

3 Baseline Environment

3.1 Site Description

3.1.1 Site Location

The site earmarked for the development is situated at La Mivoie, Tamarin and it can be accessed from the Black River Road (A3).

The aerial photograph of the site is shown in Figure 3.1.1.1.

3.1.2 Site Ownership

With reference to the Land Surveyor's survey plan in Figure 3.1.2.1, the extent of the Site has been established as 227,391m². This is part of a larger plot of land, 189A93, as indicated on the same plan.

The Project Site belongs to the Company Mont Calme Ltd, as authenticated by the Notary Public Me. Jean Pierre Montocchio, whose certificate is attached in Appendix B.

3.1.3 Site Occupancy

The site was previously used for salt production. All activities pertaining to the manufacture of salt ceased since December 2015.

The part of these salt pans, comprising of small square, shallow basins made of stone masonry, located due north of the development will be preserved and remain as a feature of the previous activities on site. This is morefully explained in the landscaping concept given in Appendix H.

Presently, there are 10 nos. buildings on site which were previously used during the storage of salt.

There are currently two water storage ponds located on the uphill side of the site, which have also been de-commissioned when the salt production was halted.

3.1.4 Site boundaries and neighbouring properties

With reference to Land Surveyor's Plan attached in Appendix F, the Site is bounded by:

- To the north – by surplus of land belonging to Mont Calme Ltd and Black River Road (A3)
- To the east – by Avenue des Vacoas
- To the south – by Avenue des Jacarandas
- To the west – by the existing Domaine de Mont Calme.

The Topography Plan, duly signed by Messrs KDA Geosystems Ltd, Sworn Land Surveyors, is given in Figure 3.1.2.1, in pursuance to Clause 18(1) (c) (ii) of the EPA (2002).



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Bagatelle Office Park
Bagatelle - Mauritius
Tel (230) 601 9800 Fax (230) 468 8338
www.arup.com

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MONT CALME LTD

Job Title

**Residential Development
at La Mivoie, Tamarin**

Drawing Title

AERIAL IMAGE OF THE SITE

Scale at A4
1:5000

Discipline
INFRASTRUCTURE

Job No
240663

Drawing Status
EIA REPORT

Drawing No
FIGURE 3.1.1.1

Issue
P1

Projet de subdivision en 148 lots et 2 espaces verts d'une portion de terrain de contenance de 22.7391ha formant partie d'un terrain de contenance originale de 189A93 située au district de Rivière Noire lieu-dit La Mivoie Tamarin et appartenant à Mont Calme Ltd suivant titre transcrit au Volume T.V. 679 No. 65.

Espace Verts = 12,067 m2 i.e 5.0 %



It can be observed that the Site slopes towards the northwest and that the level slopes from approximately 15m to 3m AMSL.

3.2 Regional Description

3.2.1 Population and Settlements

The resident population distribution in the neighbourhood of the Site, as provided in the Census 2011, is given in Table 3.2.1.1.

Table 3.2.1.1: Resident Population Distribution around Site

Village Council Area	Population ⁴	re Site	Distance from Site
Black River District –Rural	53 448	n/a	n/a
Tamarin VCA	3 766	NW	350m
Grande Riviere Noire VCA	2 668	S	2.5km

3.2.1.1 Sewerage

From the Table 3.2.2.1, it can be inferred that the properties in Tamarin are generally serviced by on-plot septic tanks and absorption pits.

Table 3.2.2.1: Population and types of toilet facilities in the project area⁵

Localities	Population	Flush Toilet connected to		Pit-Latrine	
		Sewerage System	Absorption/Septic Tank	Water Seal	Other
Black River District – Rural	53 448	18	16890	459	545
Tamarin VCA	3 766	-	1513	3	18
Grande Riviere Noire VCA	2 668	-	1013	32	3

3.2.1.2 Solid Waste Disposal

The Ministry of Local Government operates 5 transfer stations at La Brasserie, Poudre d'Or, Roche Bois, La Chaumière and La Laura. The project area is served by the La Chaumière station, from where the waste collected is compacted and sent to Mare Chicose, the only operational landfill in Mauritius, situated in the South of the island, 2.5km from Rose Belle.

3.2.2 Local Amenities

3.2.2.1 Public Beaches

The public beaches along the western coast are located in Figure 3.2.2.1.1. The Tamarin Public Beach is located on the west of the site.

⁴ Central Statistical Office – Digest of Demographic Statistics 2010: August 2011

⁵ The 2011 Housing and Population Census - Central Statistics Office
http://www.gov.mu/portal/goc/cso/census_11.htm



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Client Title

MONT CALME LTD

Bagatelle Office Park
Bagatelle - Mauritius
Tel (230) 601 9800 Fax (230) 468 8338
www.arup.com

Job Title

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La Mivoie, Tamarin

Drawing Title

PUBLIC BEACHES

Scale at A4 1:25 000

Discipline INFRASTRUCTURE

Job No
240663

Drawing Status
EIA REPORT

Drawing No
FIGURE 3.2.2.1.1

Issue
P1

3.2.2.2 Attractions

3.2.2.2.1 Black River Gorges & National Park

Black River Gorges & National Park, the largest protected forest of Mauritius, providing over 50 km of trails, is located at 9km from the proposed residential development.

The National Park spreads over 67 square kilometres and aim at the conservation of the habitat of:

- More than 11 important, endemic, rare and endangered native animals, such as the Mauritian Kestrel, Parrot, Pink Pigeon, etc.
- Over 200 species of very rare and beautiful plants

3.2.2.2.2 Plaine Champagne

Visitors to Plaine Champagne can have:

- A very good idea of the vegetation typical of cooler, rain-fed and wind-beaten high grounds
- Superb panoramic views on the South and West of Mauritius

3.2.2.2.3 Chamarel Coloured Earth

The Chamarel Waterfalls and Coloured Earths are local scenic attractions with their restaurants and visitor's welcome centre.

3.2.2.2.4 Dolphin Watching

Dolphin watching on the western coast of the island has over the years become a major attraction to foreigners and locals alike. Such attraction helps diversify our tourism product and creates opportunities for the local community.

With the proliferation of 'Dolphin Watching Entrepreneurs' providing such services to go on trips and watching dolphins in the lagoon in an uncontrolled and unsafe manner, the authorities came up with the Dolphin Watching Guidelines in a view to safeguard the dolphin population frequenting our waters.

3.2.2.2.5 Casela Nature & Leisure Park

The Casela Nature & Leisure Park is a tourist attraction for both local and foreign visitors. Situated on the edge of a hill, it covers an area of about 14 hectares rich of tropical vegetation. Casela was at first an animal park and zoo and its collections of animals and plants have been constantly enriched with local species and imported ones. The park presently accommodates some 1500 animals comprising of birds, zebras, giant tortoises, monkeys, lions and antelopes among others are shown to the visiting public by means of the Safaris Bus.

The park also offers a range of activities namely ride in the nature, hiking expeditions on foot, mountain bikes and quads on the slopes of the Rempart Mountain, Mountain climbing with professional guides, walk with lions and the

longest zip line circuit in the Indian Ocean. Children are usually fond of the petting farm, the jumping castle or Casela's fishing ponds.

3.2.2.3 Marine & Leisure Activities in Grand Rivière Noire Lagoon

The Grande Rivière Noire lagoon is well known for nautical activities and the following are the main existing facilities:

- Le Morne Anglers Club – Big game fishing and Yacht club. Boat charters departure wharf
- La Carangue Ltd – Located at old Centre de Pêche (part lagoon frontage, part river estuary. Essentially big game fishing and boat charters departure wharf.

The bay itself is used for various activities ranging from line fishing, to water-skiing and sailing.

3.2.3 Industry

Industrial activity in the Black River District is dominated by:

- Cane sugar manufacturing at Médine Sugar Estate, and
- Tourism at Le Morne, Wolmar, Flic-en-Flac

3.2.4 Social Infrastructure

The social infrastructure is concentrated at Grande Riviere Noire, including:

- The St Augustin Catholic Church just opposite side of the A3 Road
- A Primary School
- A Secondary School
- A Post Office
- A Police Station
- A Coast Guard Post
- A Community Health Centre
- A Sports Complex at Tamarin

3.3 Existing built environment

3.3.1 Building and structures

As detailed in Section 3.1.3, the site was previously used for salt production. Part of these salt pans will remain as a feature within the landscaped area due north of the development.

The site also features 10 nos. buildings which were previously used for the storage of salt.

There are currently two water storage ponds located on the uphill side of the site.

3.3.2 Roads and access

The Site is accessed from the Black River Road (A3) which serves the Eastern Tourist Zone and connects to Port-Louis and Bambous.

The road infrastructure, namely the Black River – Port Louis, and the Black River – Quatre Bornes roads, has been upgraded under the Second Highway Project, which concerned the roads in South-West Mauritius.

Connectivity to the centre and east of the island has improved with the implementation of the Beaux Songes Link Road.

3.3.3 Surface water management

The site is located within a catchment area originating from Tourelle du Tamarin and which slopes down towards the coast as shown in Figure 3.3.3.1.

The offsite portion of this catchment features steep slopes and the storm water runoff generated from this part of the catchment is intercepted by the existing road side drain along Avenue des Jacarandas and then drains away from the site.

The storm water runoff generated on-site is captured by the salt pans and eventually flows into a system of drains that run across the site. Those drains then discharge into the existing roadside drain along the Black River (A3) Coastal Road and the storm water is conveyed to the sea through a culvert across the public road.

3.3.4 Electricity supply and distribution

The supply of electricity in Mauritius is the responsibility of the Central Electricity Board (CEB).

Inasmuch as the La Mivoie area is concerned, to cope with the Project and other developments in the southern coastal area, a 66kV line has been laid between Henrietta and Combo via Le Morne.

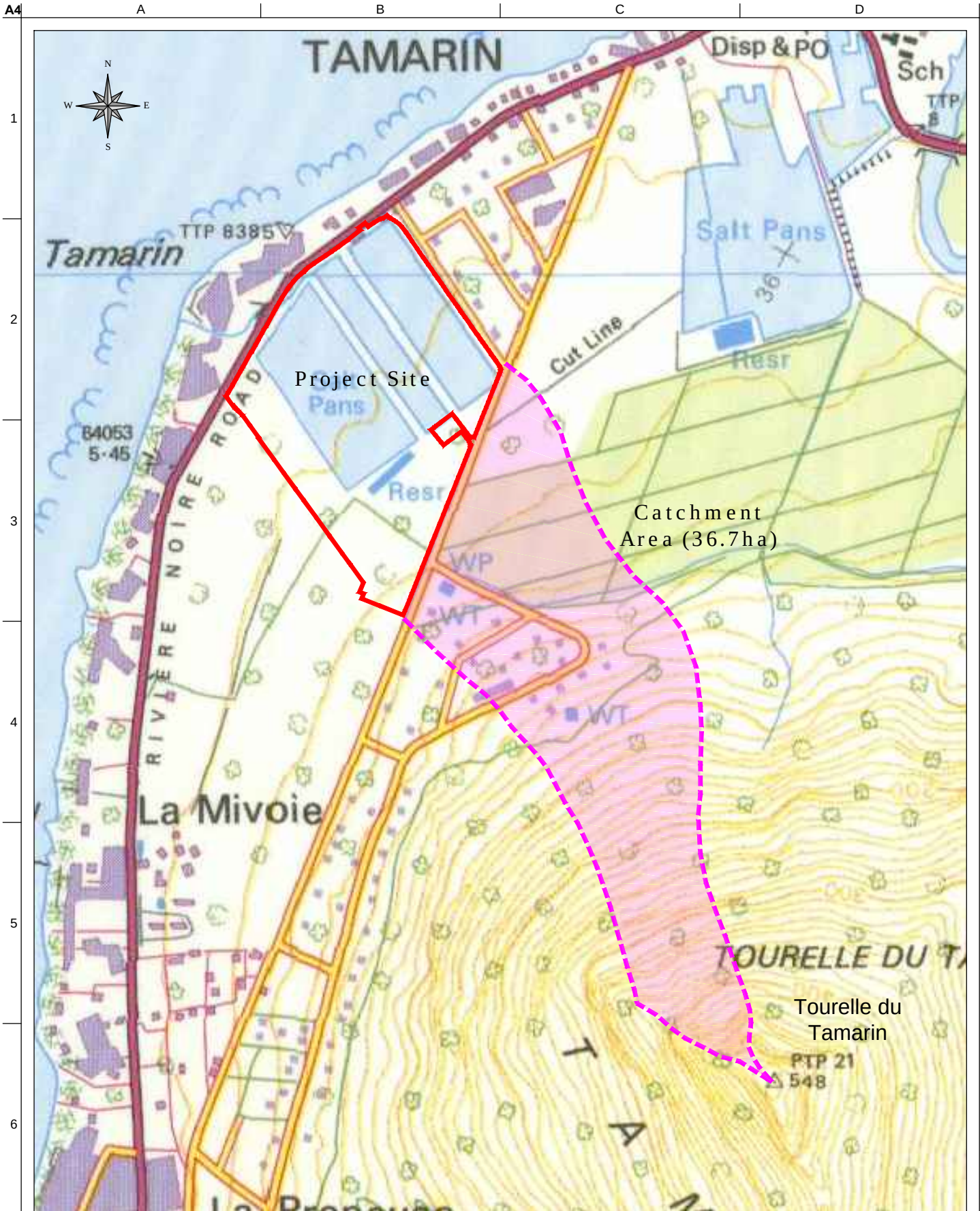
The CEB power transmission and distribution system is detailed in Figure 3.3.4.1 for the whole of Mauritius.

Existing 22kV overhead lines run adjacent to the development along the Black River Road (A3) and the Avenue des Jacarandas. An overhead high tension 22kV line currently crosses the site. This HV power line will be realigned and buried at the boundary of the site or decommissioned.

3.3.5 Potable water supply and distribution

The Tamarin consumer zone forms part of the Mare-aux-Vacoas Water Supply System.

The CWA potable water pipeline runs close along the Black River Road (A3) from the Bois Puant Reservoirs which are themselves fed from the La Marie Station and local aquifer tapping.



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Bagatelle Office Park
Bagatelle - Mauritius
Tel (230) 601 9800 Fax (230) 468 8338
www.arup.com

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Drawing Title

CATCHMENT AREA

Scale at A4
1:10 000

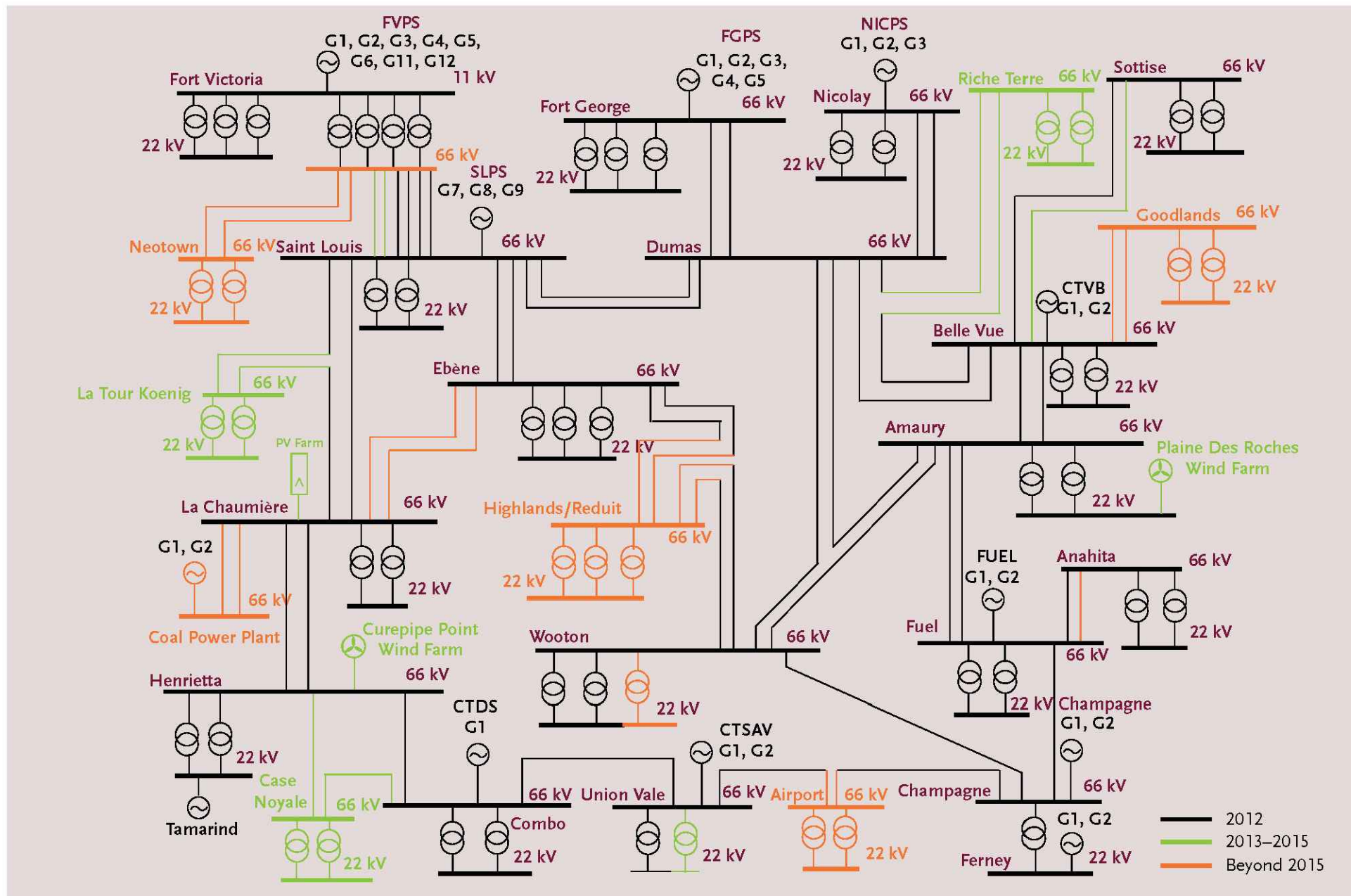
Discipline
INFRASTRUCTURE

Job No
240663

Drawing Status
EIA REPORT

Drawing No
FIGURE 3.3.3.1

Issue
P1



Note: Schematic diagram does not include the next 2 x 50 MW Power Plants, which have been planned for 2017 and 2021, as the siting(s) of the power plants are yet to be determined.

Figure 3.3.4.1. Schematic Diagram of Transmission Network for the Period 2013 - 2022

Source: Integrated Electricity Plan 2013-2022

3.3.6 Telecommunications

A Mauritius Telecom optic fibre communication cable runs along the A3 Rivière Noire road. Connection thereto should a priori pose no major problem as well as its capacity to supply the telecommunication needs of the residential development.

3.4 Existing Terrestrial Environment

3.4.1 Climatic conditions

Mauritius, at latitude 20°S and its modest dimensions (60km NS x 45km EW), is submitted to a tropical ocean climate characterised by two alternating main seasons:

- a hot and rainy season from November to May (southern hemisphere summer).
- a relatively mild, dry season from June to October (southern hemisphere winter).

This climatic regime is heavily biased by the wind regimes and orography, which clearly set out two sharply differentiated zones:

- the windward zone to the south and south-east, well exposed to trade winds.
- The leeward zone to the west, relatively well sheltered from the trade winds.

3.4.1.1 Rainfall

No systematic rainfall gauging exists for the Site and it may therefore be appropriate to use data recorded at Petite Rivière Noire at +3m reMSL:

**Table 3.4.1.1.1: Mean rainfall recorded at Petite Rivière Noire (1951-1980)
(The Climate of Mauritius, B.M.PADYA, 1984)**

MONTH	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
MEAN mm	180	174	152	97	58	43	35	25	18	20	41	139	982

The above rainfall data must be completed by extreme or cyclonic rainfall data⁶ which allow an assessment of maximum rainfall intensity expectable on the Island.

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⁶ B. M. PADYA: Climate of Mauritius. 1984.

⁷ B. M. PADYA: Climate of Mauritius. 1984.

Table 3.4.1.1.2: Extreme Rainfall Intensities

PERIOD of RECORD	PRECIPITATION Height (mm)
5 min	15
15 min	30
35 min	61
01 hr	82
02 hr	115
03 hr	150
04 hr	180
12 hr	250
24 hr	490

3.4.1.2 Site Wind Regimes

3.4.1.2.1 Trade Winds

The site is situated on the south-western coast of Mauritius and as such it is sheltered by mountains to the east of the site from the dominant easterly to south-easterly winds ranging from 2 to 30 km/h over about 30 to 40% of the time.

The trade winds range typically between 7.5 to 30km/h, with occasional peaks at 40km/h reached at 12h00, particularly during the winter season. The wind speeds fall considerably between 18h00 and 22h00 and remain low during the night, to reinforce again at about 8h00.

3.4.1.2.2 Sea breezes

The site can be under the influence of westerly sea breezes generated by convection effects that are themselves induced by intense solar heating of the island. On the western coast, sea breezes from the West can completely mask the Trade Winds, especially during the summer. These occurrences are relatively low usually less than 50% of time.

3.4.1.2.3 Cyclonic Winds

Mauritius is located within the cyclone belt of the south-west Indian Ocean. On average, about 10 cyclone formations occur during the tropical cyclone season of which two or three are classified as intense cyclones. The percentage of occurrence of observed cyclones⁸ are given in Table 3.4.1.2.3.1; the Return Period for hourly winds and peak gusts⁹ are given hereunder in Table 3.4.1.2.3.2.

Table 3.4.1.2.3.1: Monthly % Occurrences of Observed Cyclones (1960-1983)

	DEC	JAN	FEB	MAR	APR	MAY	TOTAL
% Occurrence	18.1	20.8	30.6	18.1	9.7	2.8	100

⁸ B. M. **PADYA**: Climate of Mauritius. 1984.

⁹ B. M. **PADYA**: Climate of Mauritius. 1984.

Table 3.4.1.2.3.2: Statistical Distribution of Wind Velocities for Cyclones observed at Pamplémousses (1960-1983)

RETURN PERIOD (years)	100	50	15	5
HOURLY WINDS (km/h)	125	112	90	72
PEAK GUSTS (km/h)	230	200	160	130

3.4.1.3 Site Wind Data

Since no wind measurements are carried out on site, those made at Médine S. E. on behalf of the Meteorological Services will be adopted as representative of the site wind conditions. The wind roses corresponding to these measurements are centred on the project site overlaid on the 1:25 000 Regional Ordinance Survey Map of Mauritius, as shown in Appendix E.

3.4.1.4 Site Temperature

Daily temperature measurements¹⁰ are made at Médine S. E. Monthly maximum, minimum and average temperatures are given in Table 3.4.1.4.1

Table 3.4.1.4.1: Maximum, Minimum and Average Temperature (°C) at Médine S.E (1960-1983)

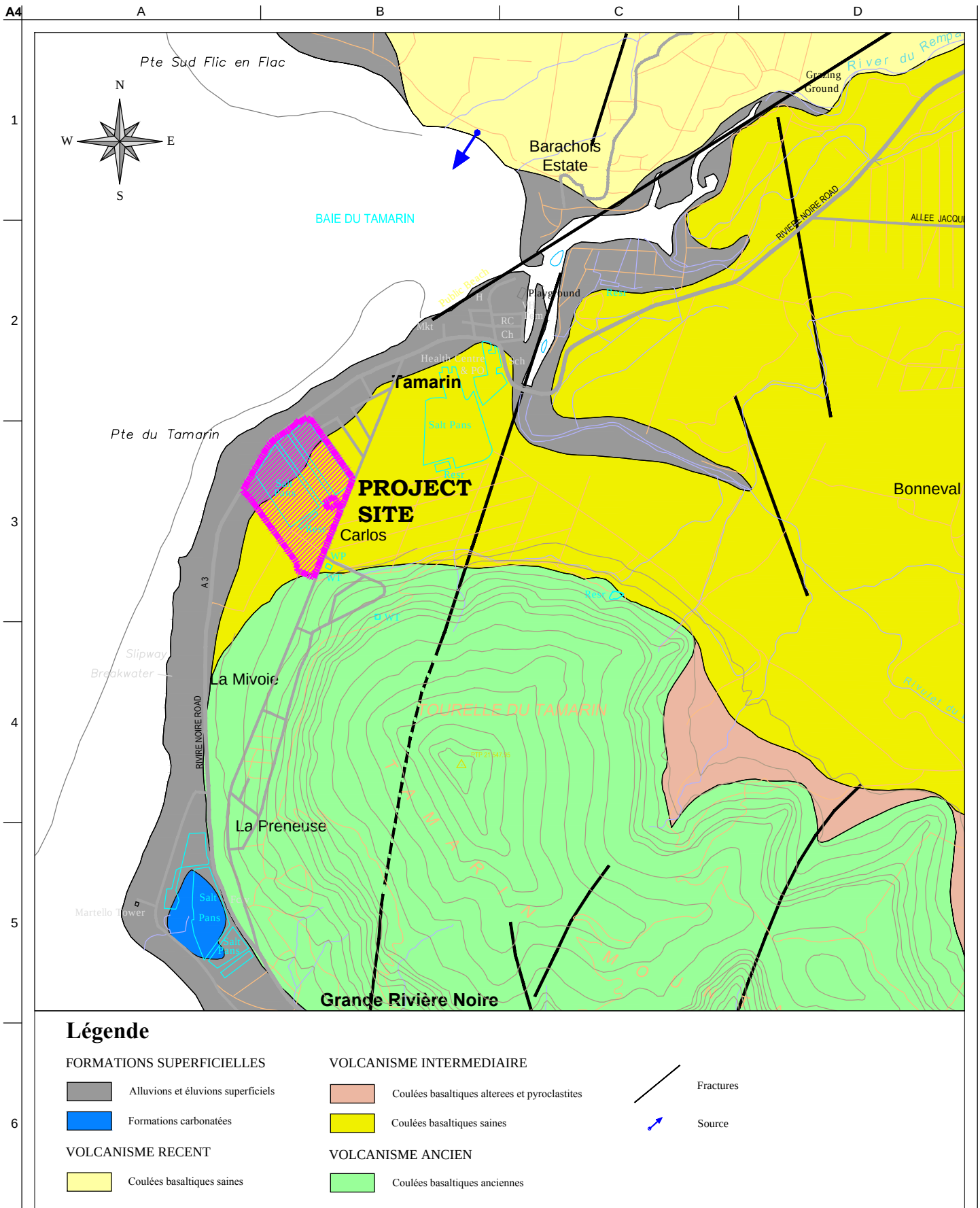
MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
Maxima Tx	31.1	31.2	30.8	30.0	28.5	26.4	25.8	25.6	26.6	27.8	29.5	30.5	
Minima Tn	22.8	22.5	22.3	20.9	19.1	17.4	16.9	17.1	17.1	18.0	19.8	21.3	
$\frac{1}{2} \{Tx+Tn\}$	26.9	26.9	26.5	25.5	23.8	21.9	21.3	21.3	21.9	22.9	24.7	25.9	24.1

3.4.2 Geology and Pedology

Soil characteristics are an important parameter in the construction of infrastructure and drainage of a site. For the purpose of describing the soil profile and determining the percolation rates, three trial pits have been dug to a depth of at least 3m and inspected. The location of the pits are shown in Figure 3.4.2.1.

From the geotechnical report attached in Appendix D, based on the soil stratigraphy, it has been observed that the site lies on the fresh basalt of the Intermediate Lava Series. The intermediate volcanic series are composed of basaltic flows overlying basalt agglomerate. The basalts are not very homogenous in composition but, on the whole, they are made up of fine grained olivine rocks, grey to black in colour. The very compact types are rather rare, and are in general porous and often vesicular, the vesicles being sometimes infilled with a powdery bluish material. They are also slightly fissured and in some places the fissures and cavities are filled with light cream coloured clay.

¹⁰ B. M. PADYA: Climate of Mauritius. 1984.



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MONT CALME LTD

Bagatelle Office Park
Bagatelle - Mauritius
Tel (230) 601 9800 Fax (230) 468 8338
www.arup.com

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Drawing Title

GEOLOGICAL MAP

Scale at A4
1:25 000

Discipline
INFRASTRUCTURE

Job No
240663

Drawing Status
EIA REPORT

Drawing No
FIGURE 3.4.2.2

Issue
P1

According to the Geological and Pedological map shown in Figure 3.4.2.2 and Figure 3.4.2.3 respectively, the natural strata on the site area consists of stony Dark Magnesium Clay. This extremely plastic clay formation develops under low rainfall conditions (less than 1500mm) and shows the dominant influence of montmorillonitic clay, together with a high degree of saturation by magnesium.

3.4.2.1 Infiltration Rates and Soil Water-holding Capacity

The quantification of the infiltration rates, characteristics of the type of soil encountered, is necessary, as they have to be taken into consideration when prescribing the disposal of the septic tank supernatants by means of a leaching field.

As part of the soil investigation study, three percolation tests were conducted to determine the ground's rate of water infiltration. The test was performed on hand-excavated pits in colluvium and machine excavated pits in the rocks, in accordance to British Standards BS 6297:2007.

Table 3.4.2.1.1 shows the percolation value, Vp of the three trial pits.

Table 3.4.21.1: Percolation Rates at Mont Calme Development

Trial Pit No.	Percolation Test Depth (m)	Stratum	Average Percolation Rate (Vp s/mm)	Soil Permeability, K (mm/hr)
TP 1	2.10	Slightly weathered basalt with seams of clay	>100	<36
TP 2	2.20	Moderately weathered basalt	<15	>240
TP 3	2.00	Colluvium – stiff to very stiff clay	>100	<36

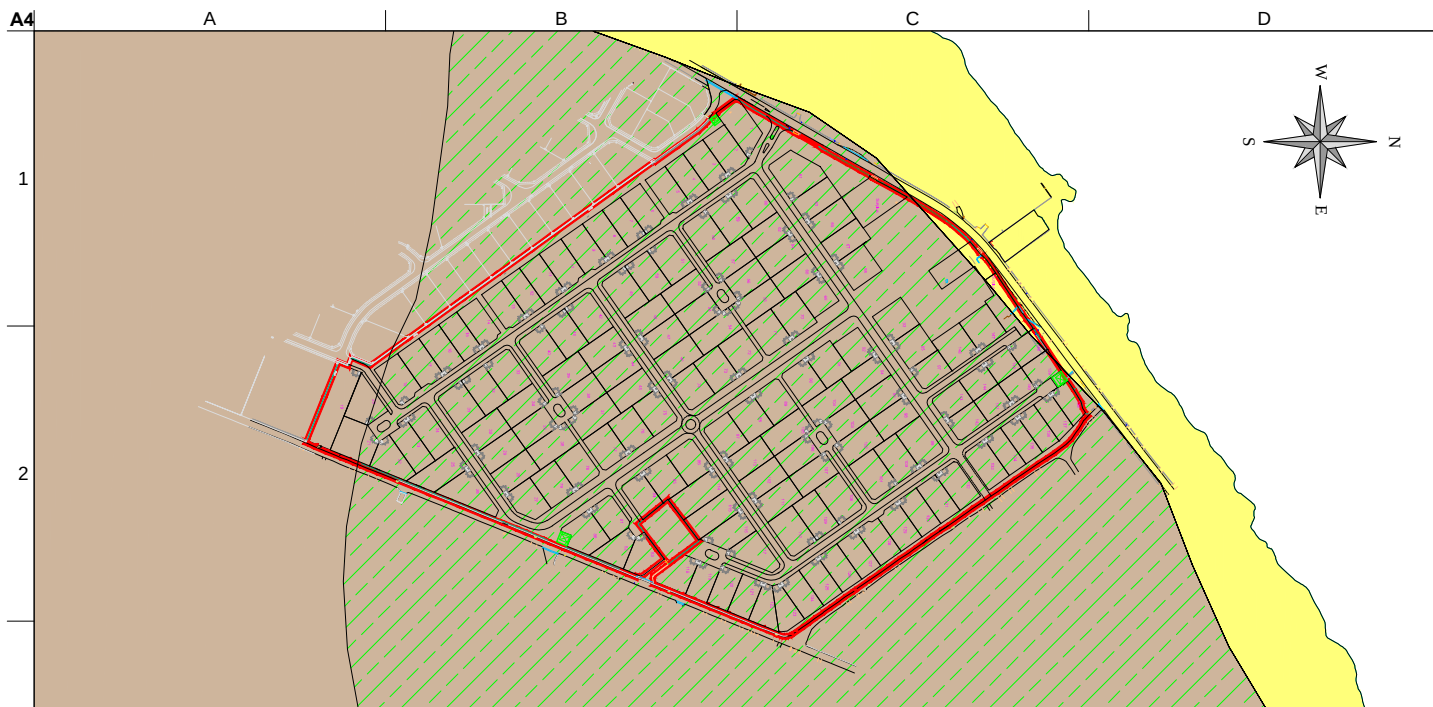
The soil permeability values K obtained at Trial Pits TP1 and TP3 was less than 36 mm/hr and the K value at TP2, lying under moderately weathered basalt, was greater than 240 mm/hr which was considered as outlier. The permeability values are classified as good¹¹ and require an effluent application rate, to the ground, at 30 l/m²/d.

Based on the results obtained, the use of individual septic tank together with standard leaching field is not recommended. The leaching field should be reconstituted and the relevant detail is given in Figure 4.9.1.

3.4.3 Noise

The Project Site is a naturally calm site and the ambient noise levels in the vicinity of the site are considered to be low. The only significant source of noise is from vehicles using the Black River Road (A3) and from the neighbouring salt production activities.

¹¹ Planning Policy Guidance 2004- Technical Sheets – DESIGN GUIDANCE On-Site Wastewater Disposal



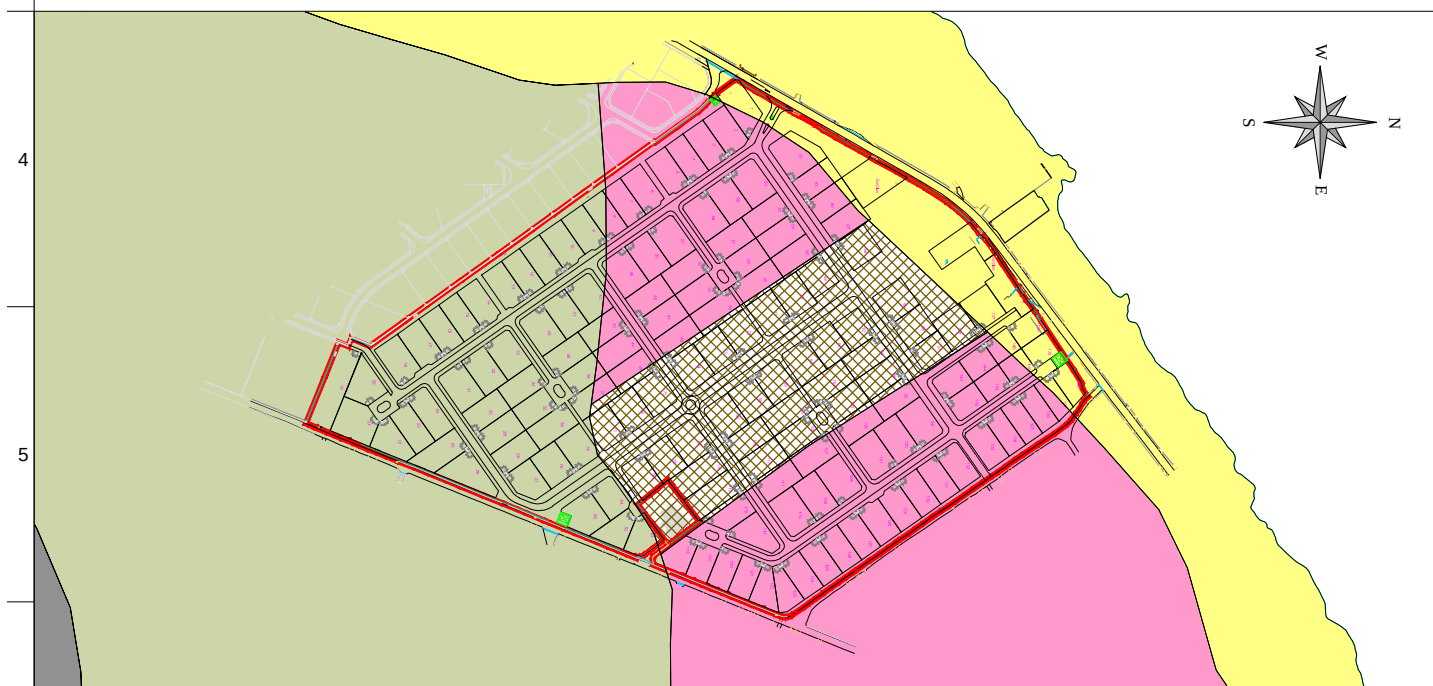
Soil Groups

- Dark Magnesium Clay
- Regosols

Special Phases

- Stony

HAWAIIAN CLASSIFICATION



Legende

- Sols sableux, très calcaire (sables coralliens - pH: 8 à 9)
- Sols de profondeur généralement faible, très pierreux, gris foncé, plus ou moins tachetés, riche en argiles gonflantes, quelques nodules en profondeur, quelques concrétions.
- Association de sols lithiques et de sols de profondeur variable, riches en éléments grossiers, gris-brun foncé, à structure large avec "slickensides", non tachetés, à réaction neutre.

- Marais salant

ORSTOM CLASSIFICATION

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MONT CALME LTD

Bagatelle Office Park
Bagatelle - Mauritius
Tel (230) 601 9800 Fax (230) 468 8338
www.arup.com

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La Mivoie, Tamarin**

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PEDOLOGICAL MAP

Scale at A4
1:7500

Discipline
INFRASTRUCTURE

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240663

Drawing Status
EIA REPORT

Drawing No
FIGURE 3.4.2.3

Issue
P1

The instantaneous noise levels were measured at the locations shown in Figure 3.4.3.1.

The noise field thus obtained is described in Table 3.4.3.1.

Table 3.4.3.1: Noise Level Distribution around Project Site

Locations	1	2	3	4	5	6
dBA	68.5	68.7	61.3	43.6	43.3	49.1
Time	13h37	13h35	13h40	13h25	13h20	13h30

3.4.4 Flora and Fauna

The site was formerly used for salt production with no trees or zones of natural vegetation. Consequently the site in its current use does not provide a variety of habitats and is considered to have very low biodiversity.

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Aerial Image Source: GOOGLE Earth Pro 13.09.2015

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Bagatelle Office Park
Bagatelle - Mauritius
Tel (230) 601 9800 Fax (230) 468 8338
www.arup.com

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**Residential
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La Mivoie, Tamarin**

Drawing Title

**LOCATION OF NOISE
MEASUREMENT STATIONS**

Scale at A4
1:5 000

Discipline
INFRASTRUCTURE

Job No
240663

Drawing Status
EIA REPORT

Drawing No
FIGURE 3.4.3.1

Issue
P1