GENERAL **N**OTICES
ALGEMENE **K**ENNISGEWINGS

NOTICE 1099 0F 2013

DEPARTMENT OF AGRICULTURE, FORESTRY AND FISHERIES (DAFF)

PUBLICATION OF THE FIRE DANGER RATING SYSTEM FOR GENERAL INFORMATION IN TERMS OF SECTION 9(1) ON THE NATIONAL VELD AND FOREST FIRE ACT, 1998 (ACT NO. 101 OF 1998)

I **Avhashoni Renny Madula**, in my capacity of as Director: Forestry Regulation and Oversight, acting in terms of section 9(1) of the National Veld and Forest Fire Act, 1998 (Act no. 101 of 1998) read with the delegations of powers and duties made in terms of this Act, hereby on behalf of the Minister of Agriculture, Forestry and Fisheries make and publish for general information the South African National Fire Danger Rating System, as set out in the Schedule hereto. This notice, replaces notice 1054 of 2005 which was published in government gazette No. 27735.

For more information, please follow the following instructions:

- Step 1: Open the DAFF website, www.daff.gov.za
- Step 2: Click on legislation
- Step 3: Click on Acts
- Step 3: Click on National Fire Danger Rating System

Avhashoni Renny Madula

DIRECTOR: FORESTRY REGULATION AND OVERSIGHT

Date:

SCHEDULE

1. Introduction

Fire Danger Rating System is the system that is used to provide a measure of the relative seriousness of burning conditions and threat of fire by providing an accurate measure as possible of the relative seriousness of burning conditions. The system also serves as an aid to fire control programs. It process and evaluates factors influencing fire danger systematically and represent them in the form of fire indices. The National Veld and Forest Fire Act (Act No. 101 of 1998) obliges the Minister to set up and maintain the system. However, he or she may delegate his or her powers and duties to do so to an organization with the necessary expertise. Through the system, a prohibition on the lighting of fires in the open air comes into force when the Minister warns in the media that fire danger rating is high and/or extreme-high.

To that extent, the National Fire Danger Rating, which is based on the Lowveld Model, has been approved as the official South African Veldfire Danger Rating system to fulfill this mandate.

2. Lowveld Based Model

The model makes calculations of the fire danger and indicate the value calculated daily, using dry bulb and dew point temperature to calculate first the relative humidity and then a Burning Index.

The Burning Index is adjusted according to prevailing wind by speed, while the availability of excess moisture (above the plant fibre saturation point) provided by recent rainfall, is taken into account by multiplying the burning index by rainfall correction factor. The Burning Index, corrected for wind and rainfall, is known as Fire Hazard Index by a rainfall correction factor. The Burning Index states that the Fire Hazard Index is usually calculated at about midday, when it is to at its maximum and therefore most dangerous stage.

3. Initial Fire Danger Indices (FDI)

It is a quantitative indicator of one or more facet of fire danger expressed in an absolute measure. These are:

- Temperature (T = Maximum, expressed in degrees C)
- Relative humidity (RH = Minimum, expressed in percentage %)
- Wind speed (correction factor) and
- Rain (correction factor).

The initial FDI, based on Temperature and RH will be calculated using the following formula:

- FDI = {(T-35) - ((35-T)/30) + ((100-RH)*0.37) + 30}
- T: Temperature, Degrees C
- RH: Relative humidity (%)

4. Calculating the wind correction factor:

Wind speed (km/h)	Add to initial FDI value
0-2	+ nil
3-8	+05
9-16	+10
17-25	+15
26-32	+20
33-36	+25
37-41	+30
42-45	+35
46+	+40

5. Calculating the rain correction factor:

This takes into account the amount of rainfall that has been received in a particular area and the number of days since that rainfall. The value is then multiplied by the FDI value.

	Days since rainfall											
Rain mm	**1**	**2**	**3**	**4**	**5**	**6**	**7-8**	**9-10**	**11-12**	**13-15**	**16-20**	**21+**
0.1 - 2.6	0.7	0.9	1	1	1	1	1	1	1	1	1	1
2.7 - 5.2	0.6	0.8	0.9	1	1	1	1	1	1	1	1	1
5.3 - 7.6	0.5	0.7	0.9	0.9	1	1	1	1	1	1	1	1
7.7 - 10.2	0.4	0.6	0.8	0.9	0.9	1	1	1	1	1	1	1
10.3 - 12.8	0.4	0.6	0.7	0.8	0.9	0.9	1	1	1	1	1	1
12.9 - 15.3	0.3	0.5	0.7	0.8	0.8	0.9	1	1	1	1	1	1
15.4 - 20.5	0.2	0.5	0.6	0.7	0.8	0.8	0.9	1	1	1	1	1
20.6 - 25.5	0.2	0.4	0.5	0.7	0.7	0.8	0.9	1	1	1	1	1
25.6 - 38.4	0.1	0.3	0.4	0.6	0.6	0.7	0.8	0.9	1	1	1	1
38.5 - 51.1	0.1	0.2	0.4	0.5	0.5	0.6	0.7	0.8	0.9	1	1	1
51.2 - 63.8	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.7	0.8	0.9	1	1
63.9 - 76.5	0.1	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.8	0.9	1
76.6+	0.1	0.1	0.1	0.2	0.4	0.5	0.6	0.6	0.7	0.8	0.9	1

6. Official colors of the model

The model has five official colors. Namely: blue, green, yellow, orange and red. These colors rate the level and categories of the likelihood of fires occurring in a given area.

Alert Stages/ Colour codes	**FDI**	**Fire Danger**	**Ratings**
BLUE	0-20	Low	Insignificant
GREEN	21-45	Moderate	Low
YELLOW	46-60	Dangerous	Medium
ORANGE	61-75	Very dangerous	High
RED	76-100	Extremely dangerous	Extremely high

7. How the system will link with fire behavior and suppression measures

The behavior of fire could change from one form to the other depending on the prevailing meteorological conditions. Suppression measures and resources must be aligned accordingly. In the table below, the following are recommended.

INDICATIVE COLOUR	BLUE	GREEN	YELLOW	ORANGE	RED
FIRE BEHAVIOUR	Fires are not likely to ignite. If they do, they are likely to go out without suppression action. There is little flaming combustion. Flame lengths in grassland and plantation forest litter lower than 0.5m and rates of forward spread less than 0.15 kilometres per hour.	Fires likely to ignite readily but spread slowly. Flame lengths in grassland and plantation forest litter lower than 1.0m and rates of forward spread between 0.3 and 1.5 kilometres per hour.	Fires ignited readily and spread rapidly, burning in the surface layers below trees. Flame lengths in grasslands and plantation forests between 1 and 2m, and rates 0.3 and 1.5 kilometres per hour.	Fires ignited readily and spread very rapidly, with local crowning and short-range spotting. Flame lengths between 2 and 5m, and rates of forward spread between 1.5 and 2.0 kilometres per hour.	Conflations are likely in plantation forests, stands of alien invasive trees and shrubs, sugar cane plantations, and fynbos. Long range fire spotting is likely in these fuel types. Rates of forward spread of head fires can exceed 4.0 kilometres per hour and flame lengths will be in order of 5-15m or more.
FIRE SUPPRESSION DIFFICULTY	Direct attack feasible: one or a few field crew with basic fire fighting tools easily suppresses any fire that may occur.	Direct attack feasible: fires safely approached on foot. Suppression is readily achieved by direct manual attack methods.	Direct attack constrained: fires not safe to approach on foot for more than very short periods. Best forms of control should combine water tankers and back burning from fire control lines.	Direct attack not feasible: fires cannot be approached at all and back burning, combined with aerial support are the only effective means to combat fires. Equipment such as water tankers should concentrate efforts on the protection of houses.	Any form of fire control is likely to be precluded until the weather changes. Back burning dangerous and best avoided.

8. Recommended actions for various ratings

INDICATIVE COLOUR	BLUE	GREEN	YELLOW	ORANGE	RED
DANGER RATING	Insignificant	Low	Moderate	High	High-Extreme
FIRE PREVETION AND PREPAREDNESS MEASURES	No precaution is needed	Fires including prescribed burns may be lit, used or maintained in the open air on the condition that persons making fires take reasonable precautions against the fires spreading	No fires may allowed in the open air except those that are authorized by the Fire Protection Officer exists, or elsewhere, the Chief Fire Officer of the local fire service, or fires in designated fireplaces.	No fires may be allowed under any circumstances in the open air.	No fires may be allowed under any circumstances in the open air and Fire Protection Associations and municipal Disaster Management Centres must invoke contingency fire emergency and disaster management plans including extraordinary readiness and response plans. All operations likely to ignite fires halted. Householders placed on alert.
APPLICATION OF THE ACT			Above precautionary measure to be prescribed and made applicable nationally on days rated moderate.	Section 10(1)(b) applies: no person may light, use or maintain a fire in the open air.	Section 10(1) (b) applies: no person may light, use or maintain a fire in the open air.
RELATIONSHIP WITH DISASTER MANAGEMENT				The threat of disastrous wildfires exists at municipal level under these conditions. Municipal Disaster Management Centres must invoke contingency plans and inform National and Provincial Disaster Management Centre. (Section 49 of the Disaster Management Act).	The threat of disastrous wildfires at provincial level exists under these conditions. Municipal Disaster Management Centres must invoke contingency plans and inform National and Provincial Disaster Management Centres. (Section 49 of the Disaster Management Act).

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9. List of districts and metros that will be covered by the system

Section 9(3) obliges the Minister to divide the entire country into separate regions, each region being one in which the fire danger is usually sufficiently uniform to allow for a single rating which is meaningful for the entire region. To that extent, the District municipal boundaries and the Metropolitan boundaries will represent separate fire region

STATION NO.	FORECAST STATION	DISTRICT/METROPOLITAN
68155	Lephalale	Waterberg
68174	Polokwane Wo	Capricorn
68183	Thohoyandou Wo	Vhembe
68191	Phalaborwa Airport	Mopani
68237	Tosca	Dr Ruth Segomotsi
68242	Mafikeng Wo	Ngaka Modiri Molema
68255	Rustenburg	Bojanala
68262	Pretoria Eendracht	City of Tshwane Metro
68267	Ermelo Wo	Gert Sibande
68286	Oudestad	Sekhukhune
68286	Machadodorp AWS	Nkangala
682290	Kruger Int Airport	Ehlanzeni
68333	Kuruman	John Taolo Gaetsewe
68345	Welkom	Lejweleputswa
68350	Potchefstroom	Dr Kenneth Kaunda
68353	Vereeniging	Sedibeng
68355	Kroonstad	Fezile Qabi

68361	Jhb botanical gardens	City of Johannesburg Metro
68361	Jhb botanical gardens	West Rand
68368	Johannesburg Int Wo	Ekurhuleni Metro
68377	Newcastle	Amajuba
68400	Makatini Research Cntr	Umkhanyakude
68424	Upington Wo	Siyanda
68438	Kimberley Wo	Frances Baard
68442	Bloemfontein Wo	Mangaung Metro
68461	Bethlehem Wo	Thabo Mofutshanyane
68479	Ladysmith	Uthukela
68487	Greytown	Umzinyathi
68493	Ulundi	Zululand
68494	Mandini	ILembe
68497	Mtunzini	Uthungulu
68512	Springbok Wo	Namakwa
68538	De Aar Wo	Pixley ka Seme
68541	Fauresmith	Xhariep
68570	Matatiele	Alfred Nzo
68577	Kokstad	Sisonke
68579	Paddock	Ugu
68581	Pietermaritzburg	UMgungundlovu
68594	Kin Shaka AWOS	eThekwini Metro
68614	Vredendal	West Coast
68647	Queenstown	Chris Hani
68649	Jamestown	Joel Qabi
68668	Umthatha	O.R. Tambo
68718	Robertson	Cape Winelands

68727	Beaufort West	Central Karoo
68754	Dohne Agr	Amathole
68819	Melteno Reservoir (CT)	City of Cape Town Metro
68828	George Wo	Eden
68840	Somerset East	Cacadu
68842	Port Elizabeth Wo	Nelson Mandela Bay Metro
68858	East London Wo	Buffalo City Metro
68925	Elgin exp farm Grabouw	Overberg

10. Map of districts and metropolitan areas