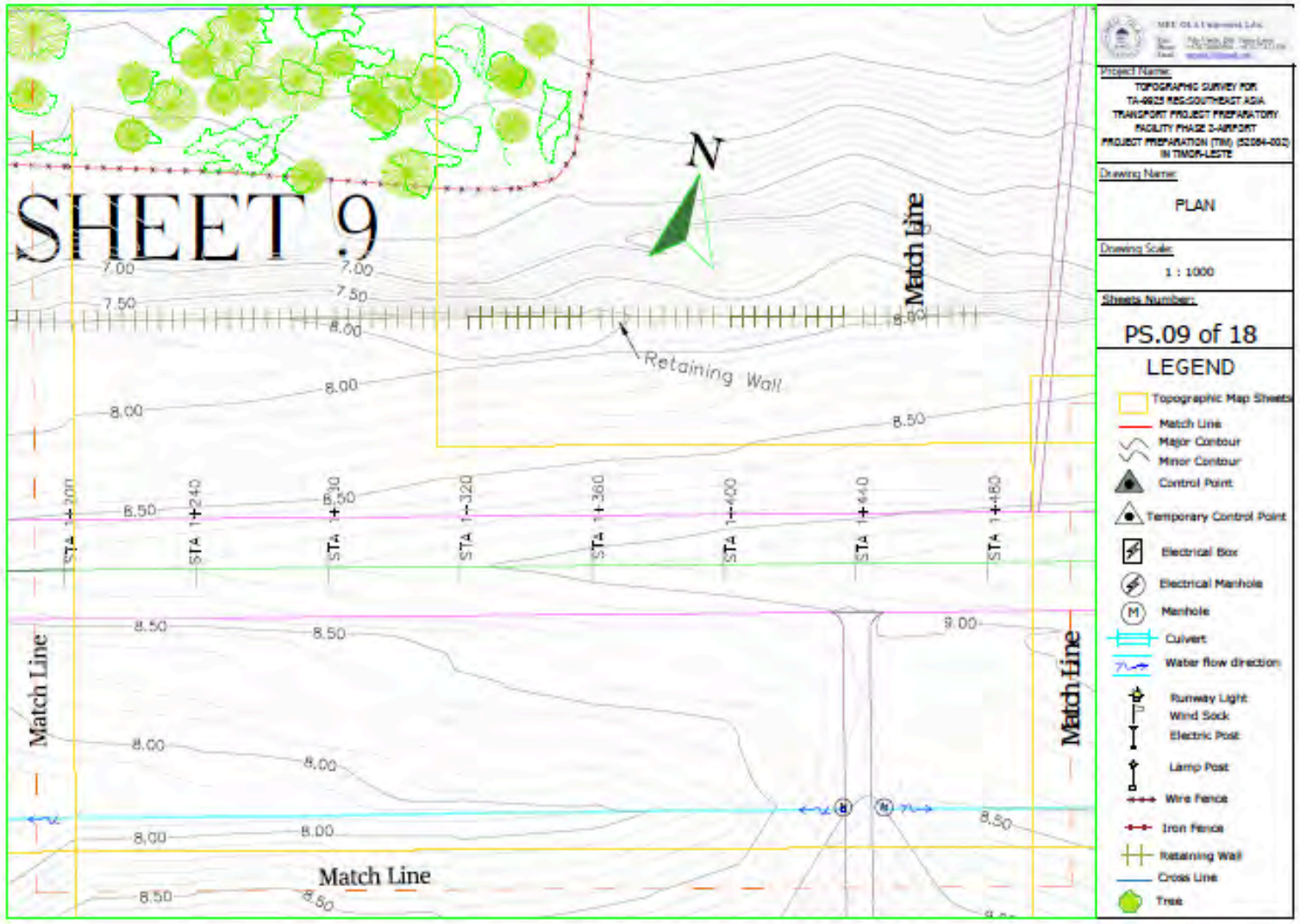
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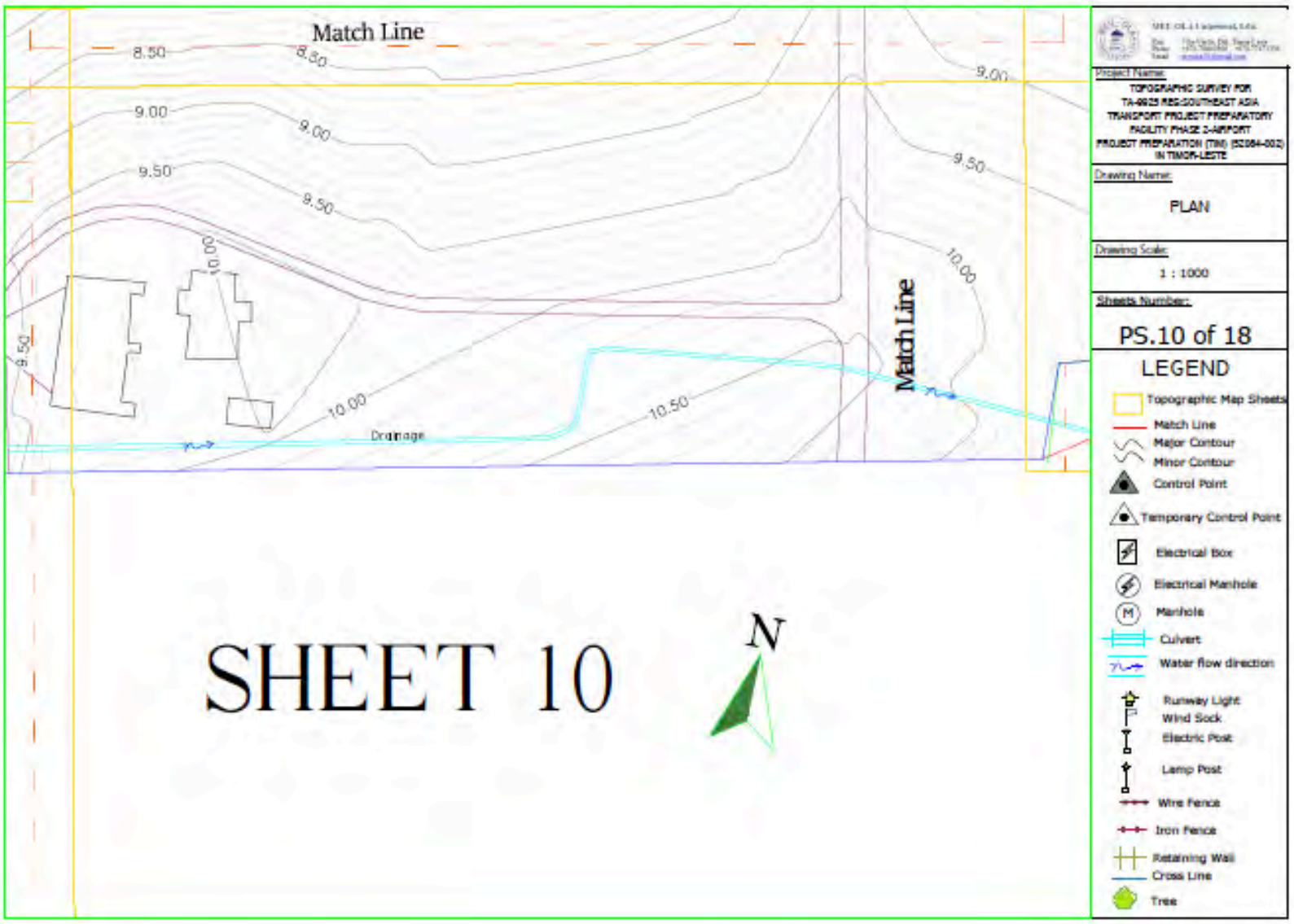
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9.50
10.00
10.50
Drainage
Match Line
SHEET 10
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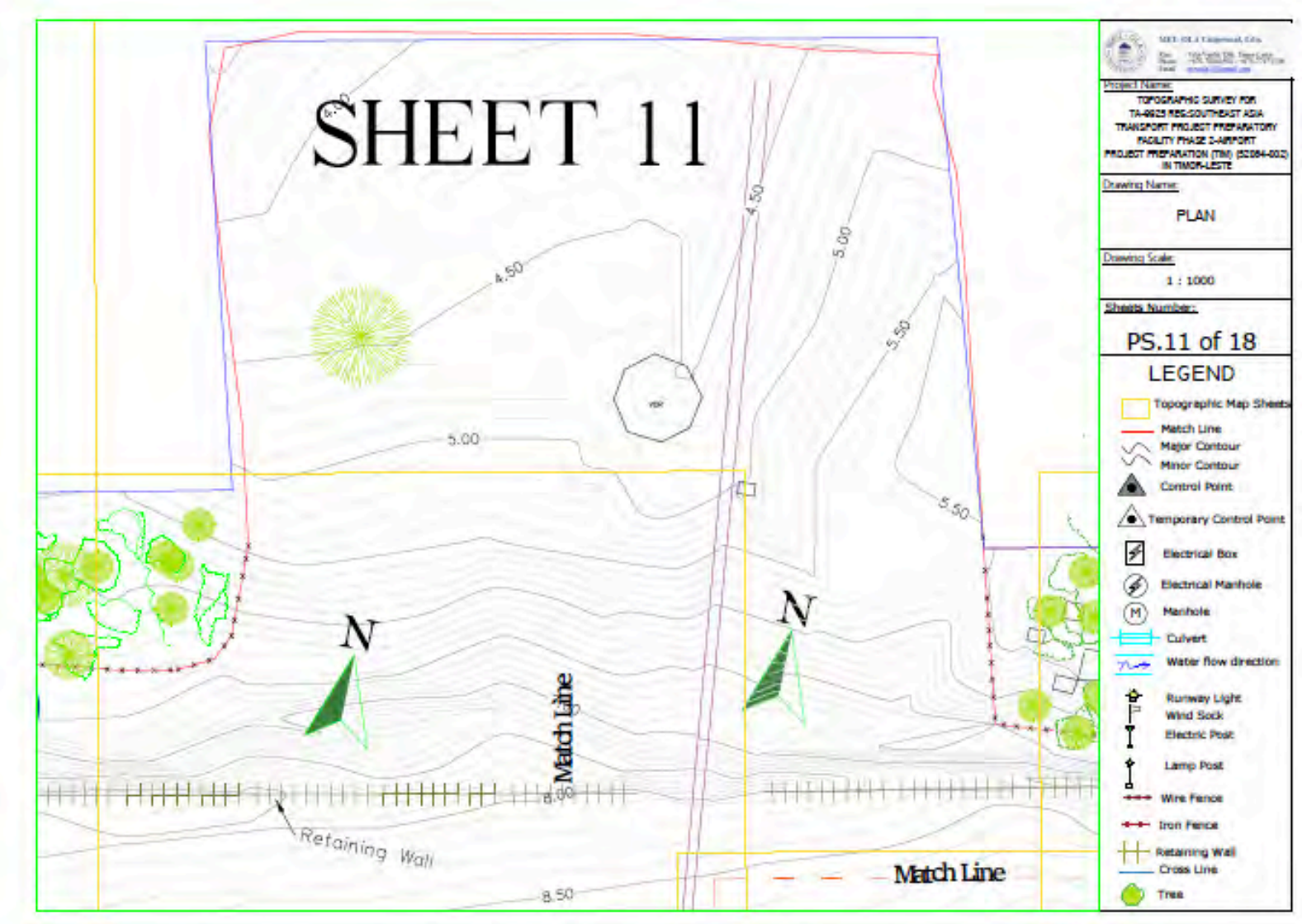
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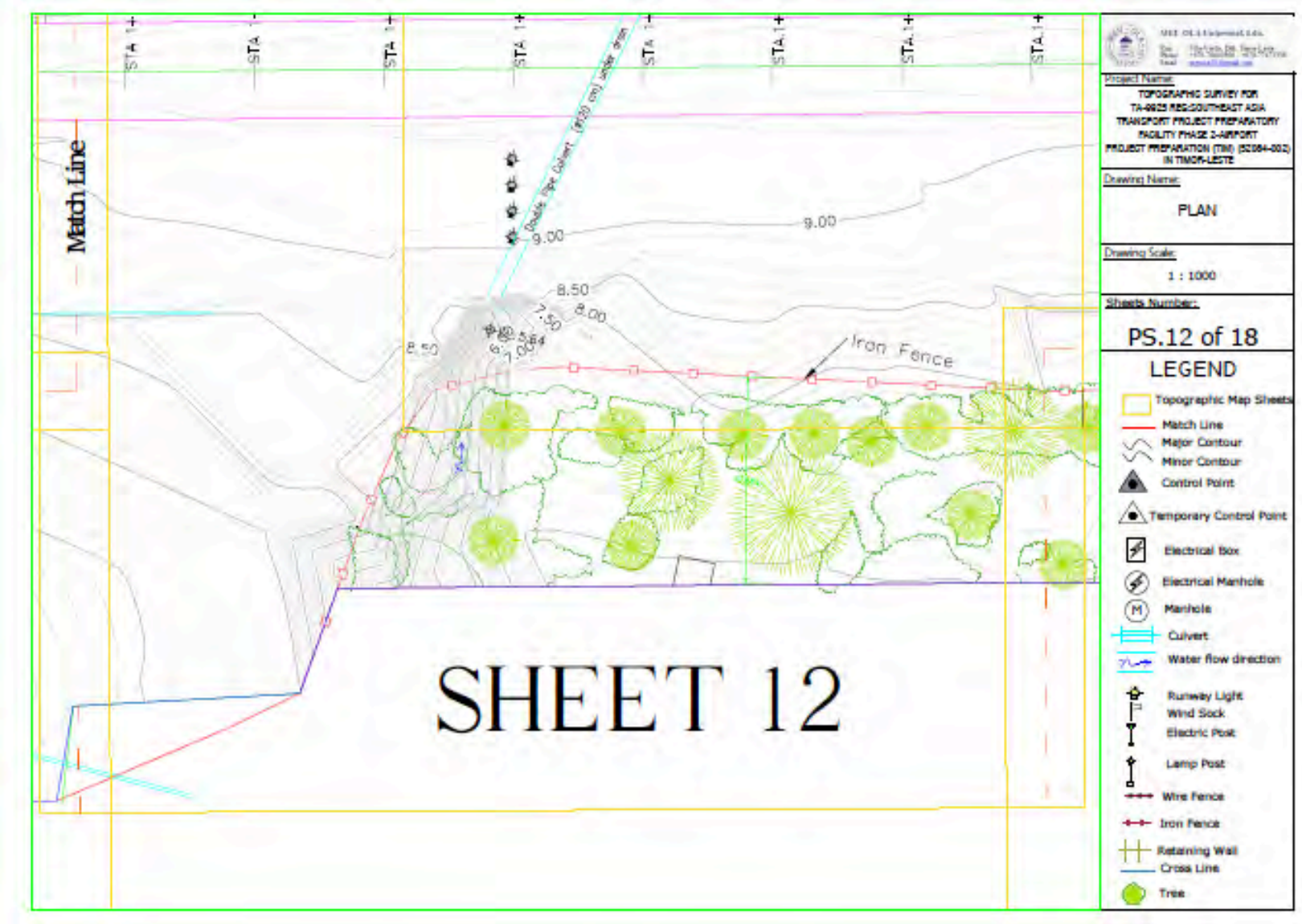
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8.00
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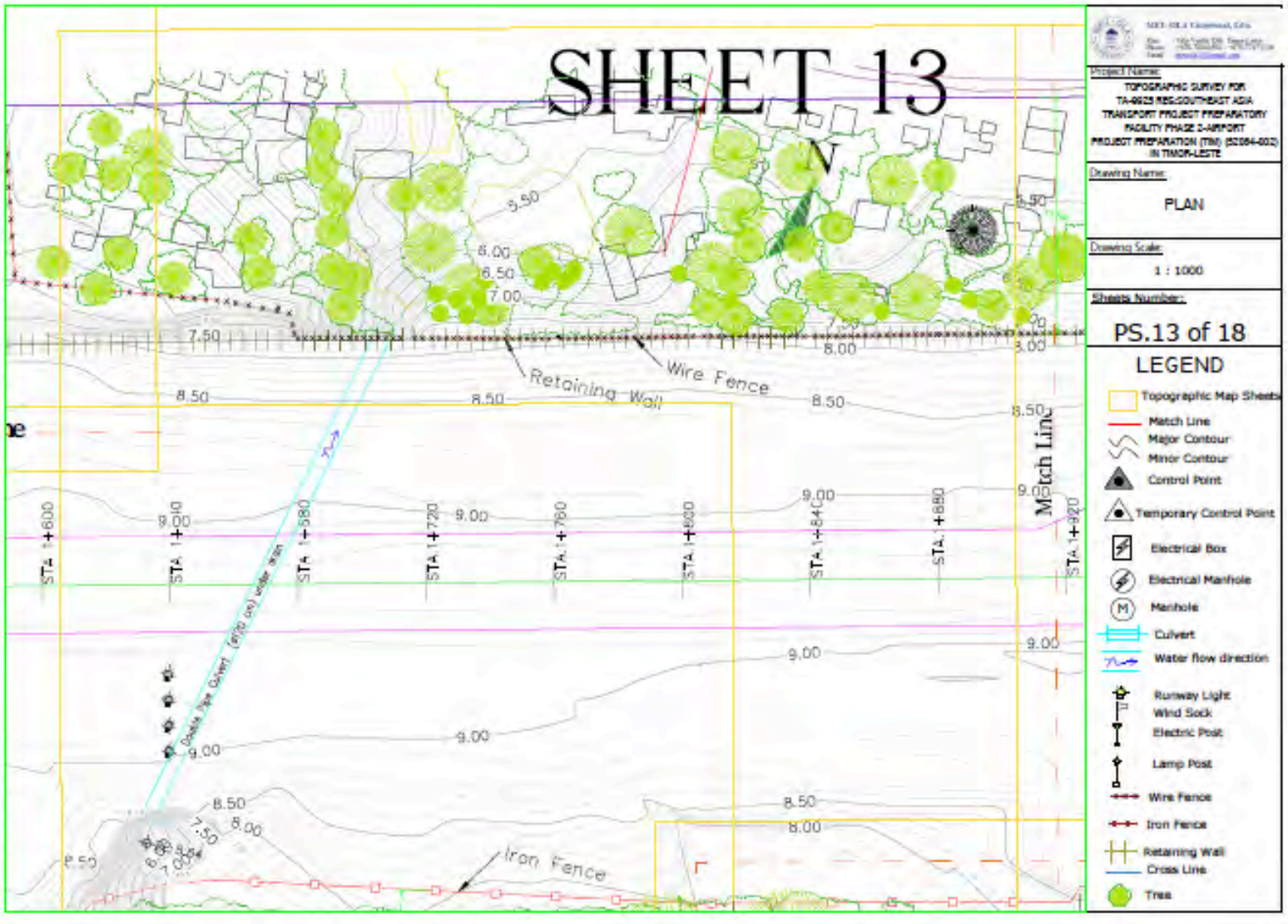
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Lamp Post
Wire Fence
Iron Fence
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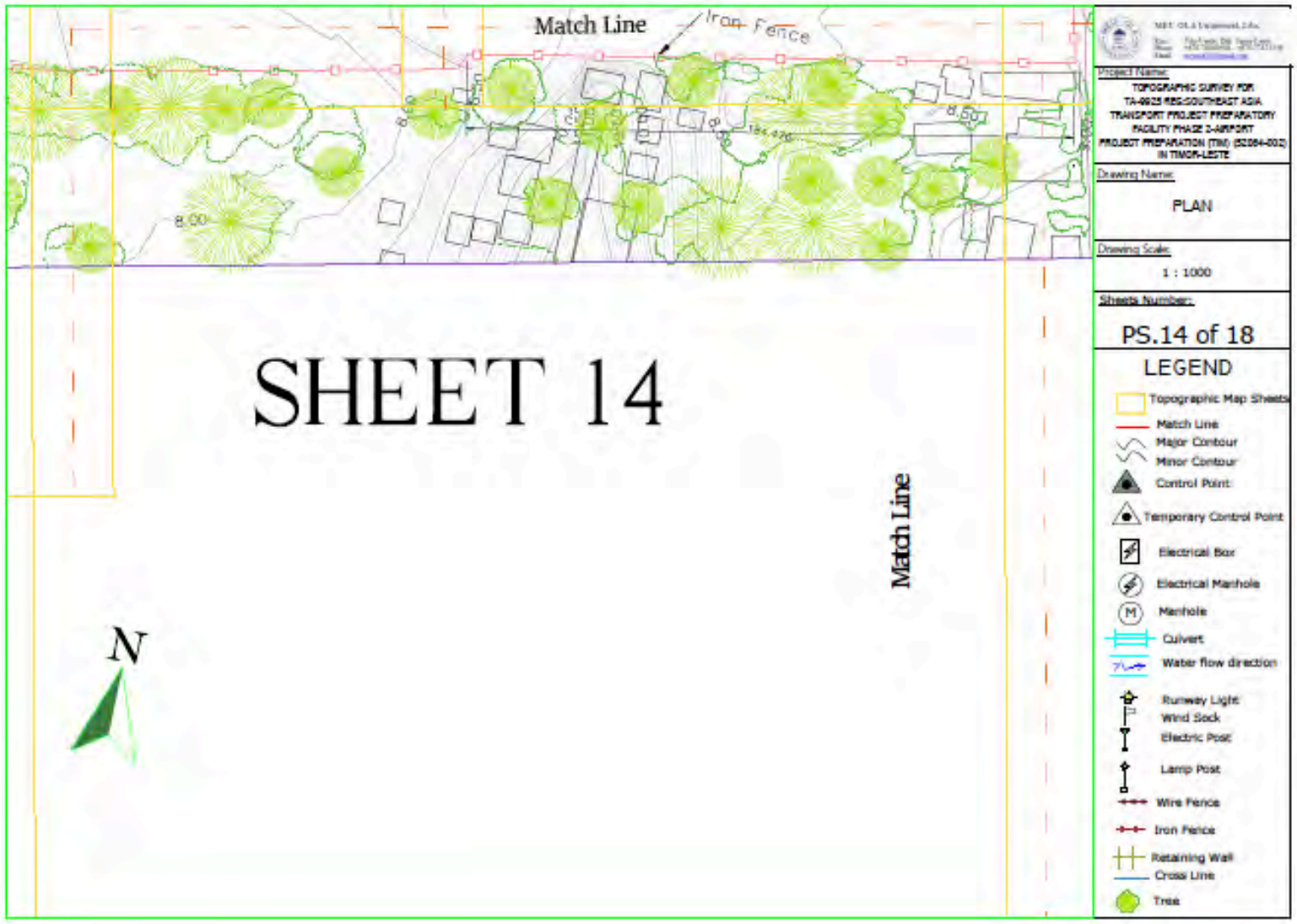
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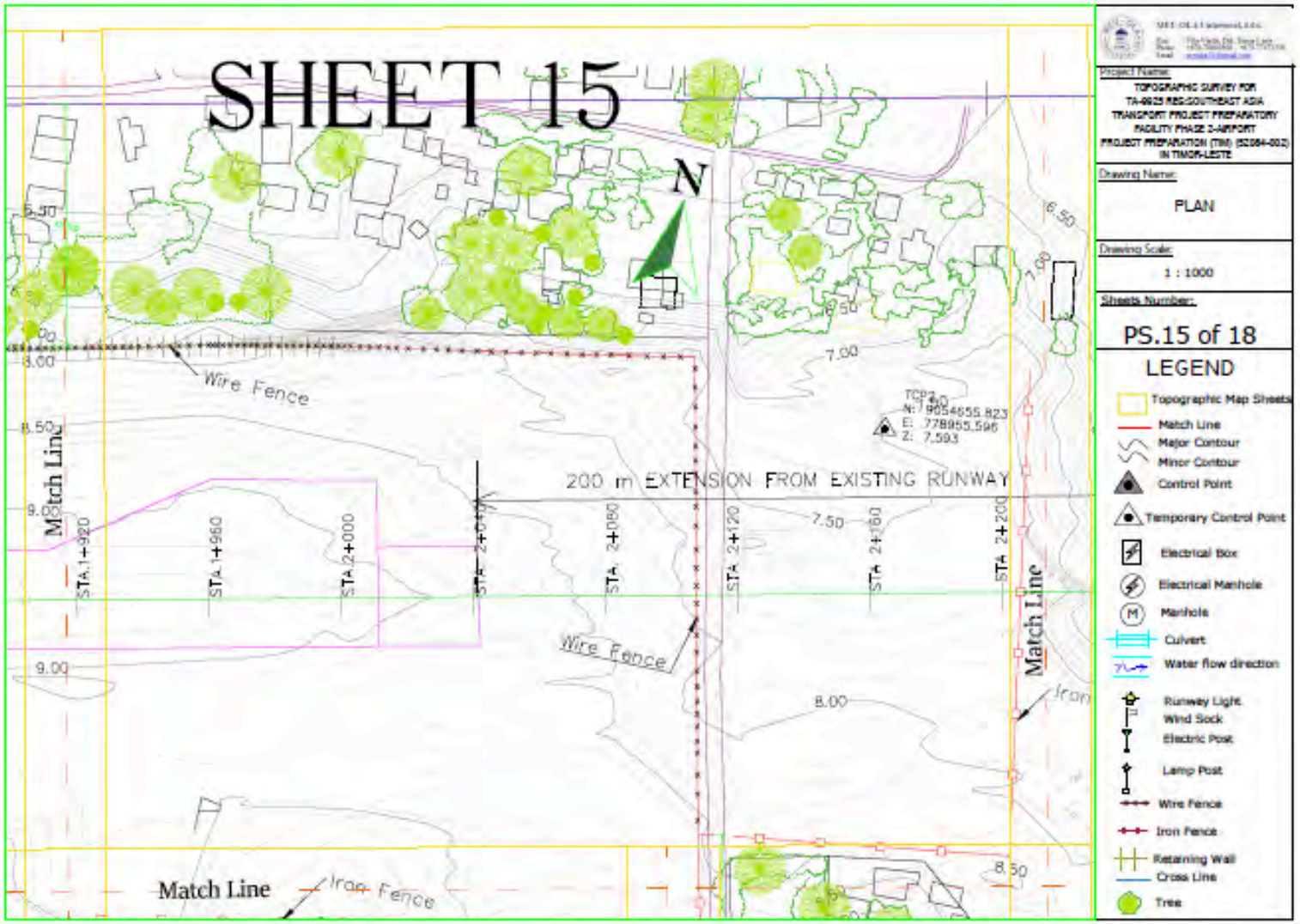
Iron Fence
Retaining Wall
Cross Line
Tree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Match Line
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STA 1+960
STA 2+000
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STA 2+080
STA 2+120
STA 2+160
STA 2+200
Wire Fence
Match Line
Iron
Match Line
Iron Fence
TCP7
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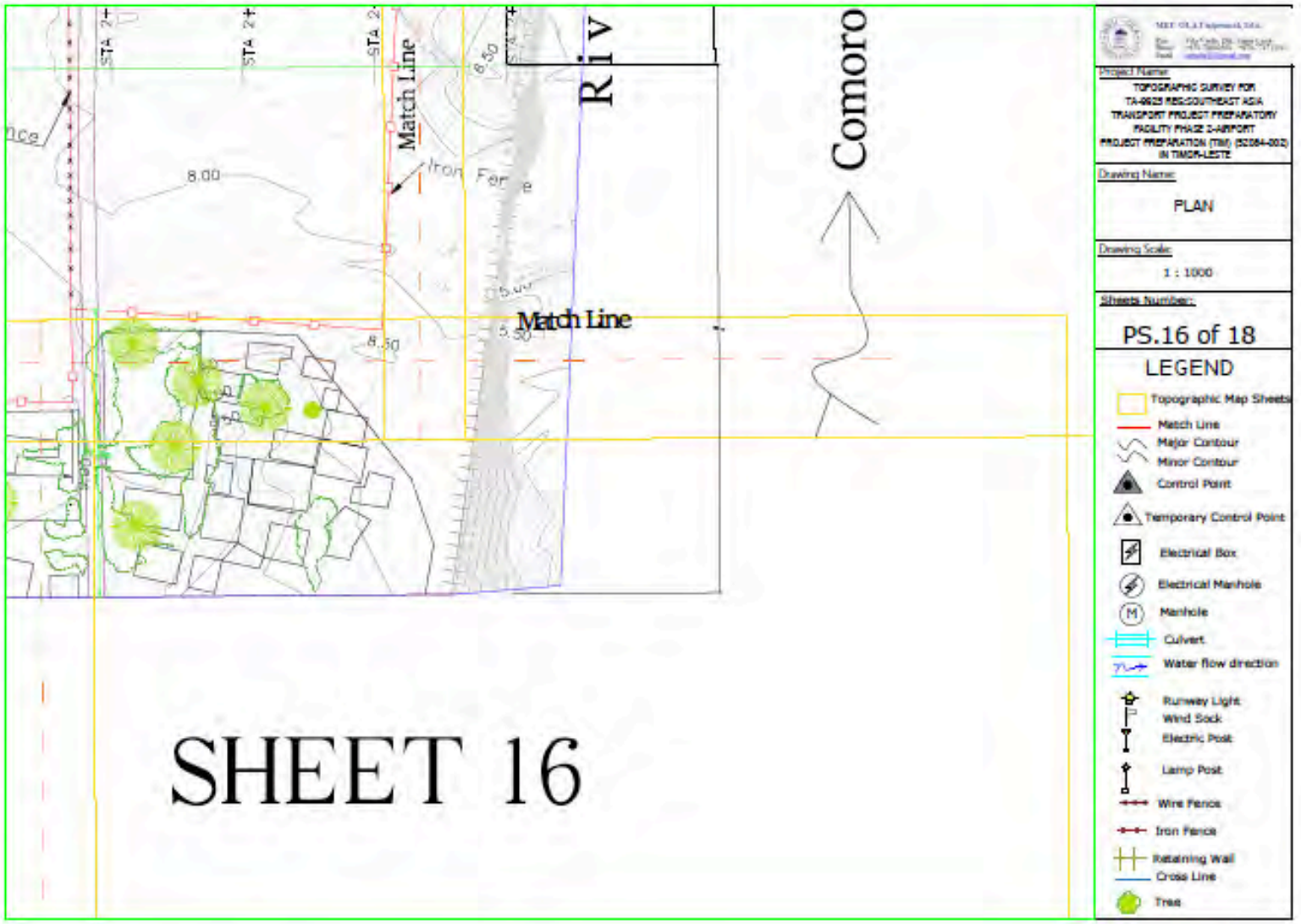
Project Name:
TOPOGRAPHIC SURVEY FOR TA-6825 REG:SOUTHEAST ASIA TRANSPORT PROJECT PREPARATORY FACILITY PHASE 2-AIRPORT PROJECT PREPARATION (TIM) (52084-002) IN TIMOR-LESTE
Drawing Name:
PLAN
Drawing Scale:
1 : 1000
Sheets Number:
PS.15 of 18
LEGEND
Topographic Map Sheets
Match Line
Major Contour
Minor Contour
Control Point
Temporary Control Point
Electrical Box
Electrical Manhole
Manhole
Culvert
Water flow direction
Runway Light
Wind Sock
Electric Post
Lamp Post
Wire Fence
Iron Fence
Retaining Wall
Cross Line
Tree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Comoro
8.00
8.50
5.50
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TOPOGRAPHIC SURVEY FOR
TA-9625 REG:SOUTHEAST ASIA
TRANSPORT PROJECT PREPARATORY
FACILITY PHASE 2-AIRPORT
PROJECT PREPARATION (TBA) (52084-002)
IN TIMOR-LESTE
Drawing Name:
PLAN
Drawing Scale:
1 : 1000
Sheets Number:
PS.16 of 18
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Minor Contour
Control Point
Temporary Control Point
Electrical Box
Electrical Manhole
Manhole
Culvert
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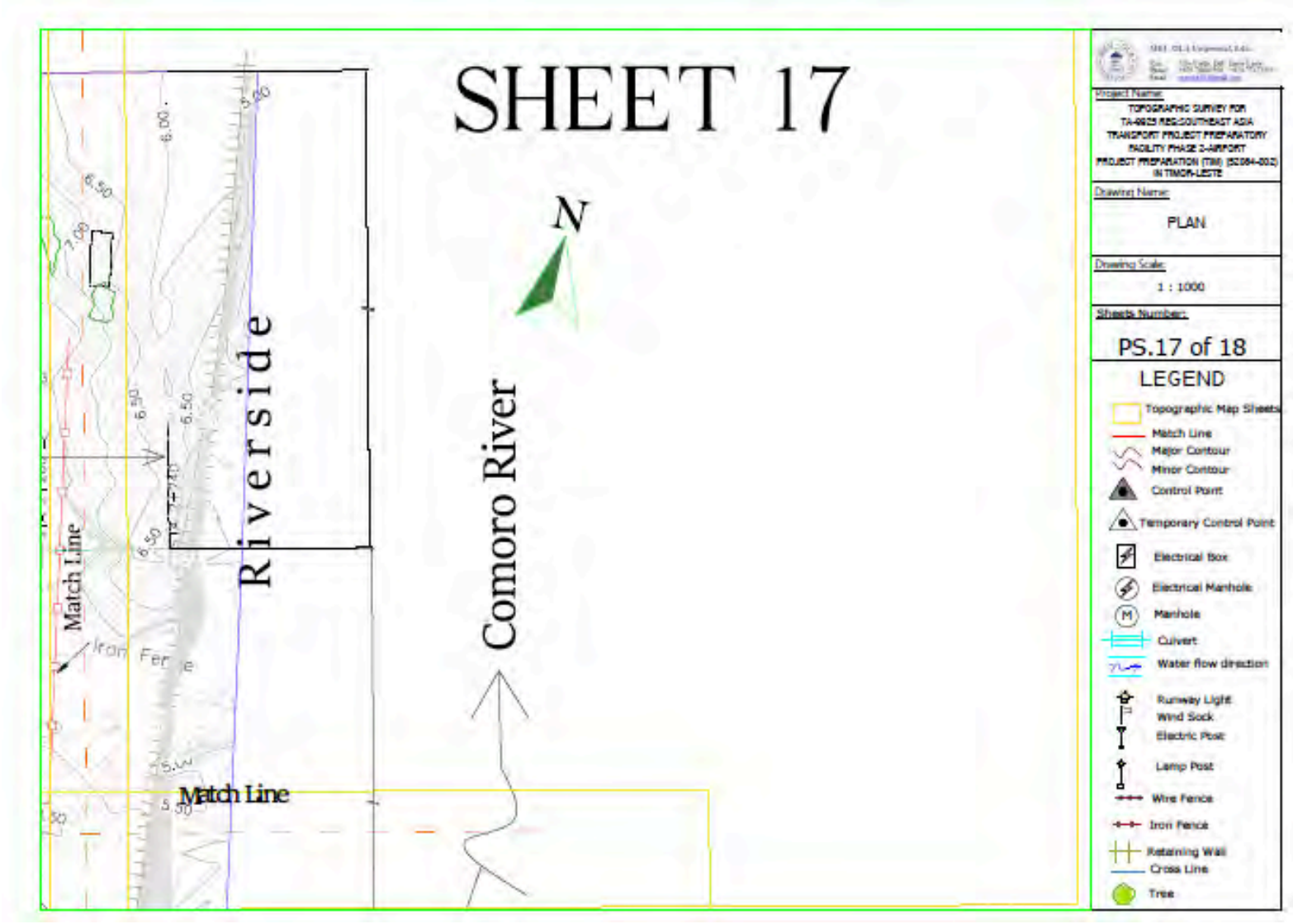
Runway Light
Wind Sock
Electric Post
Lamp Post
Wire Fence
Iron Fence
Retaining Wall
Cross Line
Tree
SHEET 16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Comoro River
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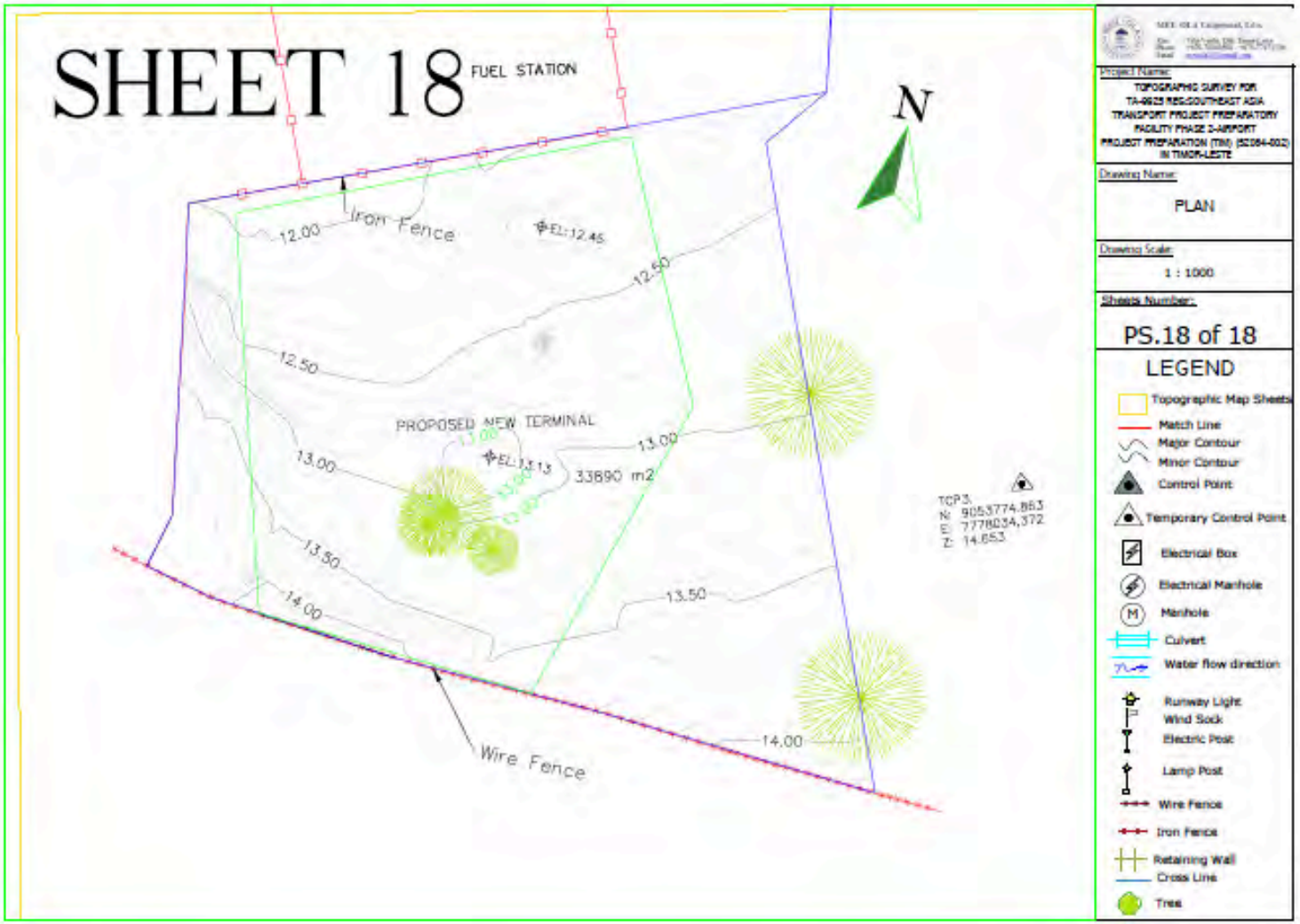
Project Name:
TOPOGRAPHIC SURVEY FOR
TA-6925 REG:SOUTHEAST ASIA
TRANSPORT PROJECT PREPARATORY
FACILITY PHASE 2-AIRPORT
PROJECT PREPARATION (TBM) (52084-002)
IN TIMOR-LESTE
Drawing Name:
PLAN
Drawing Scale:
1 : 1000
Sheets Number:
PS.17 of 18
LEGEND
Topographic Map Sheets
Match Line
Major Contour
Minor Contour
Control Point
Temporary Control Point
Electrical Box
Electrical Manhole
Manhole
Culvert
Water flow direction
Runway Light
Wind Sock
Electric Post
Lamp Post
Wire Fence
Iron Fence
Retaining Wall
Cross Line
Tree


SHEET 18
FUEL STATION
N
Iron Fence
Wire Fence
PROPOSED NEW TERMINAL
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13.50
14.00
TCP3
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FACILITY PHASE 2-AIRPORT
PROJECT PREPARATION (TBN) (52084-002)
IN TIMOR-LESTE
Drawing Name:
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Drawing Scale:
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PS.18 of 18
LEGEND
Topographic Map Sheets
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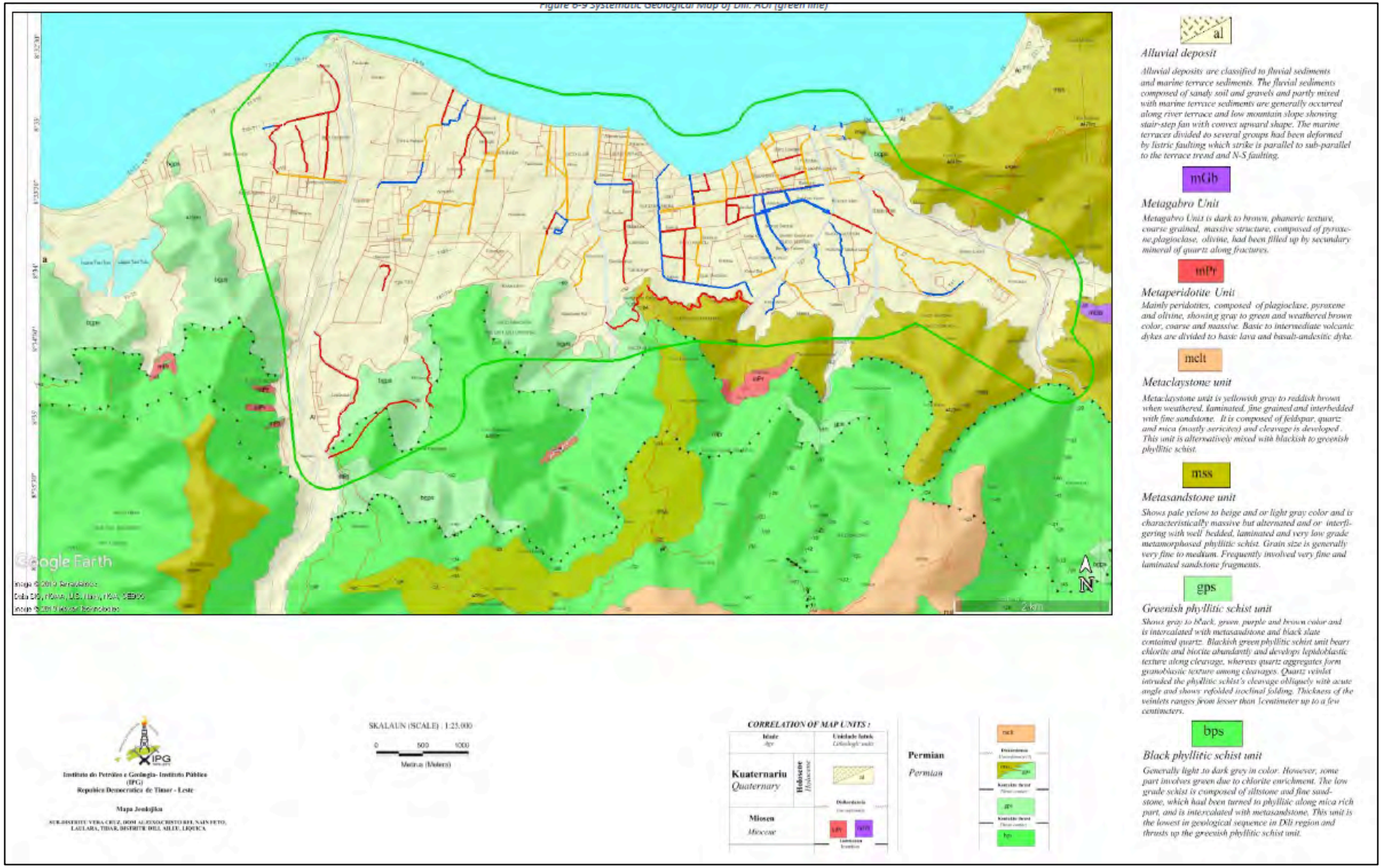
Minor Contour
Control Point
Temporary Control Point
Electrical Box
Electrical Manhole
Manhole
Culvert
Water flow direction
Runway Light
Wind Sock
Electric Post
Lamp Post
Wire Fence
Iron Fence
Retaining Wall
Cross Line
Tree

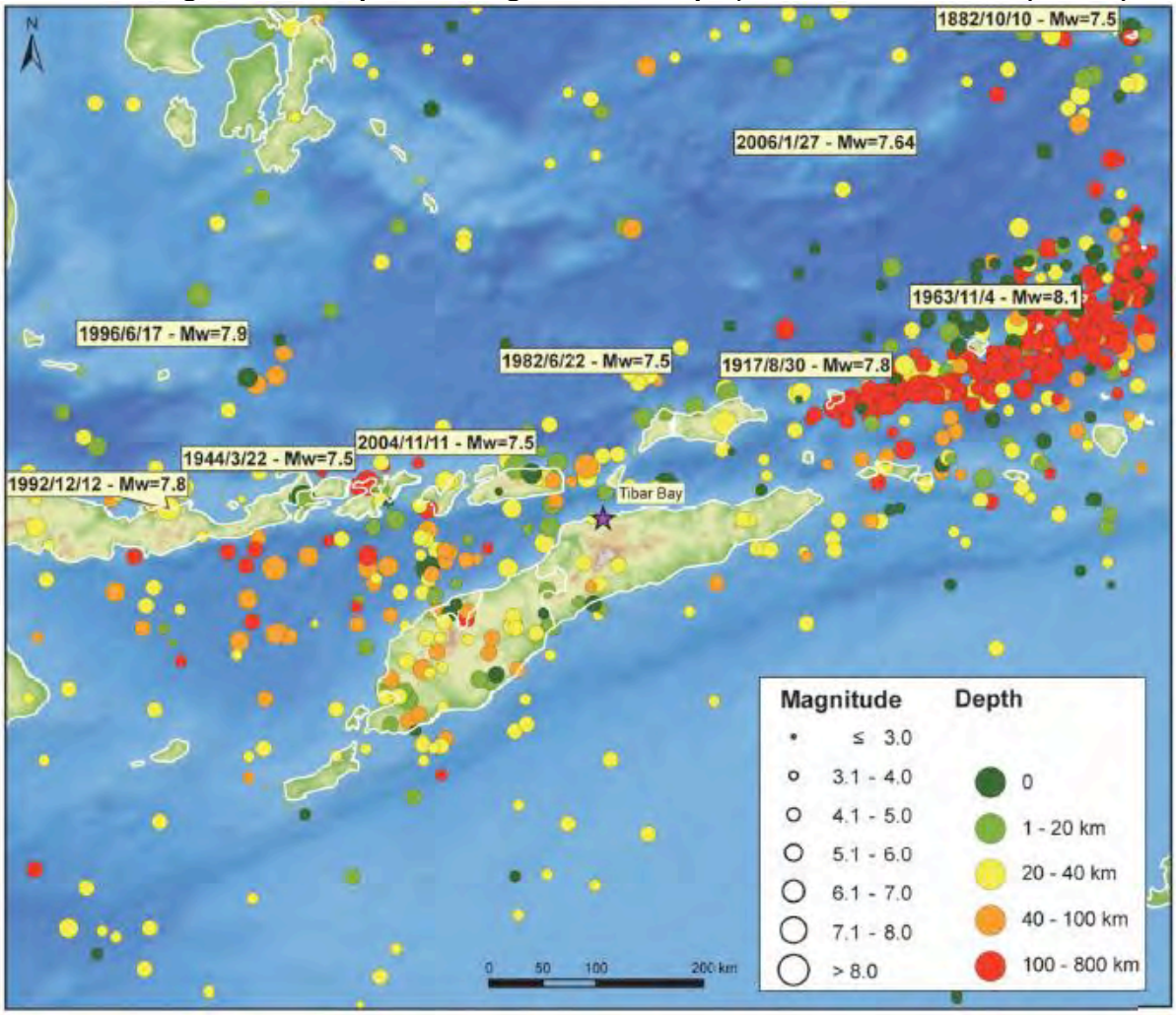
Geological Map of Dili

Figure 8-9 Systematic Geological Map of Dili. AOI (green line)



Timor Island Historical Earthquake Record

Final homogenized earthquake catalogue Tibar Port project from 1629 to 2016 (n = 835)



Source: Fugro, 2016. Magnitudes are expressed in moment magnitude (Mw)

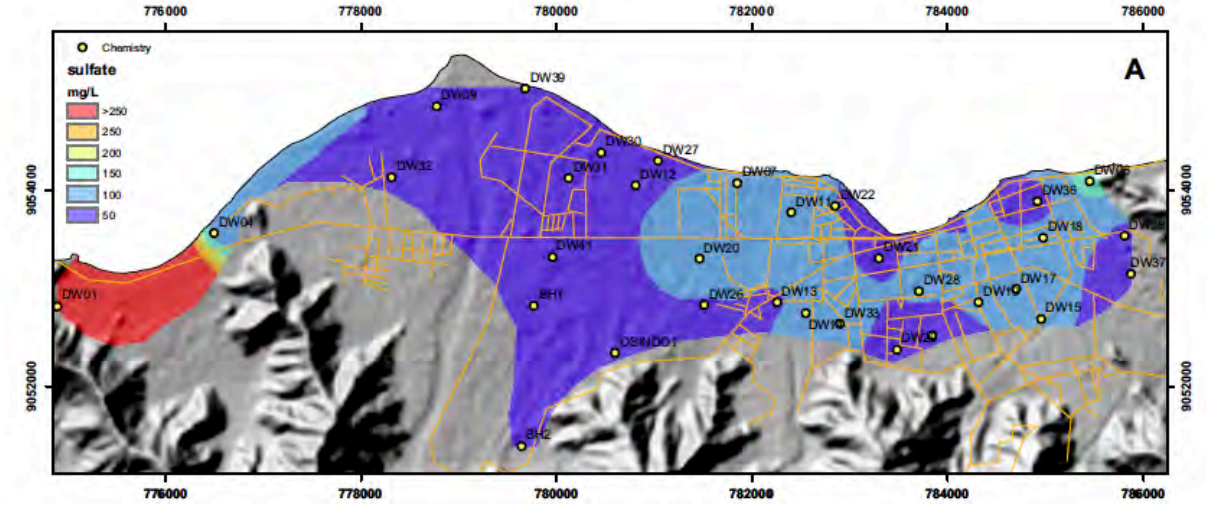
Timor-Leste Tsunami Risk Map

Tsunami mapping zone with return period of 100 years

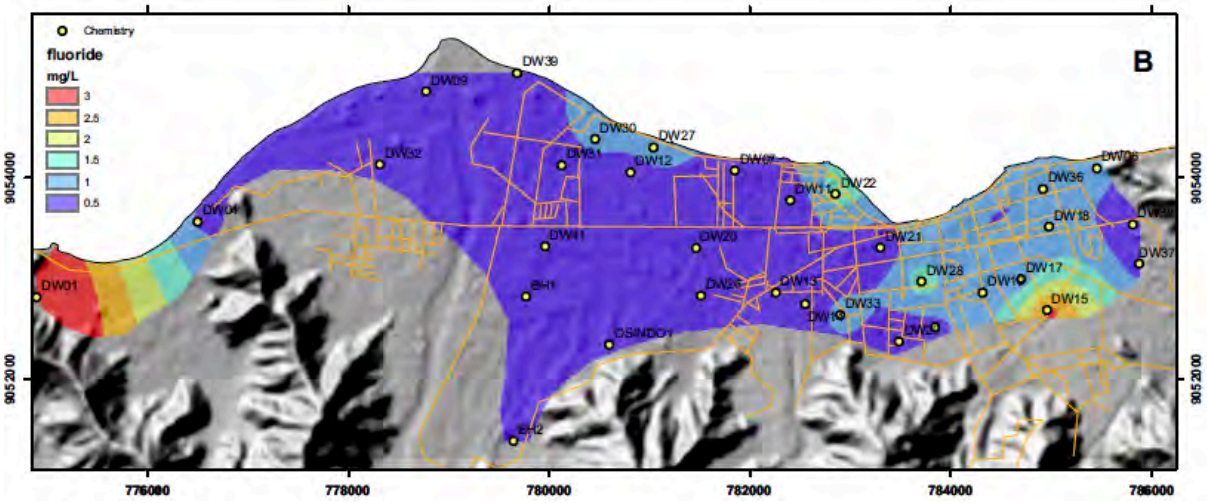
Source: UNDP 2010

Dili Groundwater Quality Maps

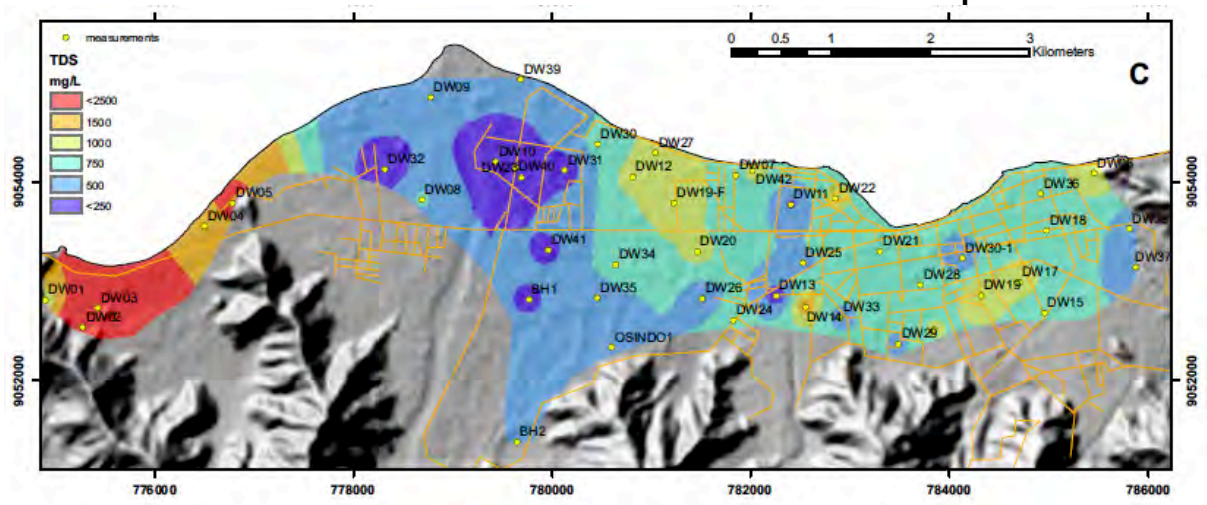
Sulfate concentrations in the unconfined aquifer.



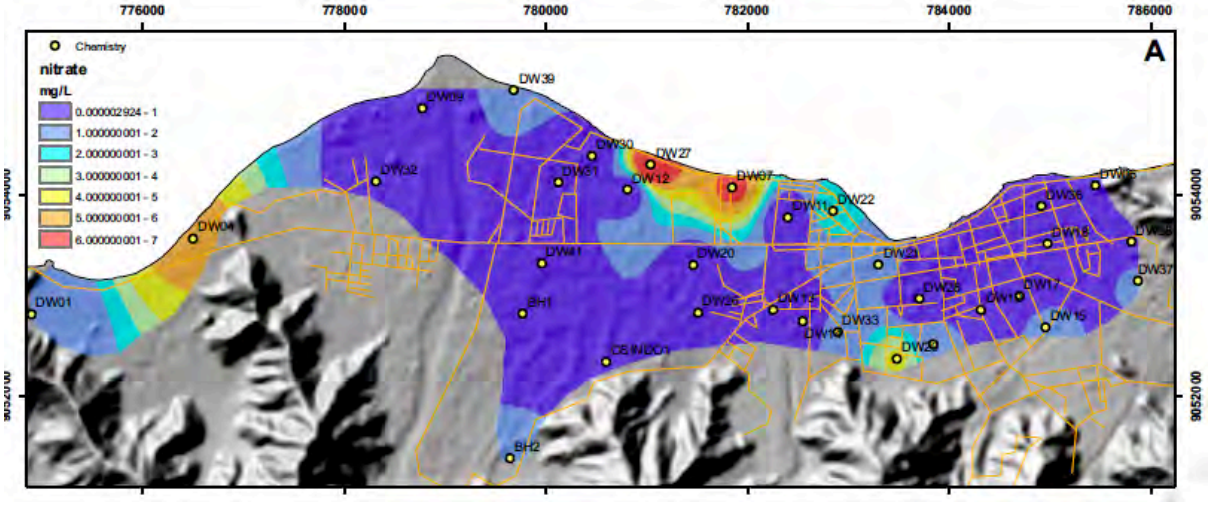
Fluoride concentrations in the unconfined aquifer.



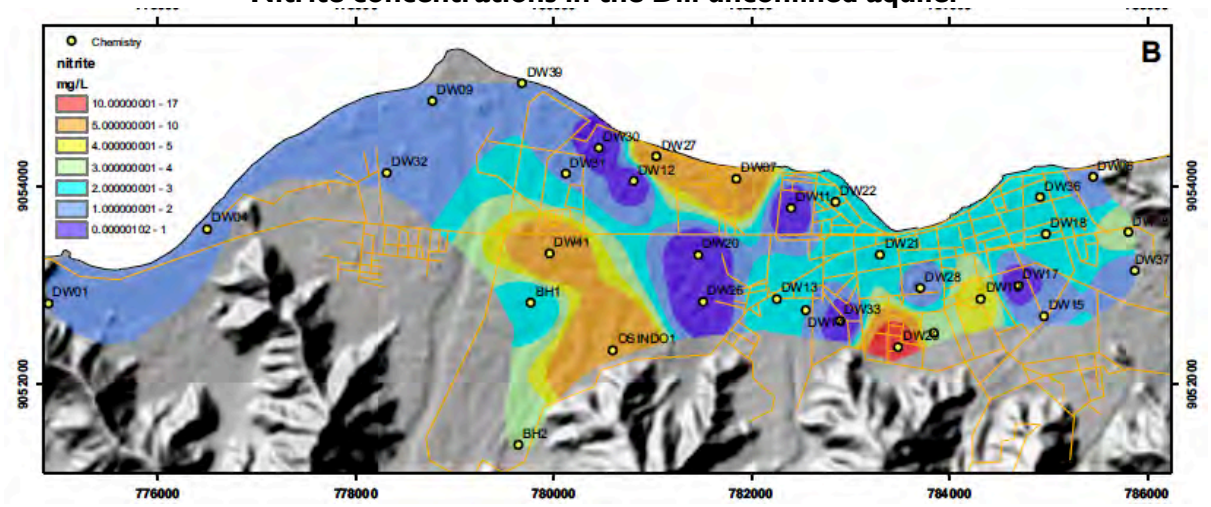
Total dissolved solids concentrations in the unconfined aquifer.



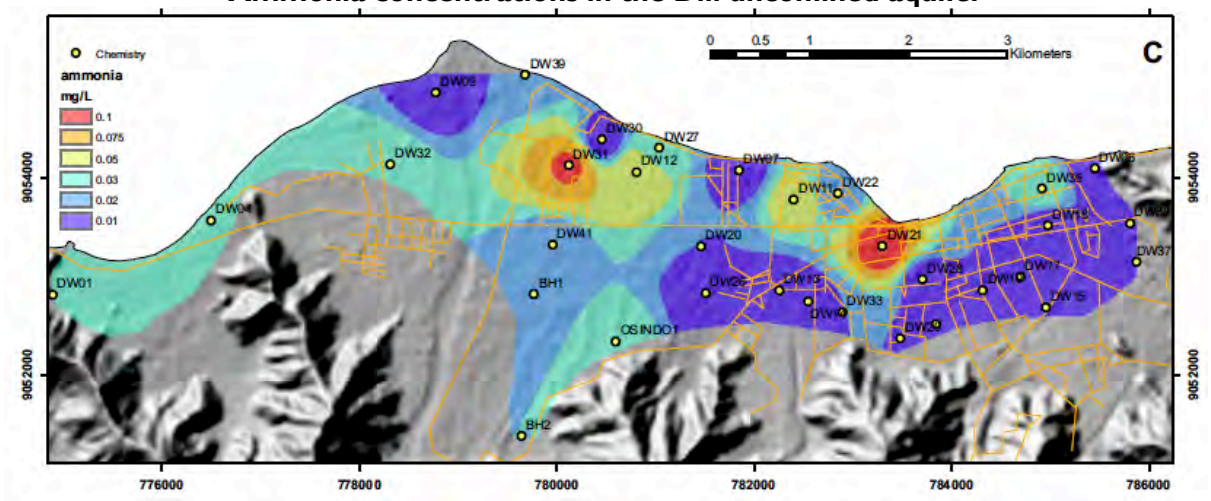
Nitrate concentrations in the Dili unconfined aquifer



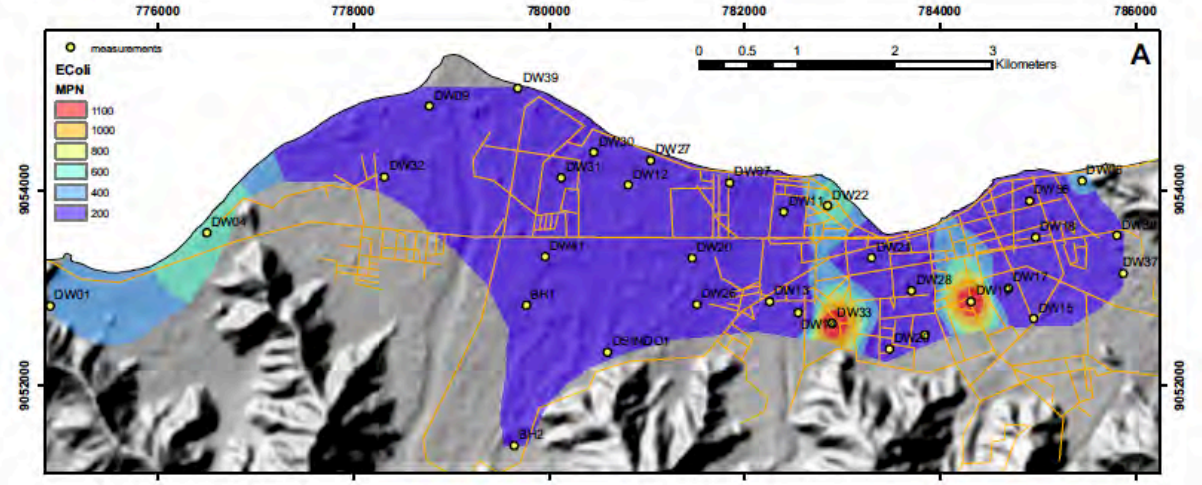
Nitrite concentrations in the Dili unconfined aquifer



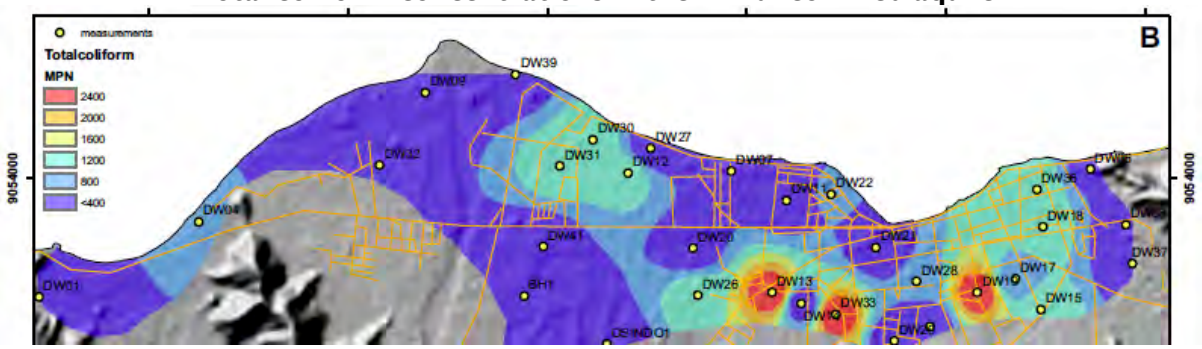
Ammonia concentrations in the Dili unconfined aquifer



E. coli concentrations in the Dili unconfined aquifer

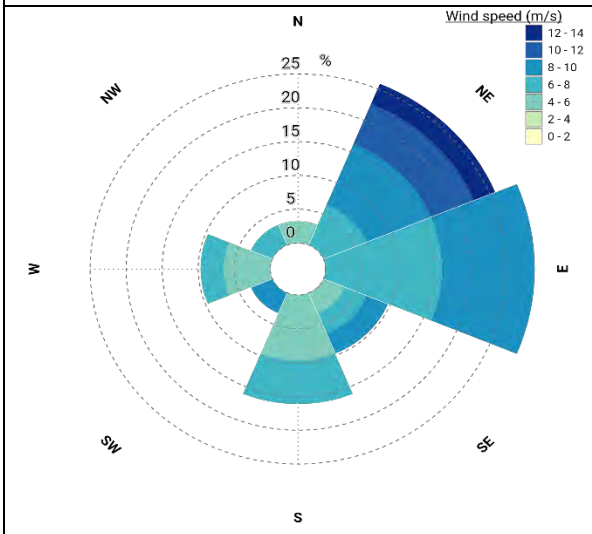
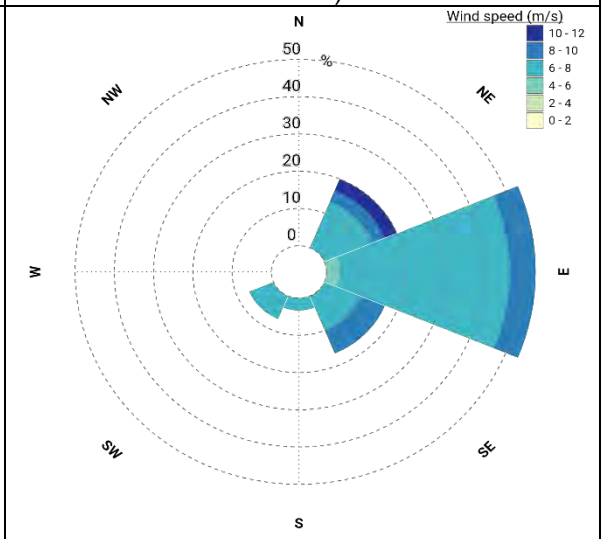
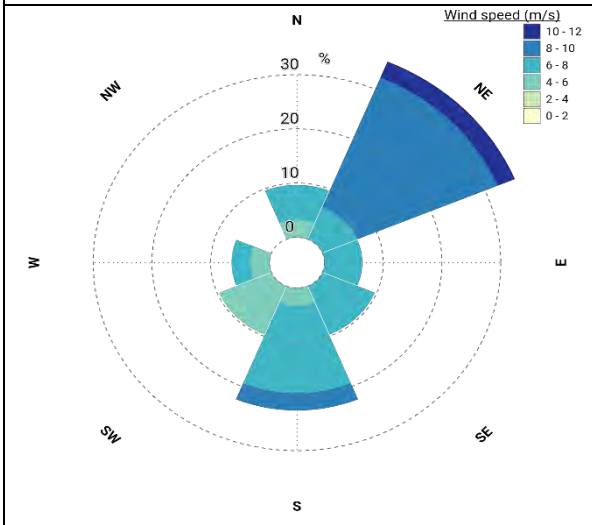
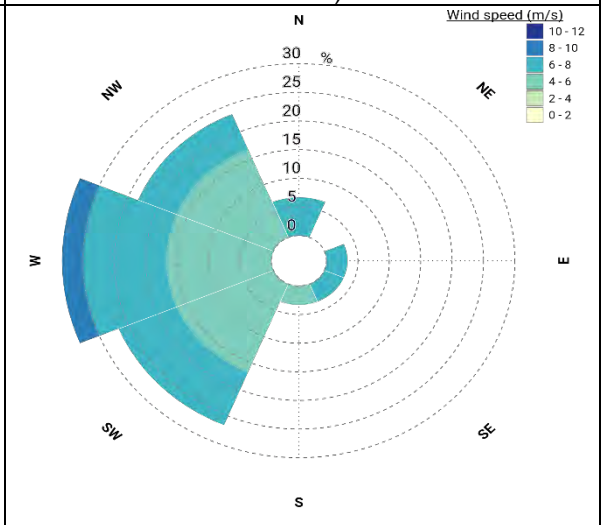


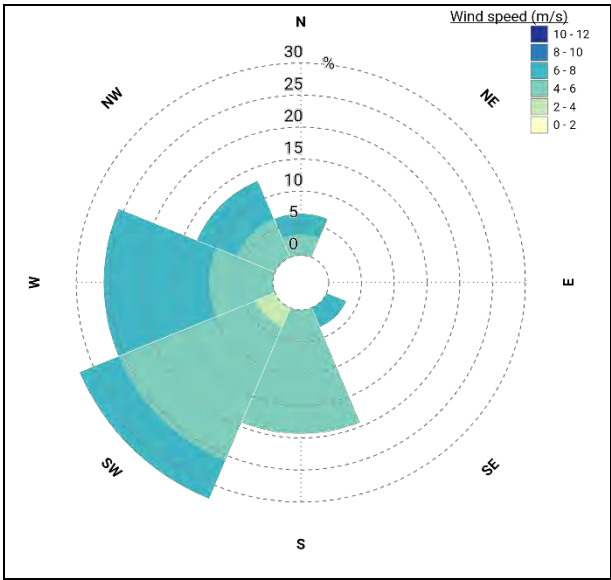
Total coliform concentrations in the Dili unconfined aquifer



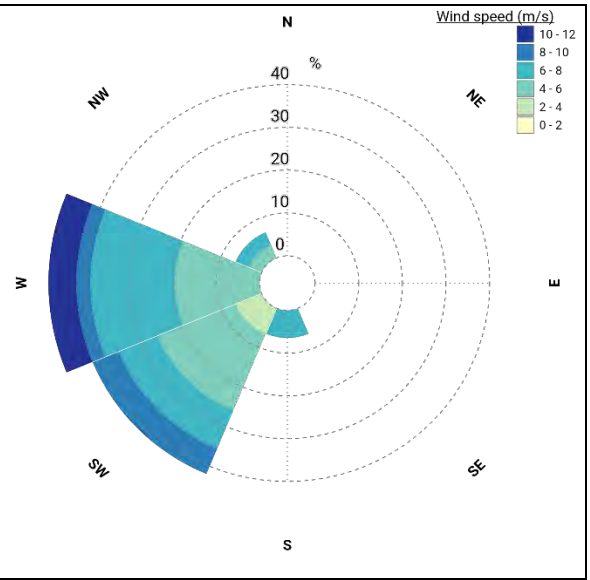
PNLIA Monthly Wind Roses

The following figures illustrate the wind direction and speed for a twelve month period (August 2019 – July 2020).

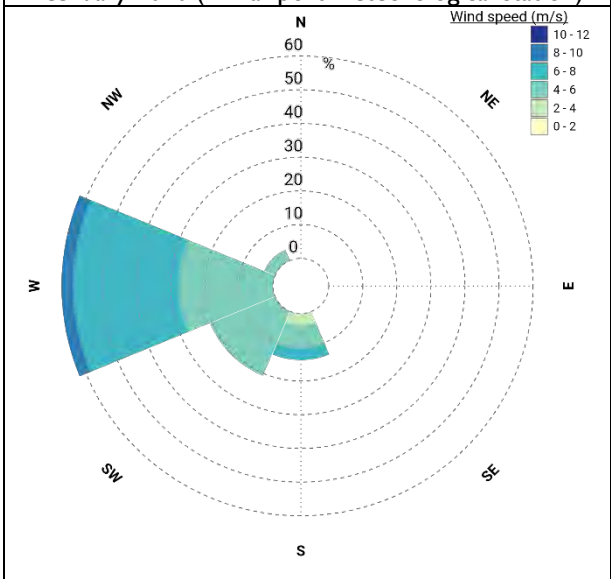
August 2019 (Dili airport meteorological station)	September 2019 (Dili airport meteorological station)
	
October 2019 (Dili airport meteorological station)	November 2019 (Dili airport meteorological station)
	
December 2019 (Dili airport meteorological station)	January 2020 (Dili airport meteorological station)



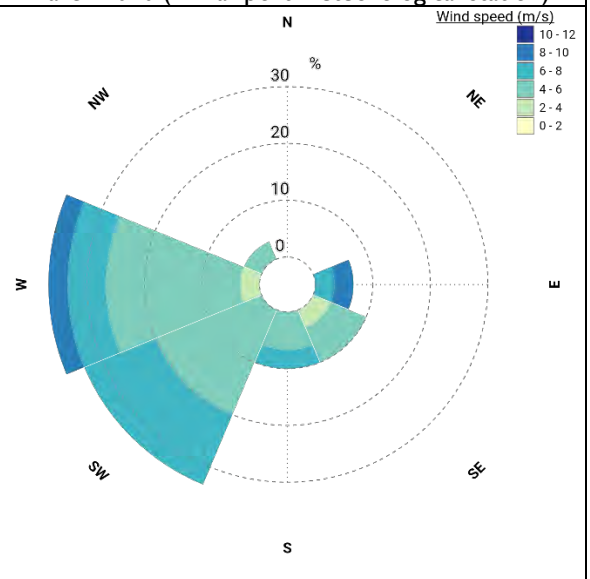
February 2020 (Dili airport meteorological station)



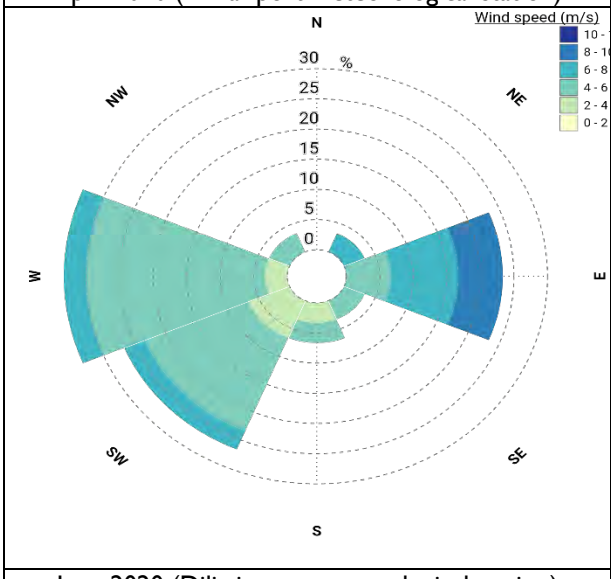
March 2020 (Dili airport meteorological station)



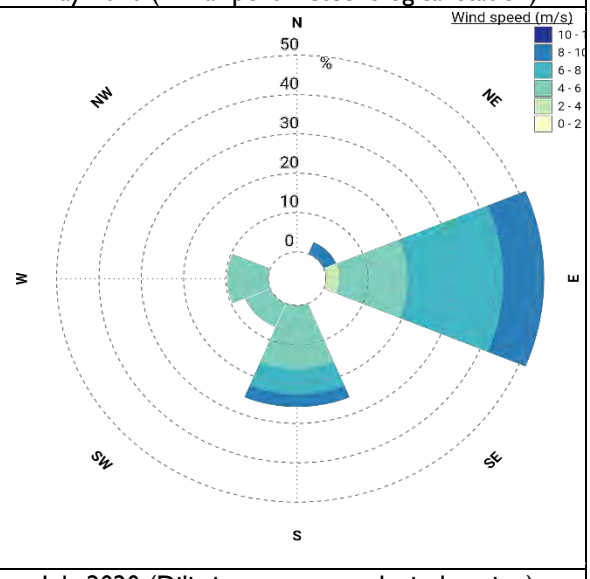
April 2020 (Dili airport meteorological station)



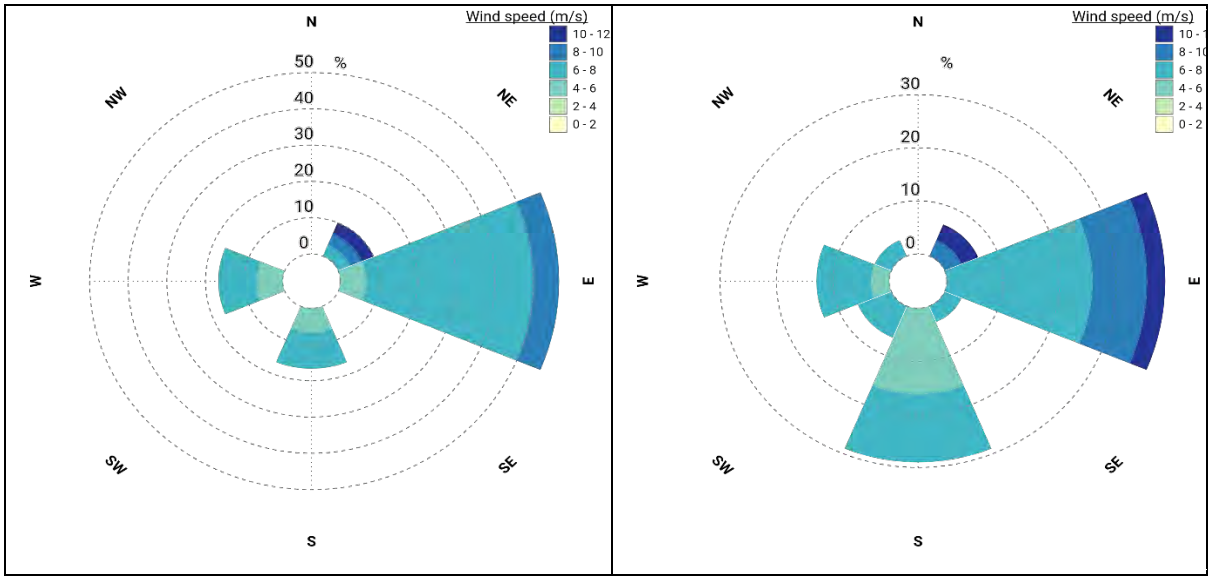
May 2020 (Dili airport meteorological station)



June 2020 (Dili airport meteorological station)



July 2020 (Dili airport meteorological station)


Wind speed (m/s)
10 - 12
8 - 10
6 - 8
4 - 6
2 - 4
0 - 2
N
NE
E
SE
S
SW
W
NW
50 %
40
30
20
10
0
Wind speed (m/s)
N
NE
E
SE
S
SW
W
NW
%
30
20
10
0

Appendix E – Sampling Methodologies

1.1. Air Quality

1.1.1. Sampling Methodology

The methodology section describes the methods used for measuring ambient air quality background concentration and meteorological data. Data collected shall be processed and analysed to yield the air quality baseline surrounding the project area.

Collection of Meteorological Data

Primary meteorological data were recorded during measurement of air quality background concentration. These include the temperature, relative humidity, wind speed and wind direction.

Secondary data of daily meteorological data, recorded at Dili airport meteorological station, particularly wind speed and direction, were collected from the NDMG. The data were then processed and presented as graphs and wind rose charts. The collected data were in the form of daily average data from January 2020 to December 2020.

Measurement of Air Quality Background Concentration

Six (6) criteria air pollutants which were monitored are as follows:

1) Particulate Matter (PM) with equivalent aerodynamic diameter of 10 micrometers or less (≤ 10 µm) and PM with equivalent diameter of 2.5 micrometers or less (≤ 2.5 µm) (PM_{10} & $PM_{2.5}$),
2) nitric oxide (NO),
3) nitrogen dioxide (NO_2),
4) sulphur dioxide (SO_2),
5) carbon monoxide (CO), and
6) ozone (O_3).

Each of these is listed in Table 1.1 and hereafter described.

Timor-Leste has no environmental standards on air quality. Thus, *WHO Air Quality Guidelines* (2005 AQGs Global update and 2000 AQGs for Europe) and the *Malaysian Ambient Air Quality Standards* (MAAQS) are used as guidance to assess the quality of air and its health consequences.

The guideline value for gas pollutant Nitric Oxide (NO), the predominant form of NOx from anthropogenic sources, cannot be sourced anywhere, likely due to it being unstable in air and spontaneously oxidised to NO_2, creating difficulties in designing and performing experimental effects and studies (ACEGL, 2012). Hence, the guideline values of the much more harmful NO_2 are considered applicable to all nitrogen oxides, including nitric oxide (ACEGL, 2012). The guideline values for PM and gas pollutants are listed in Table 1.2 below.

Table 1.1 Sampling method for air quality parameters.

	Parameter	Sampling Method	Sampling Duration	Equipment
1.	PM_{10} & $PM_{2.5}$	Light Scattering	24 hours	Optical particle counter HT – 9600
2.	Nitric Oxide	Amperometric Method	1 hour	Electrochemical gas sensor Bosean BH-90A
3.	Nitrogen Dioxide	Amperometric Method	1 hour	Electrochemical gas sensor Bosean BH-90A

4.	Sulphur Dioxide	Amperometric Method	24 hours	Electrochemical gas sensor Bosean BH-90A
5.	Carbon Monoxide	Amperometric Method	1 hour	Electrochemical gas sensor Benetech GM-8805
6.	Ozone	Amperometric Method	1 hour	Electrochemical gas sensor Bosean BH-90A

Table 1.2 WHO (2005) Air Quality Guidelines

	$PM_{2.5}$ ($\mu g/m^3$) 24-hour mean	**PM_{10} ($\mu g/m^3$) 24-hour mean**	**NO_2 ($\mu g/m^3$) 1-hour mean**	**$NO^{\#1}$ ($\mu g/m^3$) 1-hour mean**	**SO_2 ($\mu g/m^3$) 24-hour mean**	**$CO^{\#2}$ ($\mu g/m^3$) 1-hour mean**	**O_3 ($\mu g/m^3$) 1-hour mean**
WHO AQGs	25	50	200	-	20	30,000	-
MAAQS	35	100	280	-	80	30,000	180

#1 NO_2 guideline value is applicable to all nitrogen oxides, including nitric oxide, NO.
#2 Carbon Monoxide (CO) WHO guideline value uses the WHO AQGs 2000 for Europe.

- **PM_{10} and $PM_{2.5}$**

  Particulate matter was measured using an optical particle counter, which its detection method is based on the principle of light scattering from particles. As illustrated in Figure 1.1, the particles crossing the illumination zone, collimated from a laser diode, produce a photoelectric impulse, which is proportional to the size of particle to be measured (Agranovski, 2010).

  The data were collected once (a single reading) every 10 minutes for 24 hours.

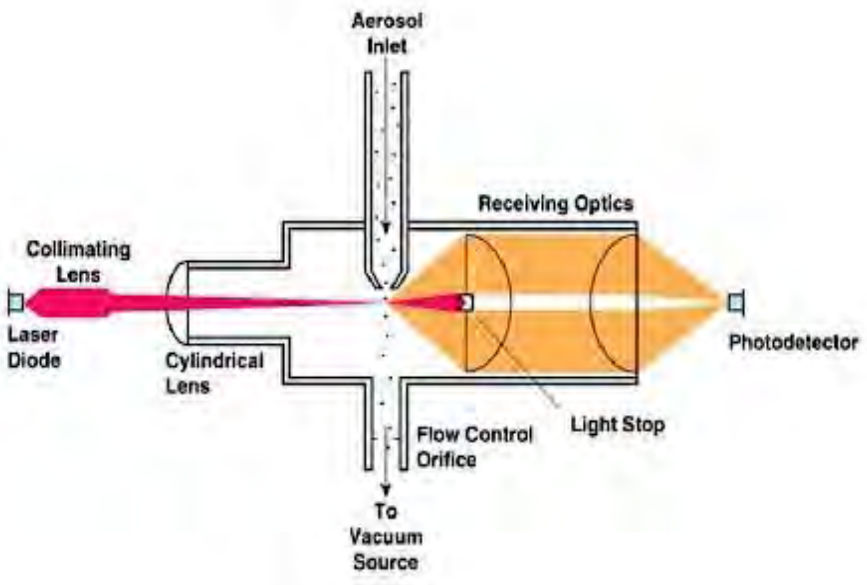


Figure 1.1 A schematic design of an optical particle counter.

- **Carbon Monoxide**

This parameter is not covered in WHO AQGs 2005. Instead, WHO AQGs 2000 for Europe is used.

The data were collected once (a single reading) every 10 minutes for 1 hour.

- **Sulphur dioxide**
  SO_2 was measured using an Amperometric sensor. The data were collected once (a single reading) every 10 minutes for 24 hours.

- **Nitrogen Dioxide**
  NO_2 was also measured using an Amperometric sensor. A reduction reaction may occur that disassociates it to form nitrogen and oxygen, resulting in the flow of electrons from the counter electrode to the sensing electrode and generates electrical current. The data were collected once (a single reading) every 10 minutes for 1 hour.

- **Nitric Oxide**
  Nitric oxide (NO) is a colourless and tasteless gas, which along with NO_2 forms a group of nitrogen oxides (NOx). Emissions of NOx from combustion processes occur predominantly in the form of nitric oxide (NO), which comprises around 95%. However, it undergoes spontaneous conversion to NO_2 via reaction with atmospheric ozone (O_3) (WHO, 2005). Thus, nitrogen dioxide guideline value is applicable to nitric oxide.

- **Ozone**

  O_3 was measured using an Amperometric sensor. The data were collected once every 10 minutes in 1 hour. WHO AQGs has 8-hour mean value. Therefore, the Malaysian Ambient Air Quality Standards, which covers 1-hour mean value, are used.

Equipment:

PARTICULATE MATTER (Model: HT-9600)
- Measuring range : 0-1000 µg/m³
- Resolution ratio : 1l/min
- Sampling Time : 50s
- Grain size channels : 0.3, 2.5, 10 µg
- Temperature range : 0-50⁰C
- Humidity range : 0-99 %RH
- Work temperature : -10-50⁰C
- Working humidity : 10-99%RH
- Dimension : 245 x 85 x 40 mm
- Using to know the dust spreading in the project location
- Data collected every 10 minutes during 24 hours
- Data that collected directly in the field or project location

GAS DETECTOR (Model BOSEAN BH-90A)
Accuracy : ≤ ± 5% F.S
Range:
- **O_3** : 0-20 ppm
- **NO** : 0-20 ppm
- **NO_2** : 0-20 ppm
- Response Time: T<30s
- Humidity: <95% RH non-condensing
- Charging time: 4h-6h
- Dimension: 100mm x 60mm x 30mm

- Operating temperature: - 40^{0}C - 70^{0}C (for combustible gas)
  - 20^{0}C - 50^{0}C (for toxic gas)

Using to know the gas O_3, NO and NO_2 in the project area
Collecting each 10 minutes during a hour
Data that collected directly in the field or project location or project area

GAS DETECTOR (Model BOSEAN BH-90A)
Accuracy : ≤ ± 5% F.S
Range:
- **SO_2** : 0-20 ppm
- Response Time: T<30s
- Humidity: <95% RH non-condensing
- Charging time: 4h-6h
- Dimension: 100mm x 60mm x 30mm
- Operating temperature: - 40^{0}C - 70^{0}C (for combustible gas)
  - 20^{0}C - 50^{0}C (for toxic gas)

Using to know the gas SO_2 in the project area
Collecting each 10 minutes during 24 hour
Data that collected directly in the field or project location or project area

GAS ANALIZER (Model: Gas Detector BH-4S)
- Accuracy : ≤ ± 5% FS
- Response Time : T <30s
- Working environment : 20 ^{0}C – 50 ^{0}C, <95% RH (no dew)
- Explosion-proof grade : Exib IIB T3 Gb
- Working time : ≥ 8h continuous (without alarming)
- Gas sensor life : 2 years
- Charging time : 6h-8h
- Dimension : 130*67*30mm
- Collecting each 10 minutes during a hour
- Data that collected directly in the field or project location or project area

Target Gas	Range	Low alarm	High alarm	Resolution
H2S	0-100 ppm	10 ppm	35 ppm	1 ppm
O2	0-30 %vol	19,5 %vol	23,5 %vol	0,1 %vol

CARBON MONOXIDE METER (Model: GM 8805)
- Detected gas : CO in air
- Measuring range : 0-1000 ppm
- Frequency ratio : 1 ppm
- Minimum reading : 1 ppm
- Basic error : ± 5% (F.S), ± 10 ppm
- Response time : 60 seconds
- Sensor type : Electrochemistry CO sensor
- Working environment : 0-50 ^{0}C, 32-122 ^{0}F ; 10-90 %RH
- Storage environment : -10-80 ^{0}C, -14-176 ^{0}F ; 10-75 %RH
- Power supply : 2x1, 5V AAA battery
- Dimension : 55.7 x 29.9 x 135.5 mm
- Collecting each 10 minutes during a hour
- Data that collected directly in the field or project location or project area

ANEMOMETER (Model: GM 8902)

- Wind velocity range : 0,0-4,5 m/s
- Accuracy : ± 3% ±0,1
- Wind flow range : 0-99900 m^3 /min
- Operation condition temperature : 0-50^{0}C
- Operation condition humidity : ≤ 80%RH
- Dimension : 77 x 36 x 164 mm
- Using to know the wind velocity and wind direction in the project location
- Data collected each 10 minutes during a hour
- Data that collected directly in the field or project location

1.1.2. Results

The results of air quality measurement in the three locations are considered as the background concentration of measured parameters, i.e. the concentration prior to the expansion project. Activities during construction phase may contribute to the increase of emission of air pollutants to the ambient air surrounding the project area.

a. Wind speed and wind direction

The wind speed and wind direction at the time of monitoring (28 – 29 December 2020) from NDMG indicated westerly wind with an average speed of 3.6 ms^{-1}.

b. Relative humidity and Temperature

Relative humidity at all monitoring points was between 60.4% - 76.7%, and ambient temperature between 30 ◦C – 32.6 ◦C.

	AQ1	AQ2	AQ3
Relative humidity (%)	60.4 - 64.4	70 – 70.6	74.3 – 76.7
Temperature (°C)	32.1 – 32.6	31 – 31.6	30 - 32

c. $PM_{2.5}$ and PM_{10}

The 24-hour mean measurement results in three locations are displayed in Figure 1.3 and Figure 1.4, whilst the hourly results are shown in Figure 1.5.

The mean results of $PM_{2.5}$ concentrations at all monitoring points were below 10 µg/m^3 and significantly lower as compared to the results from the Pelican Paradise project (Table 1.3). Also, all measured $PM_{2.5}$ concentrations were below both WHO and MAAQS maximum limits.

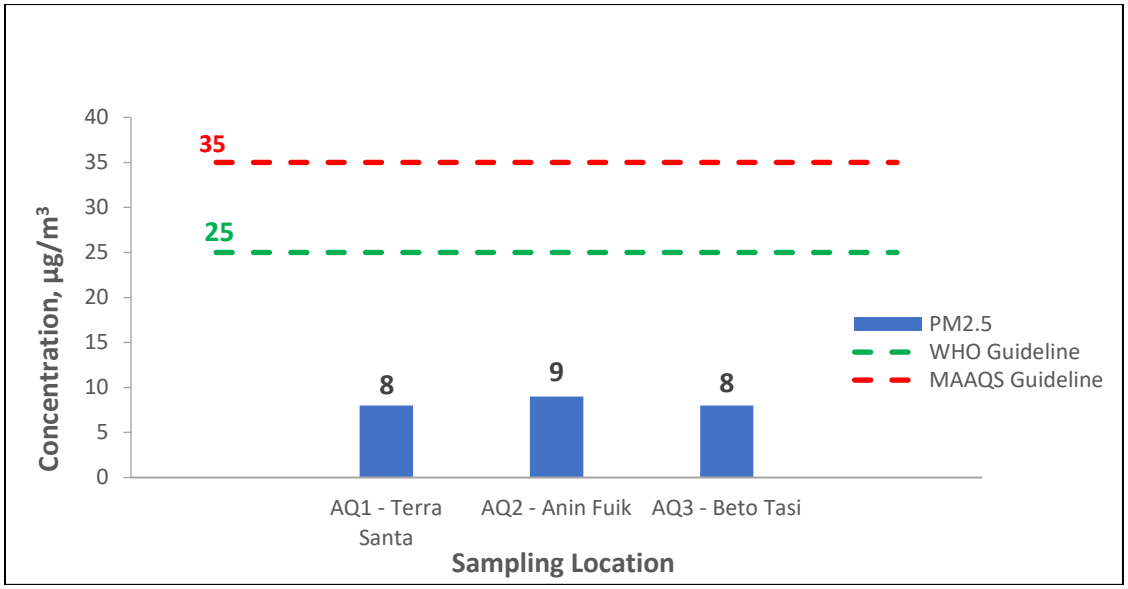


Figure 1.3 PM 2.5 in the 3 sampling locations compared against WHO Guideline and MAAQS Guideline.

The results of PM_{10} concentrations at two locations, AQ1 and AQ2, were comparable to those of Pelican Paradise project measurements, but location AQ3 gave a considerable high value of 109 µg/m³, which exceeded both the WHO and MAAQS guideline limits.

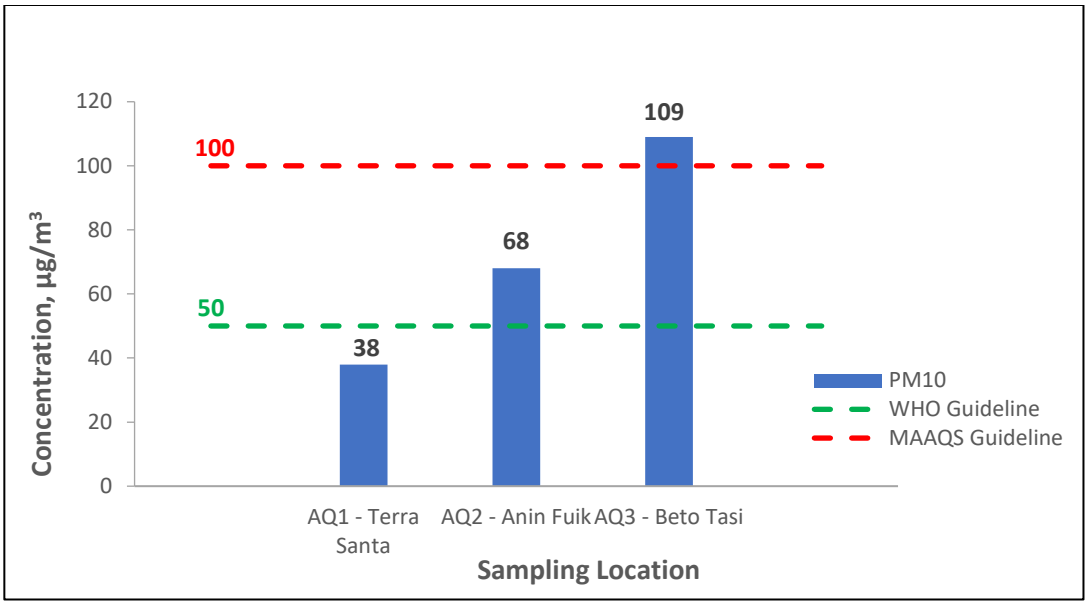


Figure 1.4 PM10 in the 3 sampling locations compared against WHO Guideline and MAAQS Guideline.

From Figure 1.5, it can be observed that there were three distinct peaks on both $PM_{2.5}$ and PM_{10}. The peak started at 11:30 - 13:30, rose up again from 19:00 until midnight and increased again on the early hours from 5:30 until 7:00. As the monitoring stations were within residential areas, these peaks were likely correspond to the hours of domestic cooking using solid fuels, which is a primary source of particulate matter.

Further, except for the three distinct peaks implied above originating from wood burning, the hourly values of PM concentrations at the three locations exhibited lower values during the day time and slightly increased during the night time. This indicates a negative correlation between solar radiation and PM concentrations; when sun heating is at maximum (day time), PM concentrations reduce, and vice versa. During sun heating, the surface gets warmer and the air in contact with the

surface is heated and induces convection process, which moves the heated air upwards and blends with the surface layer. The stronger the solar radiation is, the more intense the heat exchange will be, which in effect will increase the mixing and the size of whirlpools, thus helping to disperse pollutants (Afzali et al., 2014).

Additionally, PM_{10} concentrations displayed a rising trend from the west point to the east (AQ1,AQ2,AQ3). The wind direction and wind speed data shows westerly wind with an average speed of 3.6 ms^{-1}, which resulted in increased exposure to air pollution in the east.

Relative humidity is also one of the most common drivers of changes in PM concentrations and generally shows a positive correlation with PM_{10} up to a threshold value beyond which the correlation ceases (Hernandez et al., 2017). This was evident as the RH value range increased at AQ1 through to AQ3, the PM_{10} concentrations also corresponded accordingly. That can be explained considering that as humidity increases, moisture particles start clinging onto particulate matter and consequently increase its concentration. Eventually, moisture particles grow in size and become heavy to a point where downward force of gravity causes the deposition process and PM_{10} concentration begins to decrease (Hernandez et al., 2017).

Lastly, another factor that could possibly contribute to the elevated level of PM_{10} concentration at AQ3 was likely due to its close proximity to the Comoro River, where daily sand mining activities lead to increased dust deposition to nearby residential areas. As there was no rainfall for four consecutive days prior to the sampling date, winds and traffic of vehicles would intensify the re-suspension of dust around the area.

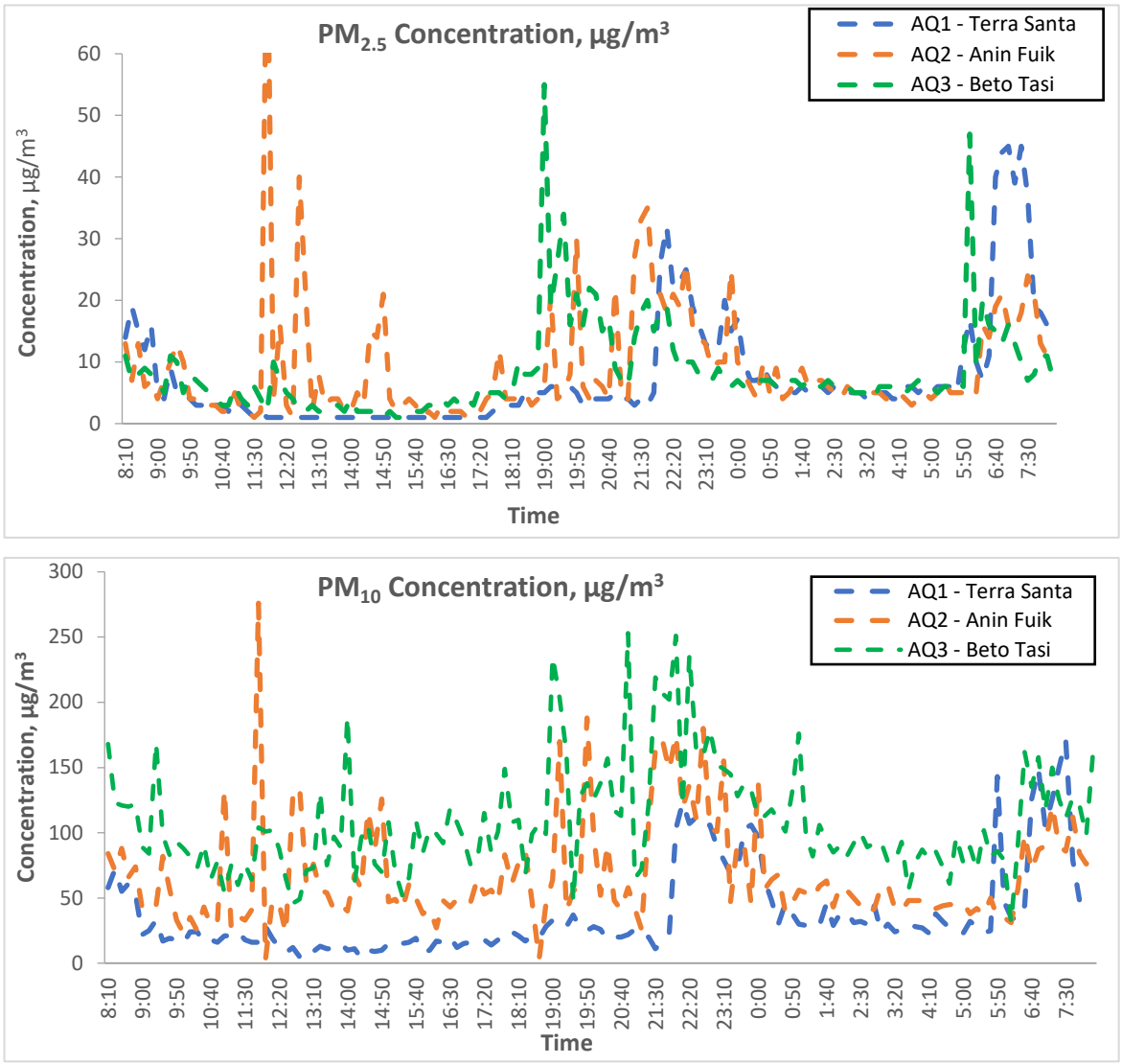


Figure 1.5 Combined PM2.5 and PM10 concentrations of the 3 sampling locations (AQ1, AQ2, AQ3)

d. Nitrogen dioxide (NO_2)

NO_2 at all points was below the detection limit of 1 µg/m³.

e. Nitric oxide (NO)

NO at all points was below the detection limit of 1 µg/m³.

f. Sulphur dioxide (SO_2)

SO_2 at all points was below the detection limit of 1 µg/m³.

g. Carbon monoxide (CO)

CO at all points was below the detection limit of 1 µg/m³.

h. Ozone (O_3)

O_3 at all points was below the detection limit of 1 µg/m³.

Table 1.3 All air quality parameters measured and compared against WHO AQG and MAAQS.

Parameter	Monitoring stations	Averaging period	Measured values (µg/m³)	WHO AQG values (µg/m³)	MAAQS Values (µg/m³)
$PM_{2.5}$	AQ1	24-hour	8	25	35
	AQ2	24-hour	9	25	35
	AQ3	24-hour	8	25	35
PM_{10}	AQ1	24-hour	38	50	100
	AQ2	24-hour	68	50	100
	AQ3	24-hour	109	50	100
SO_2	AQ1 – AQ3	24-hour	< 1	20	80
NO_2	AQ1 – AQ3	1-hour	< 1	200	280
NO	AQ1 – AQ3	1-hour	< 1	200	280
CO	AQ1 – AQ3	1-hour	< 1	30,000	30,000
O_3	AQ1 – AQ3	1-hour	< 1	-	180

1.2. Noise

1.2.1. Sampling Methodology

To monitor the noise baseline conditions around the project area, four (4) locations representing sensitive noise receptors were selected and baseline data collected at each. Two (2) locations were chosen to measure the aircraft noise (AN) and the other two 2 for traffic noise (TN). For aircraft monitoring points, the first point (AN1) was located roughly 350m south of west end of runway whilst the second point (AN2) was chosen to be on the extended line of the existing runway.

The traffic noise monitoring points, TN1 and TN2, were positioned along the main road where traffic volume might increase after expansion of the airport, as shown in Figure 1.6.

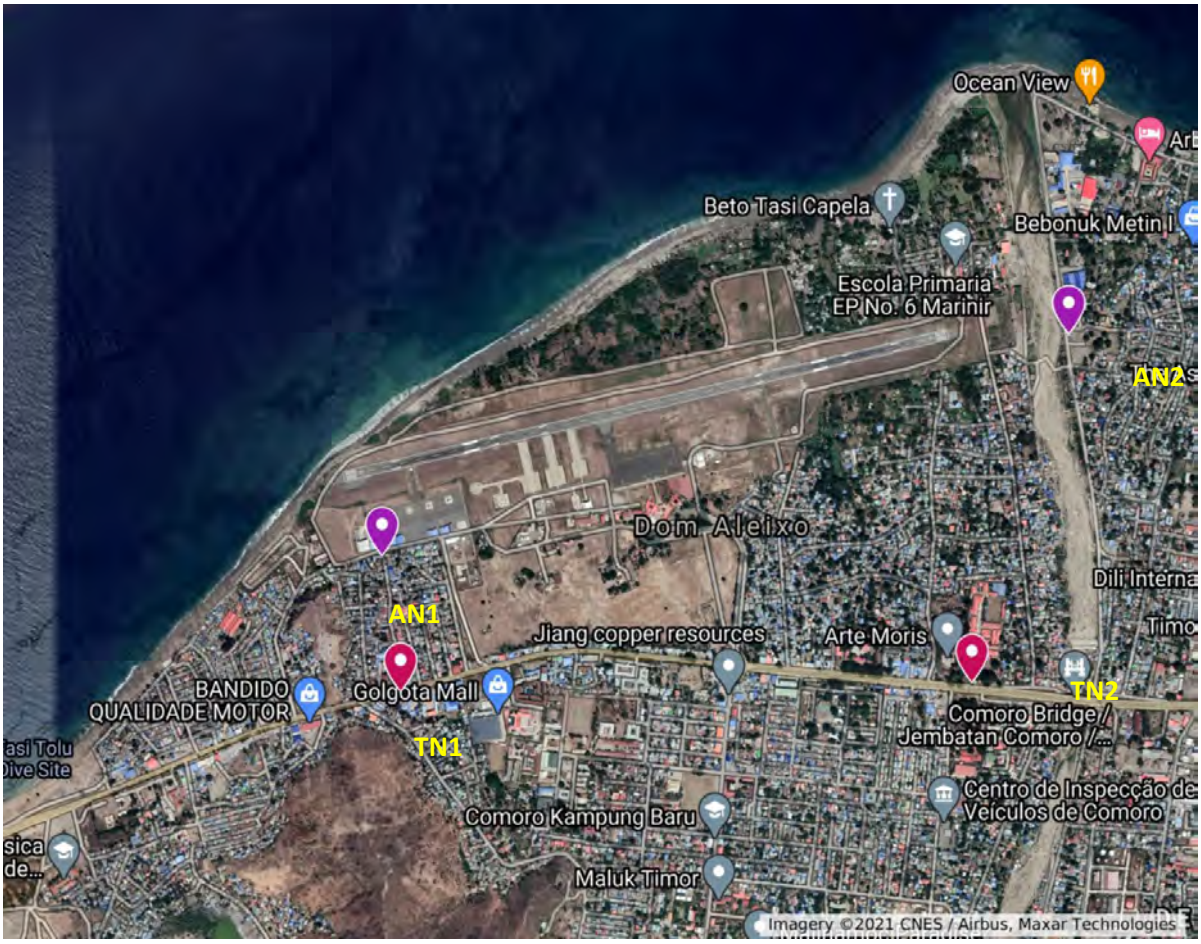


Figure 1.6 Location of noise measurement points

Table 1.4 Coordinates of noise baseline measurement point

Measurement point	Location	Description	Coordinates
AN1	Terra Santa	Settlement area	-8.55043, 125.51744
AN2	Bebonuk	Settlement area	-8.54465, 125.53606
TN1	Terra-Santa	Main road	-8.55397, 125.51793
TN2	Beto Leste	Main road	-8.55374, 125.53342

The baseline study measured the Equivalent A-weighted Continuous Sound Level (LAeq) and Day-Night Sound Level (Ldn). The LAeq is a measure of the average environmental noise levels to which people are exposed. It is an indication of amount of sound energy equivalent to the energy of a continuous sound.

The Day-Night Sound Level (Ldn) is a descriptor of noise level based on the energy-equivalent noise level (LAeq) over the whole day with a penalty of 10 dBA for night time noise (22:00 to 07:00). This metric corresponds well to human annoyance levels and normally used for noise planning purposes to designate areas appropriate for residential use (FHWA 2020). The penalty is introduced to indicate people's extra sensitivity to noise during the night.

Generally, the Equivalent Continuous Sound Level (LAeq) is used to assess and measure road traffic noise level, whereas the Day-Night Average Sound Level (Ldn) is the preferred metric for determining noise level exposure at airports.

For the road traffic noise level, WHO guidelines set the equivalent continuous sound pressure level (LAeq) limit at 70 dB (WHO, 2011). As for the average noise exposure level produced by aircraft, WHO strongly recommends reducing noise levels below 45 dBA Lden (WHO, 2018). Since Dili Airport does not operate during evening hours (between 7 pm – 10 pm), this Lden guideline value is applicable to Ldn.

Noise baseline for both aircraft and traffic were measured every hour for 5 minutes over a 24-hour period (from 7 AM). The monitoring interval time is one second. The traffic noise measurements were conducted on from 29th December 2019 until 30th December 2019, whereas the aircraft noise measurements were carried out from 8th of January 2021 until 9th of January 2021. The sound level meter used to measure noise level is Benetech GM-1356.

Traffic count

The traffic count survey was conducted for a duration of 1 day (24 hours) from 7 AM 29th December until 7 AM 30th December.

For recording traffic count at TN1 and TN2, the procedures are as follows:

- Traffic going opposite directions, east and west, were recorded.
- There were two surveyors recording traffic flow every hour for each direction, except during non-peak hours from 11 PM – 7 AM, where one surveyor was sufficient.
- The two surveyors each had a task. One was observing the traffic and the other surveyor to record on the data sheet.

Equipment:

SOUND LEVEL METER (Model: GM 1356)

- Accuracy up to +/- 1.5 dBA (reference sound pressure standard, 94dB@1KHz)
- Measuring range is 30 dBA to 130 dBA
- Frequency response is 31.5Hz – 8.5Hz
- Fast/Slow Time weighting selection
- Data storage quantity: 4700 data record
- Operating condition temperature : 0-40 ^{0}C
- Humidity condition : ≤ 80% RH
- Calibration sound source: 94dB@1KHz
- Data that collected directly in the field or project location
- Data collected every 5 second during 10 minutes

1.2.2. Results

Based on the road traffic noise measurements at TN1 – Terra Santa Road, the value of Equivalent Continuous Sound Level (Leq) was 71.6 dBA. The Day-time Sound Level, Ld (07:00 – 22:00) value was 73.1 dBA and the Night-time Sound Level, Ln (22:00 – 07:00) value was 66.0 dBA.

The Equivalent Continuous Sound Level (Leq) value of 71.6 dBA was similar to the study conducted in 2019 at the same or nearby location, which had an Leq value of 71.5 dBA (ADB 2019). This value, however, exceeded the WHO Guidelines value for traffic areas of 70 dBA.

Table 1.5 Leq, Ld and Ln for TN1

	TN1
Equivalent Continuous Sound Level, Leq (07:00 – 07:00)	71.6 dBA
Day-time level, Ld (07:00 – 22:00)	73.1 dBA
Night-time level, Ln (22:00 – 07:00)	66.0 dBA

- Traffic noise at location TN2 –Presidenti Nicolau Lobato Road, Beto Leste

Figure 1.7 Noise survey at TN2.

Traffic noise measurements at TN2 resulted in the value of Equivalent Continuous Sound Level (Leq) of 69.9 dBA. This value meets WHO guidelines value limit of 70 dBA for traffic areas.

Table 1.6 Leq, Ld and Ln for TN2.

	TN2
Equivalent Continuous Sound Level, Leq (07:00 – 07:00)	69.9 dBA
Day-time level, Ld (07:00 – 22:00)	71.5 dBA
Night-time level, Ln (22:00 – 07:00)	64.5 dBA

Leq were 71.6 dBA and 69.9 dBA, respectively. The Leq value at TN1 did not meet WHO guideline value of 70 dBA, whilst the Leq value at TN2 was just at the guideline limit. It was noted that the most significant contributor to high traffic noise level readings, apart from vehicle horn and exhaust, was sirens from emergency vehicles, such as ambulances and police cars.

Traffic count

- **Traffic count at T1**

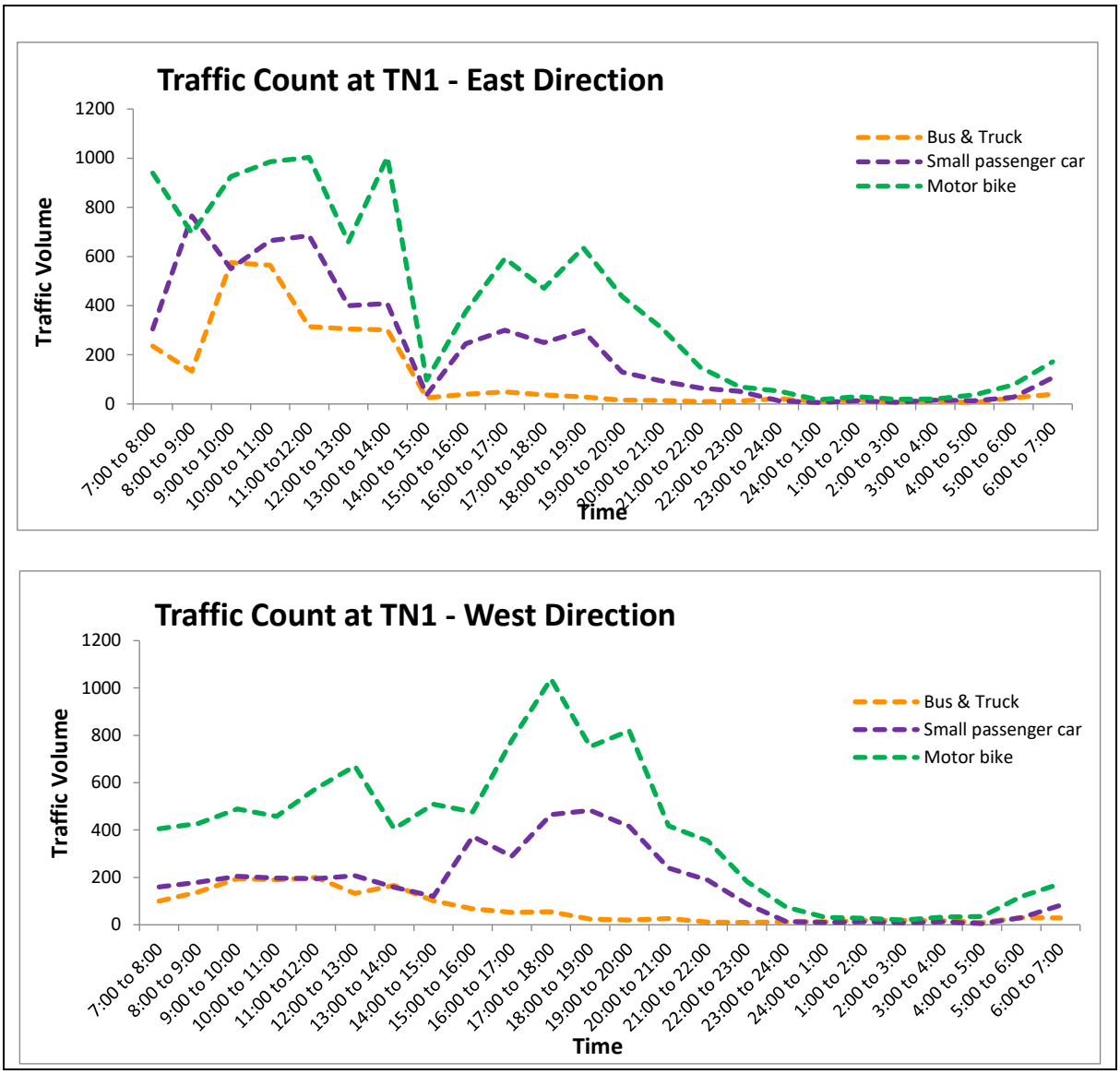


Figure 1.8 Traffic volume going east (above) and west (below).

Traffic volume going east was at peak from 9 AM to 1 PM. The dominant vehicle type was motorbikes. At 2 PM, number of vehicles fell drastically as the traffic was rerouted to other roads. It was done to resolve the delay in traffic movement due to graduation ceremony taking place at the TN1 road direction. From 11 PM to 6 AM, the traffic volume was low and steadied.
The peak hour for traffic going west was in the afternoon from 4 PM to 7 PM. The majority of vehicle was still the motorbikes. The volume of traffic started to decline from 8 PM and levelled off from 11 PM until 5 AM.

- **Traffic count at TN2**

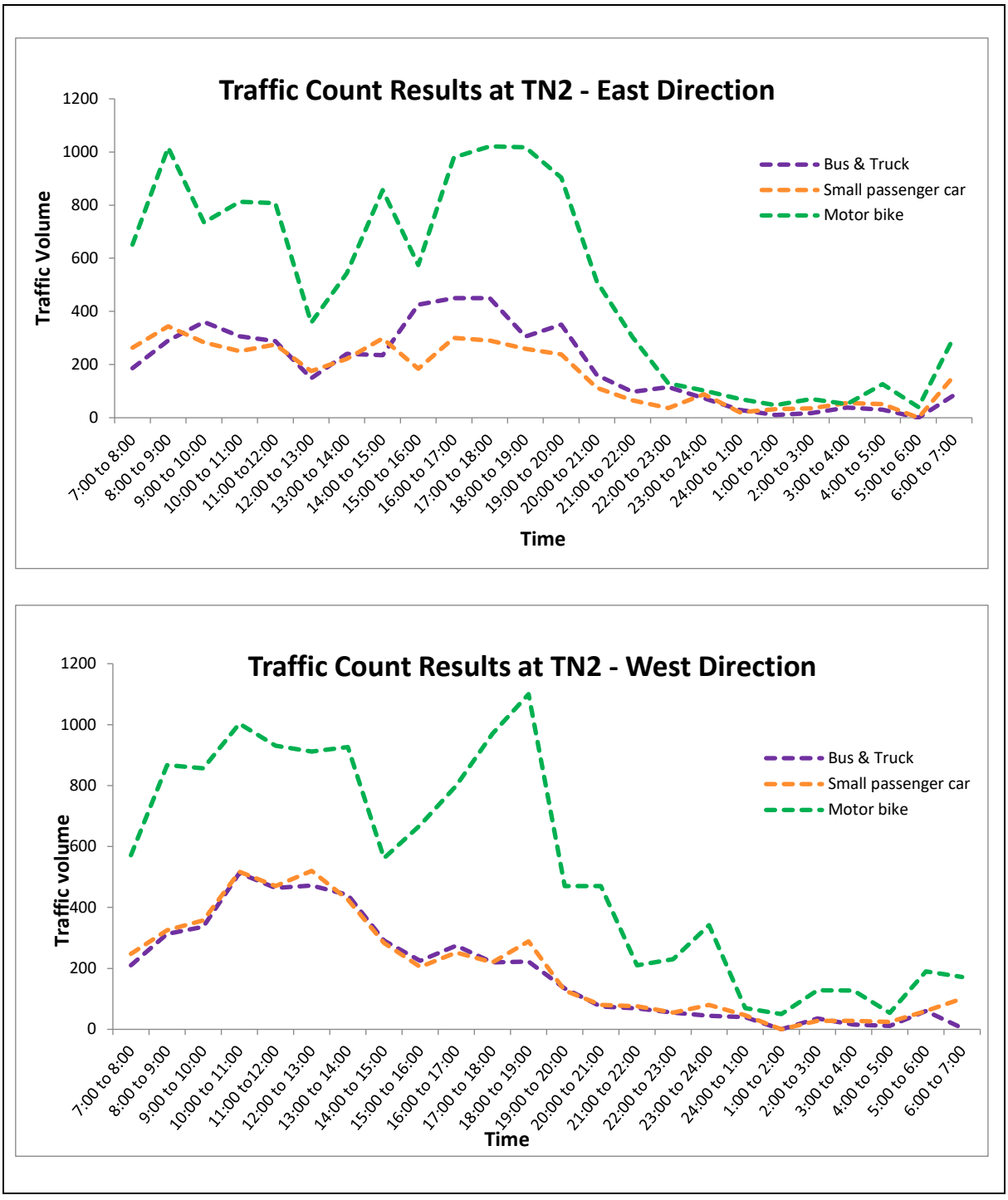


Figure 1.9 Traffic volume going east (above) and west (below).

The traffic going east at TN2 was at peak volume at 8 AM and dropped significantly at 1PM due to people rerouting using other roads. It reached its peak again in the afternoon from 4 PM until 7 PM and started declining when it leveled off from 11 PM until the morning hours. The traffic was mostly dominated by motorbikes.

Similar to the east direction, vehicles volume going west also peaked at 8 AM and declined at 1 PM. The decline was due to traffic jam going westward, thus people preferred to reroute. Motorbike

numbers going west increased significantly at 6 PM, due to incoming New Year celebration where people travelled back to their homes in other municipalities. The volume began to decline from 8 PM until early morning hours.

1.3. Soil

1.3.1. Sampling Methodology

Samples were collected using a wooden scoop to ensure that samples were not contaminated, particularly for metals analyses (see Figure 1.10 below). Three (3) replicates were taken at each location within approximately 2m of each other to ensure reproducibility in the sampling method and to ensure representative samples were taken. Samples were collected into a clean, sealable plastic bag.

Figure 1.10 Soil sample collections in one of the locations inside PNLIA.

The replicates were then co-mingled to make a homogenous sample which was then place in the sample bottle, i.e. 1 x 250mL Soil Glass Jar - Unpreserved, with an orange label. Each of the 5 locations followed the same procedures.

Soil samples were collected at each of the sampling sites as shown below:

Figure 1.11 Soil sample locations around the PNLIA.

Table 1.7 – Coordinates for soil sample locations.

Sample Name	Decimal degrees (DD)	Degrees, minutes, and seconds (DMS)
SOL 1	-8.5444044, 125.5333827	8°32'39.9"S 125°32'00.2"E
SOL 2	-8.5442466, 125.5278342	8°32'39.3"S 125°31'40.2"E
SOL 3	-8.5487182, 125.5160975	8°32'55.4"S 125°30'58.0"E
SOL 4	-8.5488800, 125.5220654	8°32'56.0"S 125°31'19.4"E
SOL 5	-8.5504294, 125.5236271	8°33'01.6"S 125°31'25.1"E

1.3.2. Results

Table 1.8 Soil baseline analysis

		S1	S2	S3	S4	S5
		05-Apr-2021 00:00	05-Apr-2021 00:00	05-Apr-2021 00:00	05-Apr-2021 00:00	05-Apr-2021 00:00
Compound	**Unit**	**Result**	**Result**	**Result**	**Result**	**Result**

Moisture Content	%	5,2	19,1	6,9	14	20,3
Arsenic	mg/kg	8	11	6	11	10
Cadmium	mg/kg	<1	<1	<1	<1	<1
Chromium	mg/kg	6	11	5	10	11
Copper	mg/kg	18	30	16	24	29
Lead	mg/kg	16	29	16	26	32
Nickel	mg/kg	13	21	11	20	20
Zinc	mg/kg	45	76	39	66	100
Total Polychlorinated biphenyls	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Decachlorobiphenyl	%	96,6	88,4	93,9	90,6	79,7

1.4. Marine Sediment

1.4.1. Sampling Methodology

Marine sediment samples were taken at four given sampling locations on the western side of the existing runway at PNLIA (see Figure M.1). The coordinates for the sampling locations are shown in table M.1. Each sampling location has a different distance from the shoreline. The furthest location is the sediment location no.2 which is approximately 65m from the shoreline. Moreover, each location has relatively different water depth with location 1 and 2 recorded as deeper with 7m water depth respectively as shown in the dive log report (see Figure M.2).

Figure M.1 Marine sediment sampling locations.

Table M.1 Coordinates of the marine sediment sampling locations

Sample Name	Longitude	Latitude
SED 1	125°30'58.11"E	8°32'51.77"S

SED 2	125°30'55.09"E	8°32'52.67"S
SED 3	125°30'54.80"E	8°32'54.70"S
SED 4	125°30'49.21"E	8°33'1.40"S

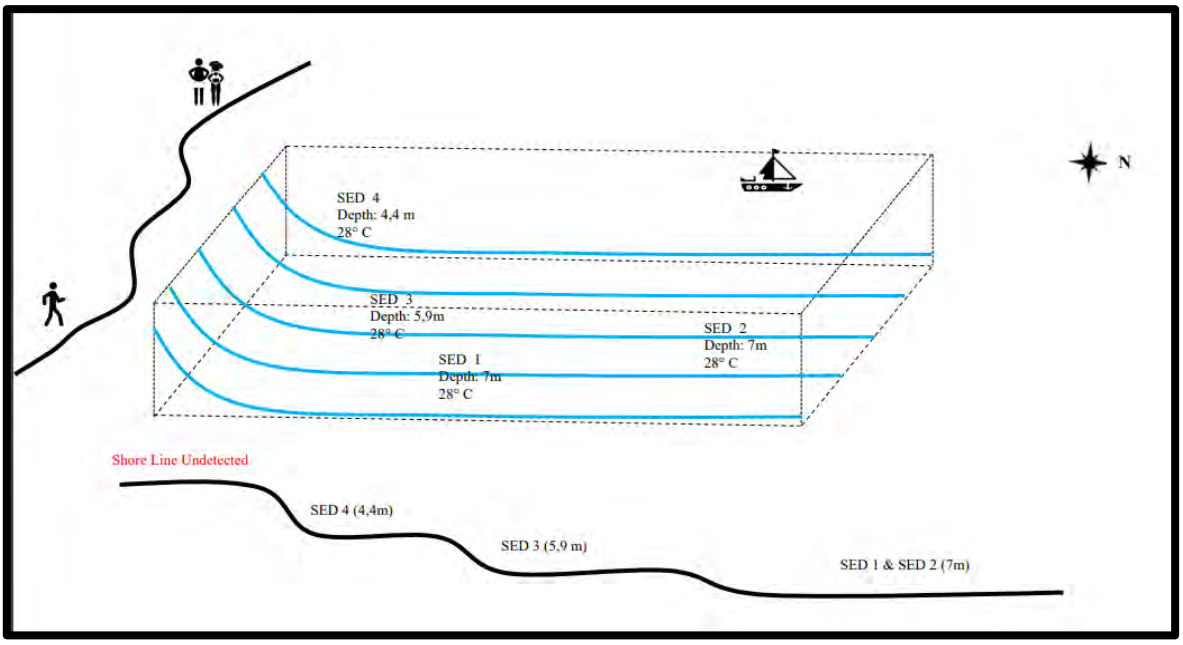


Figure M.2 Dive Log Report

a). Scope of work requirements

Sediment	Color, Odor, Ignition loss, Sulfide, COD, Hg, Cd, Cu, Zn, Pb	-	Once (In December only)	4 points

Additional analyses were requested by the Client to understand the acid sulphate content of the sediment:

- TAA – Titratable Actual Acidity
- TPA – Titratable Peroxide Acidity
- TSA – Titratable Sulfidic Acidity
- Sulfur trail
- Calcium values
- Magnesium values
- ANC – Acid Neutralising Capacity
- Net Acidity

b). Methodology

The samples were collected by the two divers (main diver and assistance diver) using a local fisherman boat. A handheld GPS was used to position the exact coordinates corresponding to the given locations. Diver computer was also used to record the water depth and temperature for each sampling location as shown in Figure M.2 above. Prior to conducting the diving operation, divers were briefed on the shore on the sampling procedures (Figure M3).

Samples were taken at each site from a depth of 25cm below the seabed surface. Samples were collected using a plastic scoop to ensure that samples will not be contaminated, particularly for metals analyses. Three replicates were taken at each location within approximately 2m of each other to ensure reproducibility in the sampling method and to ensure representative samples are taken.

Samples were collected into a clean and labeled plastic bag and returned to the surface. The replicates were co-mingled at the surface to make a homogenous sample which was then placed in the sample jar provided by the laboratory, as follows:

- 1x 250mL Soil Glass Jar - Unpreserved, with an orange label.
- 1 x 1Medium Snap Lock Bag for SPOCAS analysis (approximately 300 gram for each sampling location).

c). Field Observation

- Colour - photograph and short written description to discern any "black" colouring
- Odour - olfactory test to discern any "black colouring" indicating H_2S

The sample containers and the zip lock bags for SPOCAS were put inside the esky immediately after sorting and packing. After that the sediment samples were taken home for proper storage and preservation. Sample containers were put in the refrigerator, while the SPOCAS were put in the fridge as they need to be kept frozen all the time. Some field photos are provided in figure M.3. below.

Figure M.3 Marine sediment sampling briefing, collection and packing.

Together with soil samples, marine sediments were then brought to IPG (Instituto do Petreoleo e Geologia) to weigh and issue a recommendation letter to ANPM (Autoridade Nasional do Petroleo e Minerais) for approval to send the samples to ALS laboratory for analysis.

1.5. Coastal Water

1.5.1. Sampling Methodology

Coastal water samples were collected from the same locations of coastal sediment shown in Figure 1.12 and Table 1.11 below. The baseline study measures coastal water parameters such as in Table 1.10.

Table 1.10 Scope of work requirement

Item	Parameter	Averaging period	Frequency	Location
Coastal water	Turbidity, total suspended solids (TDS), temperature, salinity, conductivity, pH, total faecal coliform count, nitrates and phosphates.	-	Once	4 points

A sufficient volume of seawater was collected at each of the agreed sampling stations on which to perform the physico-chemical analyses detailed above. The field observation was conducted to measure the physical parameters of the coastal water using multi-probe membrane filtration for

bacteriological testing. The bacteriological testing was analysed at the National Directorate of Water & Sanitation Laboratory. Other parameters were tested and analysed by the ALS laboratory. Samples were collected approximately 25cm below the surface using a sterile sample water bottle. Then samples were placed into clear plastic samples bottles.

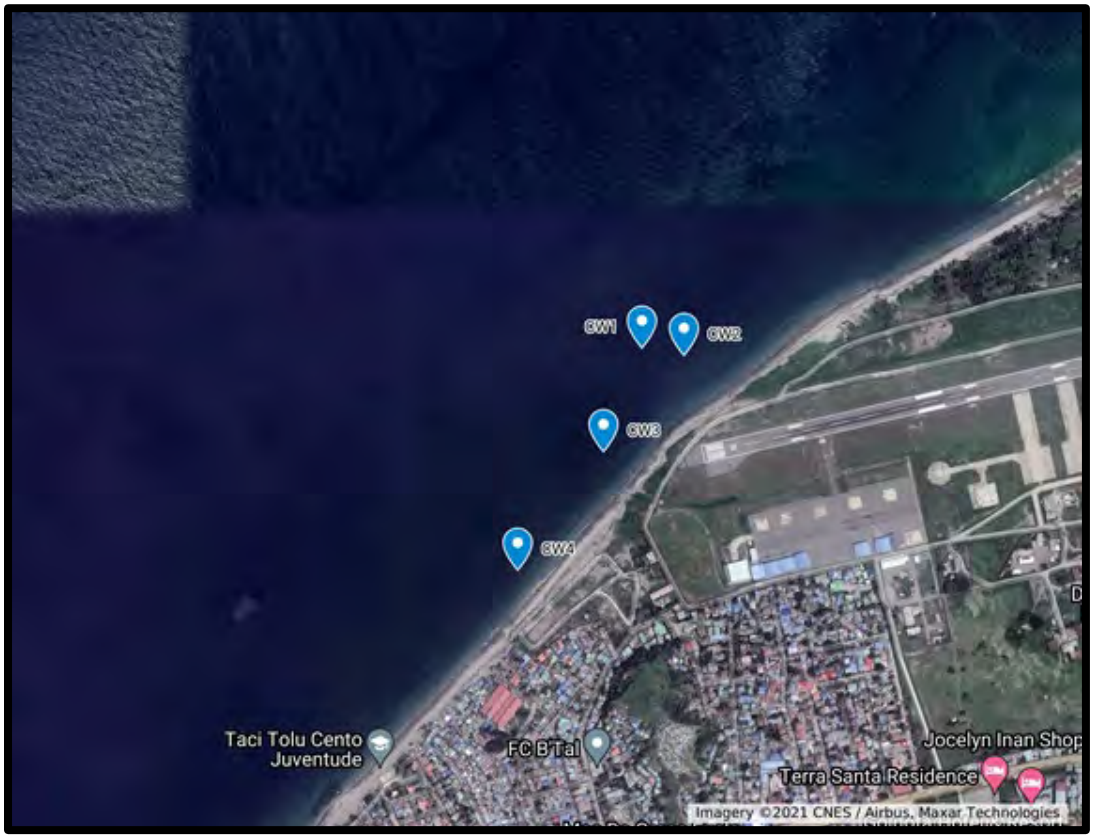


Figure 1.12 Coastal water sample locations similar to marine Sediment Sample Locations

Table 1.11 Marine Water Sample Locations.

Sample Name	Longitude	Latitude
CW1	125°30'55.8"E	8°32'48.4"S
CW2	125°30'58.1"E	8°32'48.8"S
CW3	125°30'53.7"E	8°32'54.0"S
CW4	125°30'49.0"E	8°33'00.4"S

Samples were placed into the clear plastic sample bottles as follows:

· Green: 1 x 500mL Clear Plastic Bottle (Natural) test parameters such as Suspended Solids - Standard Level, Turbidity, Salinity, pH, EC, Nitrate, Reactive P

· Purple: 1 x 60mL Clear Plastic Bottle (Sulfuric Acid) test nitrate calculation

Table 1.12 ALS Laboratory specification.

Parameter	ALS Code	Technique/ Method Reference	Limit Of Reporting (LOR)
Turbidity	EA045	APHA 2130 B	0.1 NTU
Suspended Solids - Standard Level	EA025H	APHA 2540 D	5 mg/L
Salinity	EA020-EC-P	APHA 2520 B, APHA 2510 B	0.01 g/kg, 1 µS/cm
Electrical Conductivity (PCT)	EA010P	APHA 2510 B	1 µS/cm
pH (PCT)	EA005P	APHA 4500-H+ B	0.01 pH Unit
Nitrate as N by Discrete Analyser	EK058G	APHA 4500-NO3 F, APHA 4500-NO2 B	0.01 mg/L
Reactive Phosphorus by Discrete analyser	EK071G	APHA 4500-P F	0.01 mg/L

Label Colour	Container Type (Preservation noted if required)	Test Parameter(s)
Green	1 x 500mL Clear Plastic Bottle - Natural	Suspended Solids - Standard Level, Turbidity, Salinity, pH, EC, Nitrate, Reactive P
Purple	1 x 60mL Clear Plastic Bottle - Sulfuric Acid	Nitrate Calculation

1.5.2. Results

Table 1.13 Physical testing and bacteriological testing from Local Lab.

Physical Testing & Bacteriological Testing					
Coastal sample	**Parameter**	**Unit**	**Result**	**WHO/East Timor guideline**	**Testing method**
CW1	**pH Value**	-	**8.7**	6.5-8.5	pH Meter
	Electrical Conductivity	µS/cm	**56800**	NS	Conductivity meter
	TSS	mg/L	**0.14**	NS	Gravimetry
	TDS	mg/L	**28400**	NS	Gravimetry
	Salinity	‰	**37.8**	NS	Conductivity meter
	Temperature	°C	**28.4**	NS	Conductivity meter

	Turbidity	NTU	**0.6**	5 (NTU)	Turbidity meter
	Total coliform	CFU/100mL	**0**	0	Membrane filtration
	E.coli	CFU/100mL	**0**	0	Membrane filtration
CW2	**pH Value**	-	**8.7**	6.5-8.5	pH Meter
	Electrical Conductivity	µS/cm	**59100**	NS	Conductivity meter
	TSS	mg/L	**0.13**	NS	Gravimetry
	TDS	mg/L	**29500**	NS	Gravimetry
	Salinity	‰	**39.5**	NS	Conductivity meter
	Temperature	°C	**28.9**	NS	Conductivity meter
	Turbidity	NTU	**0.5**	5 (NTU)	Turbidity meter
	Total coliform	CFU/100mL	**0**	0	Membrane filtration
	E.coli	CFU/100mL	**0**	0	Membrane filtration
CW3	**pH Value**	-	**8.8**	6.5-8.5	pH Meter
	Electrical Conductivity	µS/cm	**23800**	NS	Conductivity meter
	TSS	mg/L	**0.11**	NS	Gravimetry
	TDS	mg/L	**11880**	NS	Gravimetry
	Salinity	‰	**14.4**	NS	Conductivity meter
	Temperature	°C	**29.0**	NS	Conductivity meter
	Turbidity	NTU	**0.3**	5 (NTU)	Turbidity meter
	Total coliform	CFU/100mL	**0**	0	Membrane filtration
	E.coli	CFU/100mL	**0**	0	Membrane filtration
CW4	**pH Value**	-	**8.8**	6.5-8.5	pH Meter

	Electrical Conductivity	µS/cm	**59800**	NS	Conductivity meter
	TSS	mg/L	**0.1**	NS	Gravimetry
	TDS	mg/L	**29700**	NS	Gravimetry
	Salinity	‰	**39.8**	NS	Conductivity meter
	Temperature	°C	**29.8**	NS	Conductivity meter
	Turbidity	NTU	**0.4**	5 (NTU)	Turbidity meter
	Total coliform	CFU/100mL	**0**	0	Membrane filtration
	E.coli	CFU/100mL	**0**	0	Membrane filtration

Table 1.14 Coastal Water Analyses by ALS lab.

		CW1	**CW2**	**CW3**	**CW4**
		05-Apr-2021 00:00	**05-Apr-2021 00:00**	**05-Apr-2021 00:00**	**05-Apr-2021 00:00**
Compound	**Unit**	**Result**	**Result**	**Result**	**Result**
pH Value	pH Unit	8,05	8,14	8,14	8,18
Electrical Conductivity @ 25C	µS/cm	51400	51000	51200	11
Total Dissolved Solids @180C	mg/L	-	-	-	-
Salinity	g/kg	33,7	33,6	33,6	33,6
Suspended Solids (SS)	mg/L		<5	<5	<5
Colour (True)	PCU	-	-	-	-
pH Colour	pH Unit	-	-	-	-
Turbidity	NTU	<0,1	<0,1	<0,1	<0,1
Nitrite as N	mg/L	<0,01	<0,01	<0,01	<0,01
Nitrate as N	mg/L	<0,01	<0,01	<0,01	<0,01
Nitrite + Nitrate as N	mg/L	<0,01	<0,01	<0,01	<0,01
Reactive Phosphorus as P	mg/L	<0,01	<0,01	<0,01	<0,01

1.6. Surface Water

1.6.1. Sampling Methodology

Surface (river) water samples were collected from two locations SF1 and SF2 in the Comoro River. SF1 was collected in the downstream and SF2 was collected in the upstream of the Comoro River as shown in Figure 1.13. The surface water was tested for its parameters including pH, temperature, transparency, color, turbidiy, TSS, TDS, DO, BOD, T-N, T-P, NH3-N, Hg, Cd, Cu, Zn, Pb, oil & grease, total coliforms count. A sufficient volume of river water was collected at each of the agreed sampling locations on which to perform the physico-chemical analyses detailed above. Samples were collected approximately 25cm below the surface using a sterile water bottle. The field observation was conducted on site to measure the physical parameters using multi-probe. The bacteriological testing was analysed at the National Directorate of Water & Sanitation Laboratory. Other parameters were tested and analysed by ALS Laboratory.

Table 1.15 Scope of work requirement

Item	Parameter	Averaging period	Frequency	Location
Surface water	pH, temperature, transparency, color, turbidity, TSS, TDS, DO, BOD, T-N, T-P, NH_3-N, Hg, Cd, Cu, Zn, Pb,Oil & Grease, Total coliforms	-	Once	2 points

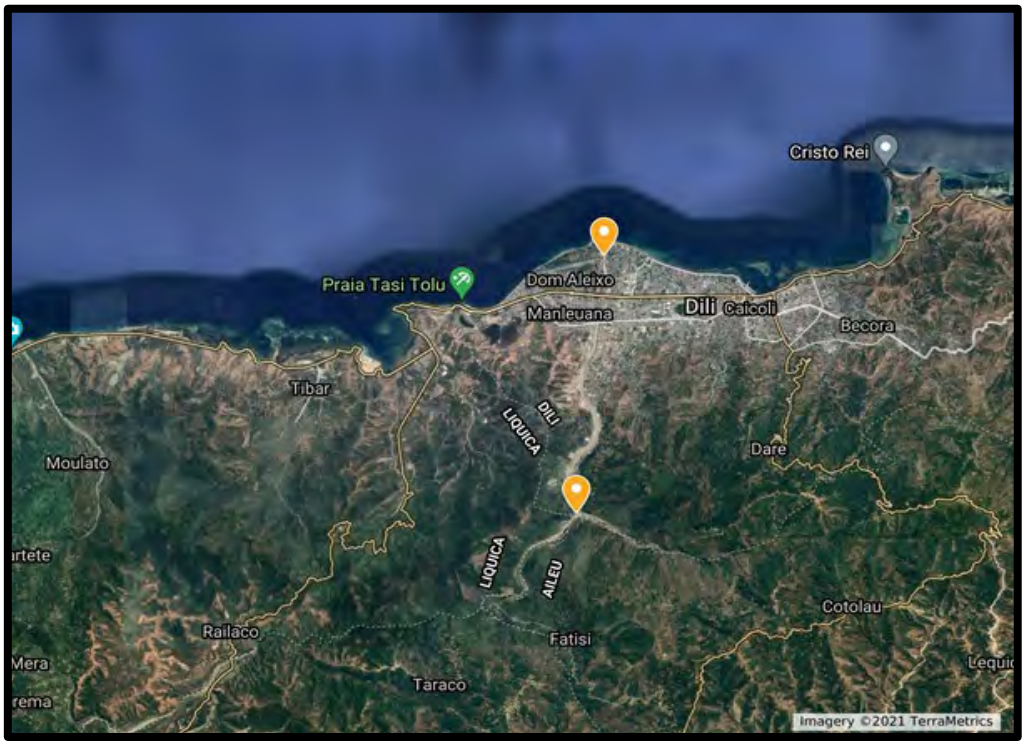


Figure 1.13 Surface water sample locations upstream and downstream in Comoro River, Dili.

Table 1.16 Surface water sample locations/coordinates

Sample Name	Longitude	Latitude

SF1	125°32'07.6"E	8°32'44.2"S
SF2	125°31'41.4"E	8°36'46.4"S

Table 1.17 ALS Laboratory Specification

Parameter	**ALS Code**	**Technique/ Method Reference**	**Limit Of Reporting (LOR)**
pH (PCT)	EA005P	APHA 4500-H+ B	0.01 pH Unit
UV Transmission at 254 nm	EA044 @ 254 nm	In house	0.01 %
Colour (True)	EA041	APHA 2120 B	0.01 pH Unit, 1 PCU
Turbidity	EA045	APHA 2130 B	0.1 NTU
Suspended Solids - Standard Level	EA025H	APHA 2540 D	5 mg/L
Total Dissolved Solids - Standard Level	EA015H	APHA 2540C	10 mg/L
Dissolved Oxygen (DO)	EP025	APHA 4500-O G	0.1 mg/L
BOD	EP030	APHA 5210 B	2 mg/L
Total Nitrogen and Total Phosphorus	NT-11	APHA 4500-P B&F, APHA 4500-Norg/NO3, APHA 4500-Norg D, APHA 4500-NO3 F	0.01 - 0.1 mg/L
Ammonia as N By Discrete Analyser	EK055G	APHA 4500-NH3 G	0.01 mg/L
Total Metals by ICP/MS Cd, Cu, Pb, Zn including digestion	EG020T	USEPA 6020	0.0001 - 0.005 mg/L
Dissolved Mercury	EG035F	APHA 3112- Hg B	0.0001 mg/L
Oil & Grease (O&G)	EP020	APHA 5520 B	5 mg/L

Label Colour	**Container Type (Preservation noted if required)**	**Test Parameter(s)**
Green	1 x 500mL Clear Plastic Bottle - Natural	pH, UV transmission, Colour, Turbidity, TSS, TDS, DO
Purple	1 x 60mL Clear Plastic Bottle - Sulfuric Acid	TN, TP, Ammonia
Purple	1 x 250mL Amber Jar - Sulfuric Acid or Sodium Bisulfate	Oil & Grease

Red	1 x 60mL Clear Plastic Bottle - Nitric Acid; Unfiltered	Total Mercury, Total Metals by ICP/MS

1.6.2. Results

Table 1.17 Physical testing and bacteriological testing result from local lab.

Physical Testing & Bacteriological testing					
Surface water Sample /river	**Parameter**	**Unit**	**Result**	**WHO/East Timor guideline**	**Testing method**
SF1	**pH Value**	-	**8.4**	6.5-8.5	pH Meter
	Electrical Conductivity	µS/cm	**392**	NS	Conductivity meter
	TSS	mg/L	**0.7**	NS	Gravimetry
	TDS	mg/L	**196.2**	NS	Gravimetry
	Salinity	‰	**0.2**	NS	Conductivity meter
	Temperature	°C	**27.9**	NS	Conductivity meter
	Turbidity	NTU	**824**	5 (NTU)	Turbidity meter
	Total coliform	CFU/100mL	**TNC**	0	Membrane filtration
	E.coli	CFU/100mL	**TNC**	0	Membrane filtration
SF2	**pH Value**	-	**8.7**	6.5-8.5	pH Meter
	Electrical Conductivity	µS/cm	**444**	NS	Conductivity meter
	TSS	mg/L	**0.6**	NS	Gravimetry
	TDS	mg/L	**222**	NS	Gravimetry
	Salinity	‰	**0.2**	NS	Conductivity meter
	Temperature	°C	**28.0**	NS	Conductivity meter
	Turbidity	NTU	**657**	5 (NTU)	Turbidity meter
	Total coliform	CFU/100mL	**TNC**	0	Membrane filtration
	E.coli	CFU/100mL	**TNC**	0	Membrane filtration

Table 1.18 Surface Water Baseline Analyses by ALS Lab.

		SF1	SF2
		05-Apr-2021 00:00	05-Apr-2021 00:00
Compound	**Unit**	**Result**	**Result**
pH Value	pH Unit	8,11	8,35
Total Dissolved Solids @180C	mg/L	228	238
Suspended Solids (SS)	mg/L	619	572
Colour (True)	PCU	5	<1
pH Colour	pH Unit	8,33	8,33
UV Transmission @254nm	%	93,8	97,2
Turbidity	NTU	538	473
Dissolved Metals by ICP-MS			
Arsenic	mg/L	-	-
Cadmium	mg/L	-	-
Copper	mg/L	-	-
Lead	mg/L	-	-
Zinc	mg/L	-	-
Total Metals by ICP-MS			
Cadmium	mg/L	<0,0001	<0,0001
Copper	mg/L	0,018	0,013
Lead	mg/L	0,021	0,014
Zinc	mg/L	0,067	0,052
Dissolved Mercury	mg/L	<0,0001	<0,0001
Ammonia as N	mg/L	0,05	0,1
Nitrite + Nitrate as N	mg/L	0,27	0,22
Total Kjeldahi Nitrogen as N	mg/L	<0,5	0,4
Total Nitrogen as N	mg/L	<0,5	0,6
Total Phosphorus as P	mg/L	0,37	0,33
Oil & Grease	mg/L	<5	<5
Dissolved Oxygen	mg/L	9,6	9,7
Biochemical Oxygen Demand	mg/L	5	7

1.7. Ground Water

1.7.1. Sampling Methodology

Groundwater samples were taken from the three agreed locations including groundwater GW1 in Raikotu, GW2 in Beto and GW3 in Bebonuk (Figure 1.14 and Table 1.20). A sufficient volume of groundwater was collected at each of the agreed sampling stations on which to perform the physico-chemical analyses detailed above. The field observation was conducted to measure the physical parameters on site using multi-probe and bacteriological testing was analysed by the National Directorate of Water and Sanitation Laboratory.

Table 1.19 Scope of work requirement

Item	Parameter	Averaging period	Frequency	Location
Groundwater	pH, temperature, color, turbidity, TSS, TDS, DO, NH_3-N, Hg, Cd, Cu, Zn, Pb,Oil & Grease, Total coliforms	-	Once	3 points

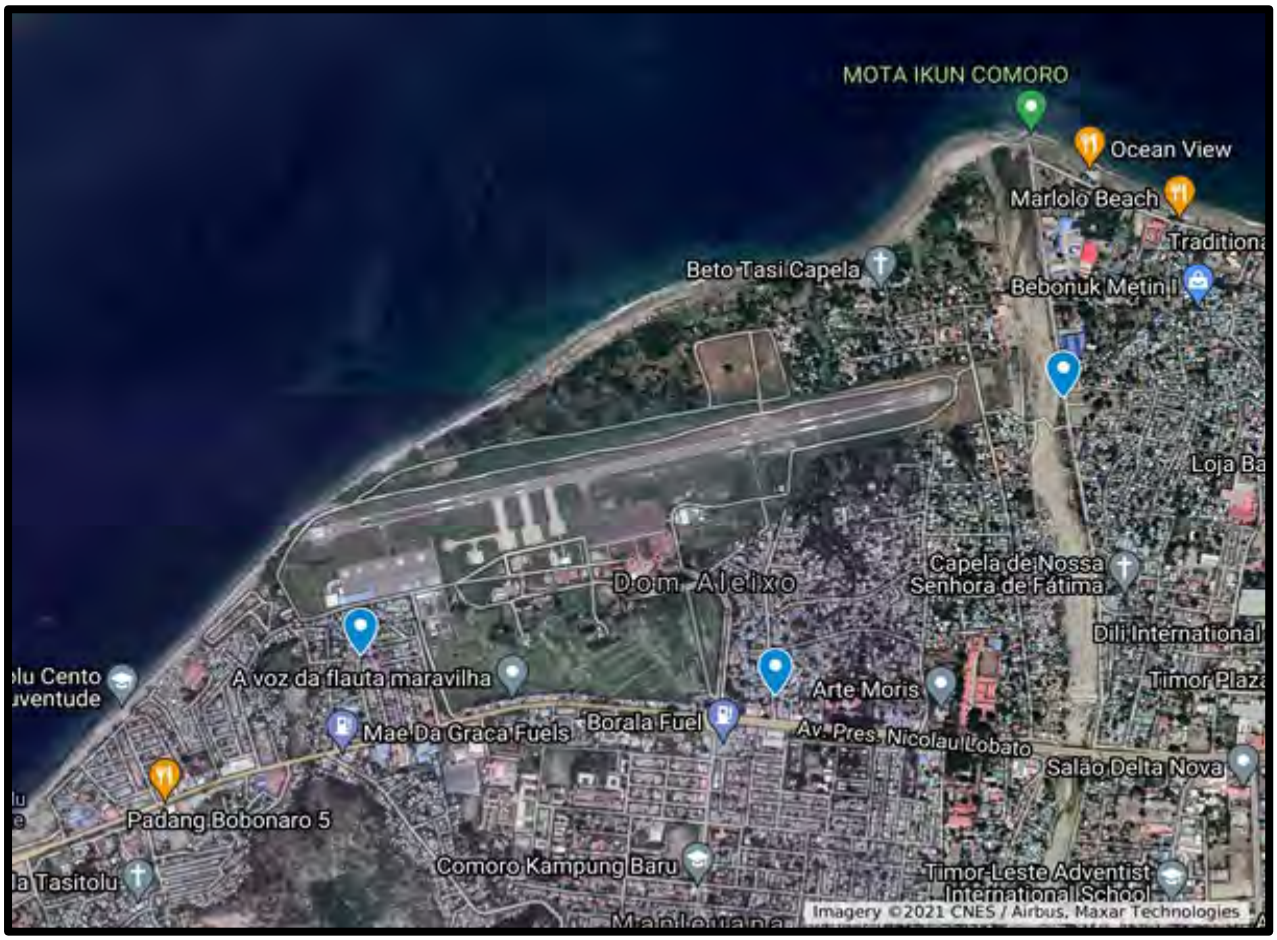


Figure 1.14 Groundwater sample locations (blue marker)

Table 1.20 Groundwater sample locations/coordinates

Sample Name	Longitude	Latitude
GW1	125°31'04.2"E	8°33'05.9"S
GW2	125°31'42.5"E	8°33'09.7"S
GW3	125°32'09.8"E	8°32'40.9"S

Table 1.21 ALS Laboratory Specification

Parameter	ALS Code	Technique/ Method Reference	Limit Of Reporting (LOR)
pH (PCT)	EA005P	APHA 4500-H+ B	0.01 pH Unit
Colour (True)	EA041	APHA 2120 B	0.01 pH Unit, 1 PCU
Turbidity	EA045	APHA 2130 B	0.1 NTU
Suspended Solids - Standard Level	EA025H	APHA 2540 D	5 mg/L
Total Dissolved Solids - Standard Level	EA015H	APHA 2540C	10 mg/L
Dissolved Oxygen (DO)	EP025	APHA 4500-O G	0.1 mg/L
Ammonia as N By Discrete Analyser	EK055G	APHA 4500-NH3 G	0.01 mg/L
Dissolved Mercury	EG035F	APHA 3112- Hg B	0.0001 mg/L
Dissolved Metals by ICP/MS As, Cd, Cu, Pb, Zn	EG020F	USEPA 6020	0.0001 - 0.005 mg/L
Oil & Grease	EP020	APHA 5520 B	5 mg/L

Label Colour	Container Type (Preservation noted if required)	Test Parameter(s)
Green	1 x 500mL Clear Plastic Bottle - Natural	Colour (True), Dissolved Oxygen (DO), Suspended Solids - Standard Level, Total Dissolved Solids - Standard Level, Turbidity, pH
Purple	1 x 250mL Amber Jar - Sulfuric Acid or Sodium Bisulfate	Oil & Grease
Purple	1 x 60mL Clear Plastic Bottle - Sulfuric Acid	Ammonia as N By Discrete Analyser
Red	1 x 60mL Clear Plastic Bottle - Nitric Acid; Filtered	Dissolved Mercury, Dissolved Metals by ICP/MS

1.7.2. Results

Table 1.22 Physical Testing and Bacteriological testing from Local Lab.

Physical Testing & Bacteriological testing					
Groundwater Sample	**Parameter**	**Unit**	**Result**	**WHO/East Timor guideline**	**Testing method**

GW1 – Raikotu (35m depth)	pH Value	-	7.1	6.5-8.5	pH Meter
	Electrical Conductivity	µS/cm	469	NS	Conductivity meter
	TSS	mg/L	0.02	NS	Gravimetry
	TDS	mg/L	234	NS	Gravimetry
	Salinity	‰	0.2	NS	Conductivity meter
	Temperature	°C	28.3	NS	Conductivity meter
	Turbidity	NTU	0.5	5 (NTU)	Turbidity meter
	Total coliform	CFU/100mL	0	0	Membrane filtration
	E.coli	CFU/100mL	0	0	Membrane filtration
GW2 – Beto (15m depth)	pH Value	-	7.6	6.5-8.5	pH Meter
	Electrical Conductivity	µS/cm	521	NS	Conductivity meter
	TSS	mg/L	0.02	NS	Gravimetry
	TDS	mg/L	261	NS	Gravimetry
	Salinity	‰	0.2	NS	Conductivity meter
	Temperature	°C	27.7	NS	Conductivity meter
	Turbidity	NTU	0.4	5 (NTU)	Turbidity meter
	Total coliform	CFU/100mL	0	0	Membrane filtration
	E.coli	CFU/100mL	0	0	Membrane filtration
GW3 – Bebonuk (24m depth)	pH Value	-	7.7	6.5-8.5	pH Meter
	Electrical Conductivity	µS/cm	572	NS	Conductivity meter
	TSS	mg/L	0.02	NS	Gravimetry
	TDS	mg/L	286	NS	Gravimetry
	Salinity	‰	0.3	NS	Conductivity meter
	Temperature	°C	29.6	NS	Conductivity meter
	Turbidity	NTU	0.5	5 (NTU)	Turbidity meter
	Total coliform	CFU/100mL	0	0	Membrane filtration
	E.coli	CFU/100mL	0	0	Membrane filtration

Table 1.23 Groundwater Baseline Analysis by ALS lab.

		GW1	GW2	GW3
		05-Apr-2021 00:00	05-Apr-2021 00:00	05-Apr-2021 00:00
Compound	**Unit**	**Result**	**Result**	**Result**
pH Value	pH Unit	-	-	8,35
Electrical Conductivity@25C	µS/cm	-	-	238
Total Dissolved Solids @180C	mg/L	252	272	572
Salinity	g/kg	-	-	<1
Suspended Solids (SS)	mg/L	8	<5	<5
Colour (True)	PCU	<1	<1	<1
pH Colour	pH Unit	7,59	7,55	7,65
Turbidity	NTU	0,4	<0,1	<0,1
Arsenic	mg/L	<0,001	<0,001	<0,001
Cadmium	mg/L	<0,0001	<0,0001	<0,0001
Copper	mg/L	<0,001	0,002	0,001
Lead	mg/L	<0,001	<0,001	<0,001
Zinc	mg/L	<0,005	0,047	0,065
Mercury	mg/L	<0,0001	<0,0001	<0,0001
Ammonia as N	mg/L	0,02	0,04	0,03
Oil & Grease	mg/L	<5	<5	<5
Dissolved Oxygen	mg/L	9,5	9,5	9,7

Appendix F – Environmental and Social Audit Checklist

Environmental and Social Checklist

Site Location

Question	Yes	No	Remarks
Are there any cultural heritage sites within 100m of the site boundary?	√		It is locasted the coastal of Beto Taci sub villsage
Are there any nationally protected areas within 1km of the site boundary, or within 500m of a protected area buffer zone?	√		*There is Marine Protected Area (MPA) of Taci Tolu located approximately 600m from the PNLIA, however if the PNLIA runway exetended up to 2500 to 3000m it will be affected to the MPA.*
Are there any wetlands within 500m of the site boundary?	√		The wet land of Taci Tolu located approximtely 3km away from the PNLIA
Are there any neighbouring residential properties? If yes, describe their proximity.	√		There are many local community residential (houses) around the airport boundary (fences area) such as communityb of Terrasanta (Rai-Kotu), Beto Taci, Naroman and Anin Fuik sub villages
Are there any schools or hospitals within 200m of the site boundary?	√		There is a private school (São Miguel College) located nearby airport boundary and public primary School, a Chapel and Cemitery at the Beto Taci (marinir)
Is the land proposed for the Project occupied by properties not owned by the company?	√		For current PNLIA is owned by the state, but for gfuture development of PNLIA would efecte to the several land thsat owned by the communty.
Is the site occupied by any other people or businesses?	√		Currently, some site companies occupied by the companies that operate bussiness activity in the airport such as Conophilips.
Is any of the land proposed for the Project farmed?		√	NO

Site Inspection

Question	Answer
Are the site grounds generally free from obvious staining or discoloured soil, concrete or floors?	Yes
Is the site clear of:	
• old equipment?	Yes
• other uncontained debris?	NO
Is the site well organized and maintained in good condition?	NO
Are boundaries and areas surroundings fences in appropriate good environmental conditions	No, the environment around the fence is not good because there are lots of plants and small trees.
Describe the surrounding land uses	To the Northern area is coastal exist of community houses (Beto Taci), to the eastern part is rever and eastsouth of PNLIA boundary also exist community houses of Bedohi village, southern part is terrain that exist nearby communty houses and cemitery, Western

	part a small community houses. More clear information please see the Airport mpa.
Is any information concerning suspected or known soil contamination on site?	NO
Are any portions of the site prone to erosion?	YES, to the sea site.
Are any portions of the site prone to flooding?	*YES, to Southern site cross through Airport terminal (water flow from Comoro road)*
Are there any geological issues at the site, e.g. seismic activity?	Yes, hisyorically there was a seimic activitity occured in 1992 at the Betpo Taci sub villages. It destroyed some pof the communities houses, plants and huge landslide on the beach.
Is there any access to the site by the public?	YES, people using a cross road through runway 26 strip ends from their residence at Kampung Marinir (Beto Taci) to Dili main road.
Are suitable access roads available for the delivery of large loads by heavy goods vehicles?	YES
Is there any high voltage electrical equipment kept at the site, e.g. transformers, substations.	YES, Airport Electrical System Transformer
Are safety signs located around these areas to warn of electrical hazards?	Yes there are some safety sign exists but some does not exists

Air Emissions

Question	Answer
If the site requires official approval for emissions to air are these available and up to date? (In the form of permits, licenses, consents or authorizations). If relevant, are authorized limits and conditions (e.g. monitoring data) being met?	Emission requirement may be applied under Timor Leste Environtal Law through the Secretary of State of Environmental (environmental authority), and National Authoirty For Environmnetal Licensing (ANLA).
Are site processes and operations free of significant fugitive air emissions?	Currently, the PNLIA has not conducted any fugitive air emmiton studies so itr cannot be concluded that PNLIA is free from the significant Air Emmissions.
Are efforts being made to control such emissions?	(AACTL) Authority of Civil Aviation Timor Leste, so far thre is no any enforcement iisued by the PNLIA authority. However, mostly PNLIA authority rely on the the Timor Leste lagal standard of Emvironment (ANLA)
Is the site free of products which could give rise to uncontained dust and fibres (e.g. asbestos)?	Most of the PNLIA current roof buildings are using asbestos and it may possibly contain dust in the area. However, we have not sine any studies to declare it is free from the uncontained dust or not.
What are the main sources of air emissions?	The main source of air pollution possibly comes from combastine engine such as as Generator, Cars, Aircraft engine

Noise

Question	Answer
Is any Noise monitoring undertaken?	NO

Has the site received any noise complaints?	There are no official complaint by any public institutions but sometimes there are some complaints raised by local community who stay surround the airport
Are there any noise mitigation measures used at the site, e.g. barriers?	NO

Water Discharge

Question	Answer
If the site requires official approval to discharge liquid effluent to ground, surface water (including streams, rivers and lakes) or to underground watercourses are these up to date and available for inspection? (Note: may be in the form of a discharge consent, permit or license).	Yes, it may possibly required a license from The State Secretary of Environment and ANLA before discharge any liguide to the ground water, rivers, sea and lakes.
Are all discharges identified and, if required, authorized, licensed or permitted?	Yes
Are all liquid discharges and free water (i.e. rain water pools) free from unusual water conditions such as obvious oily sheen, discoloration? Etc.) ?	Based on our observation that so far rain water free from the any discharge liguides suh as oil, sheen and discoloration
Are spill prevention and control procedures being implemented?	Yes, the PNLIA emergency respond plan are implemented. For instance if there any oil spills it required to isolated or evaquated spill tanker to the safe areas. Than the insident controler will have the instruction to proceed to the safe area.
Is appropriate spill clean-up material and equipment readily available and in an easily accessible location?	Yes, we have fuel spill kiits and easily to reach to the location (Airport Fire Fighting Statoin)
Is all drainage from site well maintained and routed to authorized discharge points?	NO
If the site requires official approval to discharge liquid effluent to sewer or drainage connected into a treatment facility are these up to date and available for inspection? (Note: may be in the form of a discharge consent. permit or license).	Yes, but it is only insidential event, if it is accurs to be impact to the environmental and human health as state on the Law of Environment than it may required a license for discharge any liquied effluent to sewer or draijnage that connected to the facility
If relevant, are discharge monitoring reports available for the last 3 years?	No
If relevant, are authorized limits for discharges being met?	We have not done any
If relevant, are records of discharge samples kept for the last 3 years?	No
Does the site have up to date procedures in place for spill prevention and control?	Yes, It is believed that we have up to date procedures in place for spill prevention and control in Timor Leste.
How close if the nearest surface water course?	It is about 3km from the airport (Taci Tolu lakes)

How close are the nearest ground water wells?	There is none
What are the main sources of effluent discharge?	Normaly water is use only for Toliets, washing hands and some domestic uses inside the airport such as Restaurants and shops who use the water. Possibly , the sources of effluent discharge may comes those pojnts as mentioned

Washing

Question	Answer
Does the organization wash vehicles or equipment onsite?	Yes
If yes what type of parts washer & solvent is used? Where is the washing undertaken?	Use powder, and water to wash cars and clean rubber deposit on the runway
Does the organization wash aircraft?	No, the PNLIA ANATAL does not have Aircraft wash facility but the operator of airline, they have their own washing aircraft facility in the airport
If yes what type of chemical is used and what is the location of aircraft washing?	We do not know
How are used solvents disposed of?	we do not know

Waste

Question	Answer
Does the site have details of where wastes are finally disposed of (including waste contractor and disposer license details)?	In general the Municipality of Dili waste management normally will collect the wastes and to be disposed in Tibar (National Disposed waste area).
Are signed copies of hazardous waste documentation covering waste transfer and disposal available for the last 3 years?	No, all exposed to Tibar
Are copies of data relating to waste composition available for the last 3 years?	No, all exposed to Tibar
Does the site have an inventory of all the waste generated for the last year?	No, all exposed to Tibar
Does the site have a hazardous waste minimization/contingency plan in place and is it up to date?	No
Does the site have a waste minimization/pollution prevention plan in place and is it up- to-date?	No
If the site requires legal authorizations licenses for storing and handling waste, are these up to date?	No
Does the company generate hazardous waste? If yes, what types?	No, company generated hazardous waste in Timor Leste. Mostly send to Tibar
Does the company monitor and document usage, volumes and disposal of any hazardous waste generated?	No

Does the company have (a) specific program(s) to minimize hazardous waste?	No
Are waste management companies audited?	No
Does the company monitor and document trends in non-hazardous waste management (e.g. production, disposal, recycling, reuse) and are there programs in place at your company to minimize non-hazardous waste streams?	No
Does the company monitor and document oil spills, chemical spills, and other accidental releases (e.g. effluent spills?) to all media (land, water, air).	In general ANATL does not have specific document to monitor oil spills, chemical spills and other accidental releases but the companies who operate in the Airport such Fuel Station pertamina and Eto, they have their own standard to control and monitor all liquid spills
Are all waste containers properly labelled with an adequate description of the waste and date of filling?	No
Is hazardous waste collected and stored in properly constructed, undamaged, and closed (except during transfer) containers?	No
Is secondary containment and weather protection provided for hazardous waste containers where necessary?	No
Are only company approved waste haulers/disposal companies being used?	No
Is there evidence of an active program for eliminating, minimizing and/or recycling waste to the extent practicable?	Not in the ANATL, but some companies in Timor who collected specific waste such as cans, plastic bag and botles.

Storage

Question	**Answer**
Are containers storing hazardous materials:	
• In good condition fit for purpose labelled properly?	No
• Are liquid hazardous materials stored as follows:	
• On impervious surface?	No
• With secondary containment (capable of volume of the largest stored container prevailing regulations and guidance)?	No
Are storage areas (particularly fuel storage areas):	
• well maintained;	Yes
• clearly identified with appropriate safety signs;	Yes

• protected from weather as necessary?	Yes
Is a list of tanks available, showing chemical stored, location, condition, date and result of last inspection, date of next test?	No, only fuel station companies has their own tanks
Where required by law, are up to date storage tank registrations available?	For fuels, National Authority of Petrolium and Minerals has relgulations or standards to regulate storage tanks registration
Are all storage tanks in good condition, free of leaks and provided with adequate secondary containment (e.g. bonding) where necessary?	Yes
Is documentation available detailing storage tank leak detection and inventory control practice on site?	No for ANATL but the fuel companies they have details storage tank leak detection
Are tanks clearly marked (e.g. contents, capacity, test marks) in accordance with documentation?	No fo ANATL, but those companies have clearly marked in accordance with the documentation
Is there a list of the hazardous substances on site, plus information on handling, disposal, MSDS etc.	No

Dangerous Goods

What dangerous goods are stored at the site?		
Type	**Volume**	**Storage Area**
Explosives	No	No
Gases	No	No
Flammable Liquids	No	No
Flammable Solids	No	No
Oxidising Agents	No	No
Toxic or infectious substances	No	No
Radioactive material	No	No
Corrosives	No	No
Other		

Emergency Planning

Question	**Answer**
Are emergency actions clearly posted in all areas, with relevant telephone contact numbers?	Yes, it desribed in the Airport Emergency Plan
Is spill clean-up and containment equipment easily available?	Not sure
Is an up-to-date inventory of hazardous chemicals kept on site available?	Yes, under Airport/aerodrome manual
Does the site have a documented plan for dealing with emergencies that may have an environmental significance?	Yes, Airport Emergency Plan (AEP)
Has your company procedures to identify the potential for, and response	Yes, under airport emergency plan

to, environmental incidents, accidents and emergency situations?	
Does your company have procedures to report on environmental incidents, accidents and emergency situations and in terms of implementing corrective actions?	Yes, in airport safety reporting system
If necessary, have the relevant details of this plan been communicated with site neighbours?	Yes, all companies who operate in the airort are part the emergency plan committee

Environmental Management

Question	Answer
Has your company developed a comprehensive framework of policies, practices, procedures, systems and relevant management information to support environmental management? (e.g. ISO 14001)	Not yet,
Is an organized and up-to-date manual or other document present which sets out the following:	
• Site environmental protection policy organisation, responsibilities and procedures.	Not available
• Environmental responsibilities within the company. Are they up-to-date?	Not available
• The extent to which environmental management has been integrated into the overall business management processes of the company?	Not available
Does the Company have an environmental action plan outlining key actions and targets for the current year?	Not available
How does your company collaborate with other Departments or agencies in relation to environmental management?	Not

Legal Issues

Question	Answer
Do your operations require compliance with environmental, health or safety regulations at either the national or state level? For example, site permits, authorizations and notifications	Yes,
Has the Company violated any environmental or social requirements in the previous five years? Have any	NO

environmental or social incidents had a place? Please, provide information on cases related to environmental or social incidents, if any.	
Does the Company use contractors to carry out any of its business activities? If yes – please, list the contractors. How does the Company ensure that its contractors meet the Company's environmental, health safety and labour standards?	Yes; Fabuldus Ltd for Cleaning Service: Airport Terminal and Offices, and TLK Ltd for Grass Cutting at the Airsite and land site. The ANATL issued safety procedures and birefs to the contarctors to ensure safety environment in the airport. In adition, for labour force standard the company will comply with Timor Leste's Labour standard under The Secretary of State of Labour (SEFOPE)
Is there a documented process to:	
• identify the legal and other regulatory requirements associated with environmental impacts of activities, products or services;	No
• provide access to the legal and other regulatory requirements;	No
• evaluate compliance with the legal and other regulatory requirements?	No
How does your company keep track of (changes to) legal and other requirements?	No
How are your environmental objectives established for each relevant business function and level?	No
Has your company established Key Performance Indicators (KPIs) to demonstrate progress against environmental objectives and targets?	No

Management

Question	Answer
Who is responsible for managing environmental issues at the site? Please, provide a job description of this person.	In general, airpot maintanence department and Saniation section is in responsible for environmental issue however only cover the waste and sanition.
Who do they report to in the event of any issues?	Airport Director will report to State Secretary for the Environment and ANLA if there is any necessary issue in regards to the Environment and Emergency Fire Figthers in Timor Leste (Bomberious)

Training

Question	Answer
What is your systematic and documented process to ensure that personnel who carry out tasks that have a significant	ANATL does not have systematic and documention for adequte training program for personnel to carry out tasks that have impact to the environment.

impact on the environment are adequately trained and experienced?	However, for airport safety fire fighters ANATL has stablished specific training policy and programs for the personnel who carry out any impact to the environment (Hazardous wastes, Flammables, dangerous good etc)
Does the training include response to emergencies and drills, and working with external agencies such as fire brigade?	Yes (Fire Fighter Service Personnel)

Communication

Question	Answer
How does your company communicate with key stakeholders in regard to significant environmental aspects and is this process documented?	Normally, any extention or new development of PNLIA, ANATL will organise meeting with environment organization to discuss the issue and documented in the minute of meeting.
How do you identify, monitor, evaluate and understand the needs and expectations of stakeholders?	Comfidential Reporting Form
Does your company have a process to:	
• record and maintain communications between key employees (in your company) responsible for environmental management,	No, we have not done it
• receive, record and respond to communications from interested parties about environmental impacts associated with your company's operations?	No, we have not done it
Does your company seek to protect vulnerable or at-risk groups in communities directly affected by your operations?	No, we have not done yet
Does your company communicate with stakeholders in order to encourage increased participation and understanding in environmental decision making by your company?	No
Does the Company have a person in charge of communications with local communities? If yes - please, provide a job description of a person responsible for communications with local communities.	No, ANATL does not have any specific person to communicate with local community, normaly if there is any case President of ANATL and director will direct have meeting discussion with the community
Is the Company aware of any issues, concerns or positive feedback brought to the Company's attention by members of the community, NGOs or the media? If	No

yes, please, provide the corresponding information.	
Does the Company have a mechanism through which public can raise concerns or grievances in respect of the Company's environmental and social practices? If yes – please, provide information on the mechanism.	No

Audits and Corrective Actions

Question	Answer
Are periodic environmental and safety audits carried out using established programs and procedures?	Environment no, but for Airpot safety normally carry out by internal ANATL safety officer, and Regulatory Inspector (AACTL)
Who completes the audits?	Civil Aviation Authority (AACTL)
Where are the findings reported?	Report ANATL Board and Director of Airport
How are corrective actions managed?	ANATL prepare action plan and implemented
Are your company's environmental audit programs reviewed by an independent organization?	No
Are audits available to the public	No, not done yet
Do documented emergency/contingency plans exist for rectifying significant environmental mishaps?	No
Does your company have procedures to establish and maintain responsibility and authority for handling investigations of non-conformance and taking corrective and preventative action?	No
Is the Company management system compliant with any internationally recognized systems such as ISO 9001?	No

Reporting

Question	Answer
Does your company report to regulators?	Yes,
Does your company produce an annual Environmental Report?	No
Does your company report to the governmental authorities and/or the public on the fulfilment of its environmental responsibilities?	Yes

Social Management

Question	Answer
How many employees work at the facility?	115

How many of the staff are men, and how many are women?	Male 90 and female 25
Are any criteria other than compliance with the job requirements applied when it comes to recruitment, promotion, access to training, benefits (e.g. gender, ethnicity, nationality, citizenship, religion, political or trade union affiliation)?	Yes, the Term of Reference based on the job requirements
Does the Company have an officially approved organizational structure? If yes – please, provide a document with approved organizational structure.	Yes,
Who is responsible for human resources management at the Company? Please provide a job description of a person responsible for human resource management.	Mrs. Monica Rosalia de Aroujo
Please, provide information on the Company grievance/complaint mechanism (if any) which allows employees to raise their concerns?	In general ANATL use government evaluation form from Public Service commission but currently, ANATL new form of evaluation is under developing
Are there medical facilities at the site? If yes describe them, if not describe how emergencies are managed.	Yes, we have Aiport Clinic for emergency response for any passengers having health conditions, woill respomnse directly taken to the National Hospital
Is there an emergency response procedure for the facility	Yes, Emergency Repsonse Plan