Narok OR19-14 Test Site – Atmospheric Corrosivity

Site OR19-14

Narok Test Site (Image by Geosun).

Background:

Narok Town is in the southern part of the Great Rift Valley in Kenia [1], with an elevation of roughly 1 827 m above sea level [2]. The town is the primary urban area in the county, with more than 40 000 inhabitants that rely on farming, tourism, and mining activities as primary sources of income [2].

The site is about 125 km west of Nairobi and approximately 185 km east of Lake Victoria. The area's atmosphere is warm and temperate [3], with a yearly average temperature of 18.1 ± 1.3ºC - fluctuating between 14.2ºC and 22.6ºC. The mean yearly humidity level is 86.2 ± 10.8%, and the annual precipitation level is near 785 mm. The rainfall months are November to May, with February being the warmest time of the year [3]. The dry season is from June to October, and the average wind speed is 3.8 ± 1.3 m/s, mainly in a south-easterly direction. Per the Köppen-Geiger system, the environment is classified as Cfb [4].

The corrosivity of the atmosphere is Low (C2) per the ISO 9223 classification system, exhibiting temperate conditions and low levels of pollution.

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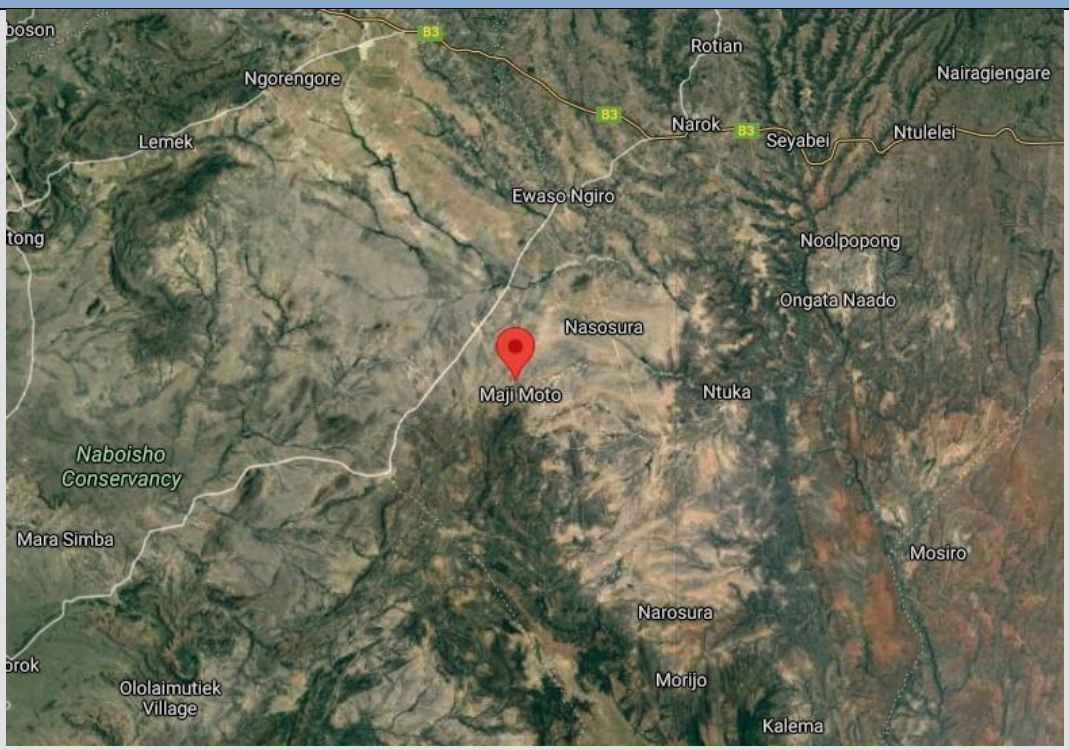

Google Inc Map of Narok County [5].

GPS Coordinates of Site:	1°19'15.6"S 35°42'36.0"E	**Elevation above Sea Level (m):**	1 946 m	**Distance from Ocean (km):**	~525 km

ISO 9226 Corrosion Rates and ISO 9223 Corrosivity Classification	
R_{CORR} Mild steel (µm/yr)	6.37 ± 0.43 µm/yr (1st year) and 5.96 ± 0.09 µm/yr (2nd year)
R_{CORR} Aluminium (µm/yr)	<0.1 µm/yr (Negligible) (1st and 2nd year)
R_{CORR} Hot Dip Galvanised Steel (µm/yr)	0.54 ± 0.02 µm/yr (1st year) and 0.30 ± 0.01 µm/yr (2nd year)
R_{CORR} Copper (µm/yr)	0.44 ± 0.02 µm/yr (1st year) and 0.49 ± 0.03 µm/yr (2nd year)
ISO 9223 Corrosivity Classification	Low (C2) – Temperate/rural atmospheric environment with low pollution
Typical surface contaminants	Pollution - mainly aluminium- and phosphate-based Specific contaminants include: Water-soluble salts – 8 mg/m^2 Chlorides – Not detected pH – Neutral

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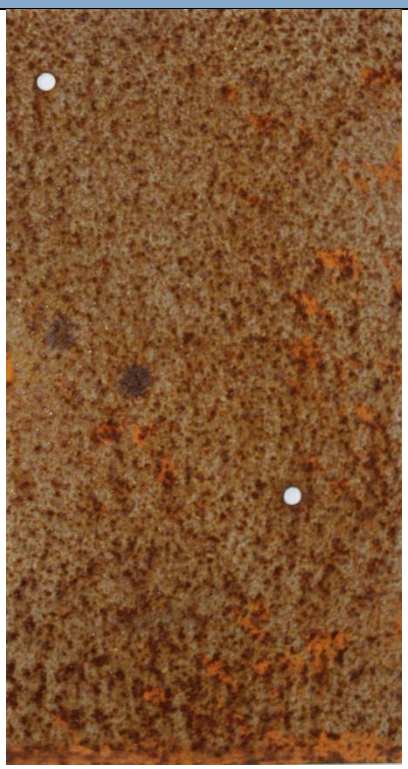
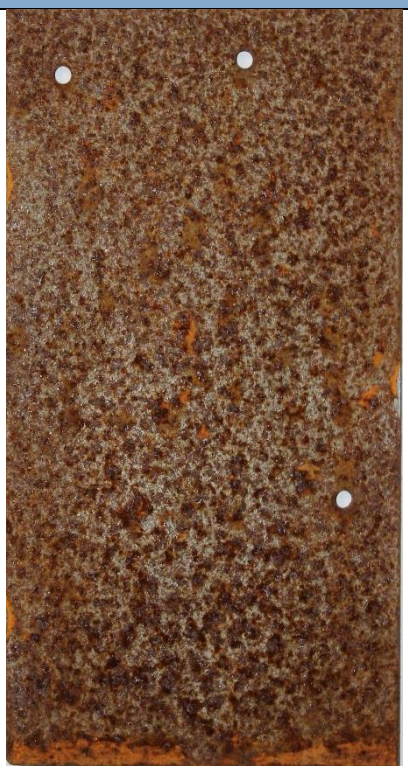
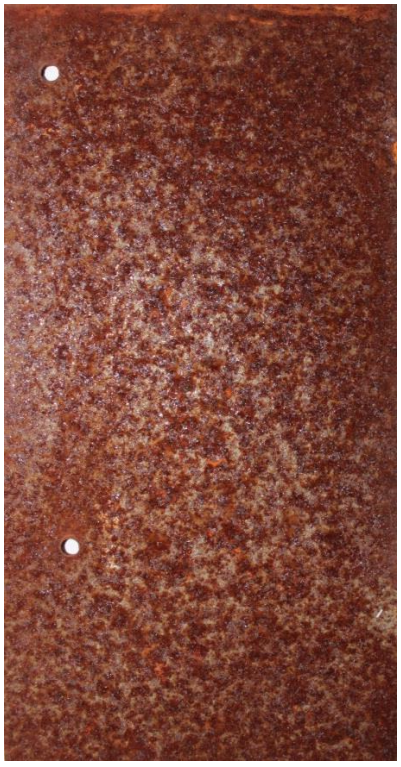


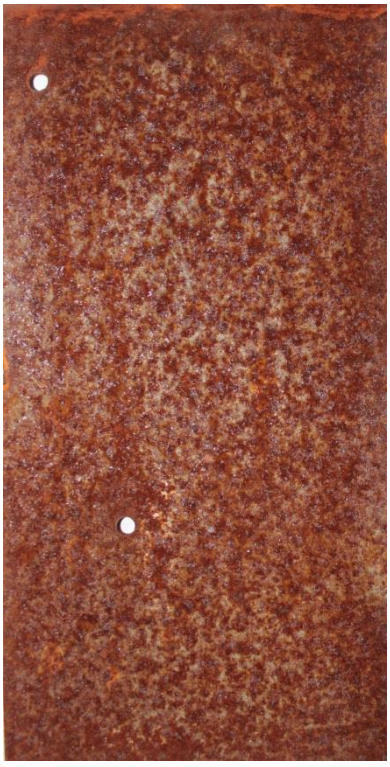
Mild steel – 12 months



Mild steel – 12 months



Mild steel – 24 months



Mild steel – 24 months

Narok OR19-14 Test Site – Atmospheric Corrosivity

Aluminium – 12 months

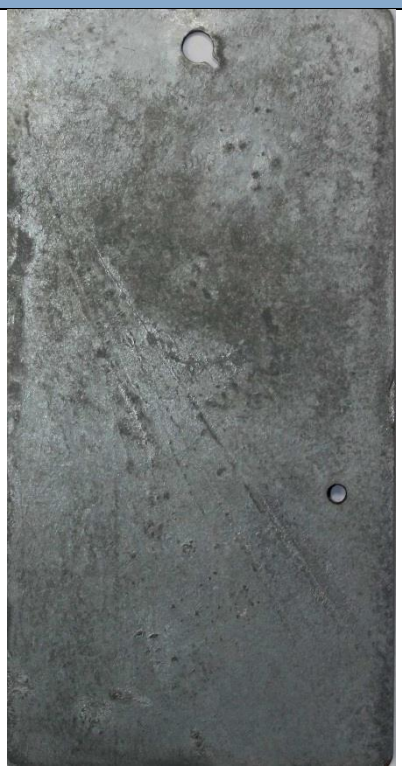
Aluminium – 12 months

Aluminium – 24 months

Aluminium – 24 months

Narok OR19-14 Test Site – Atmospheric Corrosivity

HDG – 12 months



HDG – 12 months

HDG – 24 months

HDG – 24 months

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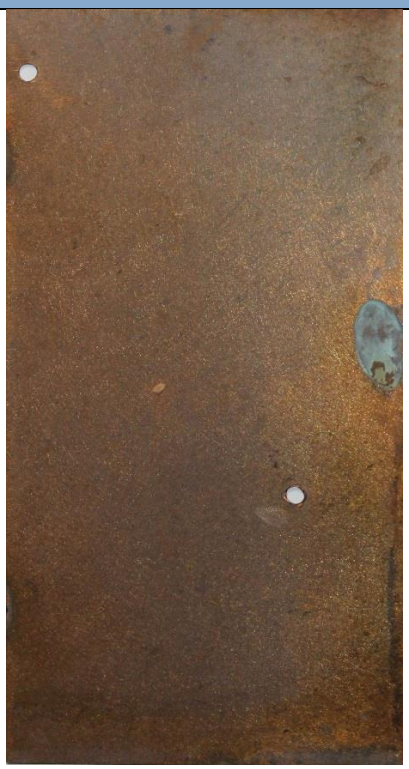
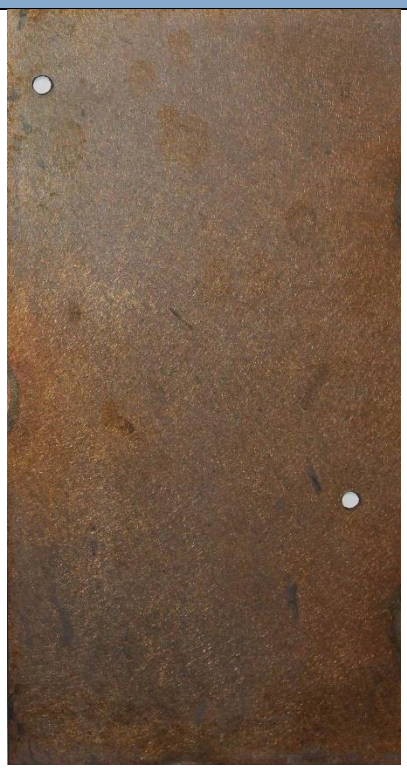
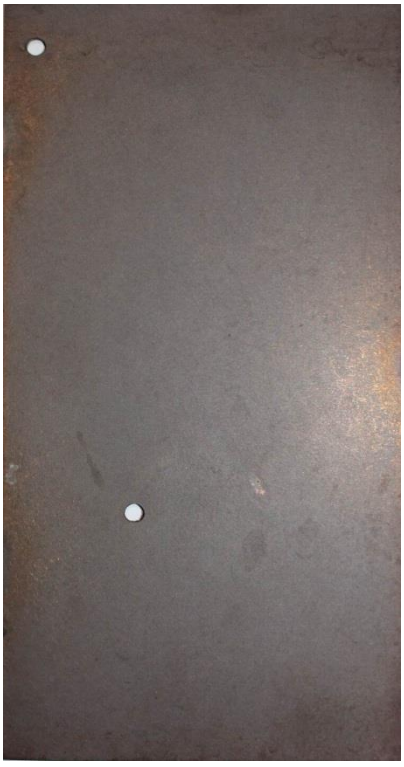


Copper – 12 months



Copper – 12 months

Copper – 24 months



Copper – 24 months

Works Cited

[1] Wikipedia, "Narok County," 7 April 2021. [Online]. Available: https://en.wikipedia.org/wiki/Narok_County. [Accessed 28 April 2021].

[2] Wikipedia, "Narok," 28 April 2021. [Online]. Available: https://en.wikipedia.org/wiki/Narok.

[3] Climate-Data.Org, "Narok Climate - Kenia," 28 April 2021. [Online]. Available: https://en.climate-data.org/africa/kenya/narok/narok-11128/. [Accessed 28 April 2021].

[4] Wikipedia, "Köppen climate classification," Wikipedia, 28 April 2021. [Online]. Available: https://en.wikipedia.org/wiki/K%C3%B6ppen_climate_classification. [Accessed 28 April 2021].

[5] Google Inc, "Google Maps," 28 April 2021. [Online]. Available: https://www.google.com/maps/place/1%C2%B019'15.6%22S+35%C2%B042'36.0%22E/@-1.3201849,35.5497617,134496m/data=!3m1!1e3!4m5!3m4!1s0x0:0x0!8m2!3d-1.321!4d35.71. [Accessed 28 April 2021].