MARULA ESTATES LTD
P.O. Box 466-20117
Naivasha – Kenya

Ph. +254 722 509 748
Fax +254 790 566 612
marula@marulaestates.co.ke

To: The Chief Executive Officer
Water Resources Authority
P.O.Box 145250 – 00100 Nairobi

Through: Sub-Basin Area Coordinator
Water Resources Authority
P.O.Box 1577 – 20117 Naivasha

Subject: Request for Amendment of Water Permits from Class **C** to Class **D**

Dear Sir/Madam,

I am writing on behalf of **Marula Estates Ltd** to formally request the amendment of the water permits for the following boreholes from **Class C** to **Class D**:

- **Sungura** – Permit No. 13003/G
- **Pivot N** – Permit No. 11758/G
- **Pivot O** – Permit No. 11759/G
- **Ilkek Mboogani** – Permit No. 13324/G
- **Ilkek 2** – Permit No. 13232/G
- **Beatuline 4** – Permit No. 12709/G
- **Solar BH** – Permit No. 13041/G

The pump testing initially submitted during the permitting process was conducted using an inadequate pump. However, a second pump test was later conducted using a suitable pump, and in the presence of a WARMA technician from the Naivasha office. The results of this updated test confirmed that the water yields are sufficient to qualify for **Class D** permits. Please find attached the updated pump test reports for your review.

Furthermore, we would like to bring to your attention that the fees paid for each of the above-mentioned boreholes correspond to the amount required for **Class D** permits, not Class C.

We kindly request that you issue the revised permits as soon as possible, in order to avoid any risk of penalties due to this discrepancy.

Thank you for your attention and support. We look forward to your prompt response.

Yours faithfully, Field Manager **Marula Estates Ltd. Paolo Lovatelli**

MARULA ESTATES LTD.
P. O. Box 466 - 20117
NAIVASHA, KENYA
TEL: +254 790 566 612
+254 722 509 748
mail: marula@marulaestates.co.ke
Pin: P000626535

The Chief Executive Officer
Water Resources Management Authority
P.O. Box 45250 – 00100
NAIROBI

Form: WRMA 004
Catchment: RIFT VALLEY
WRMA ID: WRMA/20/
File: (WRMA/20/NSA/2GD/11759/G)

Water resources Management Authority
BOREHOLE COMPLETION RECORD

(To be submitted in triplicate) *(Rule 76, 77)*

Borehole No. C-
Borehole Name – **PIVOT O (DORSON TWO) - MARULA ESTATES LIMITED**
Formation – **VOLCANIC**

PARTICULARS OF APPLICANT		**DETAILS**	
1. Full name of applicant(s) (In Block Letters)		**MARULA ESTATES LIMITED**	
2. Category of Applicant – Individual, Group [Association, Society, Company, Institution]		**COMPANY**	
3. ID Number of Applicant (Individual) or Certificate Of Incorporation or Registration for Groups or Companies		**2638**	
Physical Address where water is to be used (see Sketch)		**Contact Address of Applicant**	
4. L/R Number(s)	**11367**	5. Box Number	**466**
6. Village(s)	**PIVOT O – DORSON II**	7. Town	**NAIVASHA**
8. Sub-location(s)	**MALEWA**	9. Post Code	**20117**
10. Location(s)	**TARAMBETA**	11. Telephone Contact (Landline)	**05050332**
12. Division(s).	**NAIVASHA CENTRAL**	13. Telephone Contact (Mobile)	**0722509748**
14. District(s)	**NAIVASHA**	15. Email Contact	**marura@africaonline.co.ke**

PARTICULARS OF CONTRACTOR		**MARULA ESTATES LIMITED**	
16. Box Number	**466**	22. License Number	**WD/WRC/001318**
17. Town	**NAIVASHA**	23. Gazetted On	**03rd October 2002**
18. Post Code	**20117**	24. Drilling Supervisor	**SIMON N. NJOROGE**
19. Telephone Contact (Landline)	**05050332**	25. Type and Make of Drill	**PERCUSSION RIG MASSENZA60**
20. Telephone Contact (Mobile)	**0722509748**		
21. Email Contact	**marula@africaonline.co.ke**		

INTENDED WATER USE	
Public W.S., Irrigation., Industries., Domestic., Stock, Other	**IRRIGATION**
PARTICULARS OF BOREHOLE	
Type of borehole: - Drilled, Driven, Bored, Jetted, other	**DRILLED**
Borehole Construction (also see sketch page 3)	

Drilling started (date)	**30/10/2024**	Drilling Completed (date)	**31/10/2024**	All works completed (date)	**02/11/2024**
Total Depth: Reported(m)	**130**	Measured (m)	**125**	Final (back-filled) Depth (m)	**5**
Hole Diameter (mm)	**406.4**	From (m)	**0**	To (m)	**130**
Hole Diameter (mm)	**254**	From (m)	**0**	To (m)	**130**

The Chief Executive Officer
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Form: WRMA 004
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File: (WRMA/20/NSA/2GD/11759/G)

Permanent casing									
Plain									
Type	**MILD STEEL**	Diam (mm)	**431.8 304.8**	Length (m)	**3 47 6 6**	From (m)	**GL GL 65 119**	To (m)	**3 47 71 125**
Type		Diam (mm)		Length (m)		From (m)		To (m)	
Slotted or Perforated									
Size and Description of opening									
Type	**MILD STEEL**	Diam (mm)	**304.8**	Length (m)	**18 48**	From (m)	**47 71**	To (m)	**65 119**
Screen:									
Type and Make			**MILD STEEL**						
Diameter (mm)	**304.8**	Length (m)	**66**	Set from (m)	**47**	To (m)	**See Attached Sketch**		
Gravel									
Size of grains (mm)	**2-4**	Roundness (good, fair, poor)	**GOOD**	Volume inserted in Annular Space (m^3)	**30 Tons**				
Open Hole									
Diam (mm)		From (m)		To (m)					
Aquifer									
1st Water Struck at (m)	**50-55**	Water Rest Level(m)							
2nd Aquifer Struck at (m)	**80-83**	Water Rest Level(m)							
3rd Aquifer Struck at (m)	**100-105**	Water Rest Level(m)							
4rd Aquifer Struck at (m)		Water Rest Level(m)							
Main Aquifer	**100-105**	Water Rest Level(m)							
Water Bearing Material	**Sediments, fractured lava**	From(m)	**80**	To (m)	**105**				
After pumping (hour)		**24**	Recovered to SWL in (Minutes)	**-**					
Expected production discharge (litres/hr)		**100,000**	With pump set at (m below surface)	**110**					

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Pumping Test Record in Summary (Detailed test records on attached sheets): (all depth measurements to be in metres below ground surface)		
	Test No. 1	**Test No.2**
Date of Test (day, month, year)	**4/11/2024**	
Depth of borehole at time of test (m)	**125**	
Water Entry (perforations or screen setting at time of test	**From (m) 47**	From (m)
	To (m) See Attached Sketch	To (m)
Static Water (SWL) Before test (m)	**23**	
Type of Pump (Bailer) used	**DS 95-6**	
Depth of Pump intake (m)	**110**	
Discharge (in litres per minute)	**1666.67**	
Pumping Water Level (PWL m)	**35**	
After pumping continuously for (hour)	**24**	
Time of Recovery to original SWL (minutes)	**17**	
Rates of Recovery –WL after 5 minutes (m)	**26.57**	
Rates of Recovery –WL after 20 minutes (m)	**-**	
Rates of Recovery –WL after 60 minutes (m)	**-**	
Rates of Recovery –WL after 120 minutes (m)	**-**	

(Additional pumping tests to be mentioned in REMARKS and included with file).
Government representative witnessing the test.....

Quality of Water					
Sample (Yes/No)	**YES**	Collected at (hour)	24hrs	On (date)	
Sediment	**None**	Taste	**Ok**	Odour	**None**
Color	**Clear**	Temperature(^{0}C)		Spec. Conductivity (µmho/cm^3)	

Remarks: (drilling difficulties, gravel-pack Details, all pertinent Information about the drilling And completion of the hole	**The borehole can be considered to Have good yield. It was drilled to a depth of 130m, cased with steel casings, Gravel-packed and developed until water was clear.**		
Drilling Supervisor		*Drilling Contractor*	
Signature	AQUAWELL SERVICES LTD SIMON NDUNG'U NJOROGE REGISTERED HYDROGEOLOGIST REG/LICENSE NO. WD/WRP 001/17 SIGN	Signature	MARULA ESTATES Ltd. P. O Box 466 - 20117, NAIVASHA Tel: 0790 566612 / 0722 509748 Email: marula@marulaestatesco.ke P000629585P
Name;	**SIMON N. NJOROGE**	Name:	**MARULA ESTATES LIMITED**
Date	14/11/2024	Date	14/11/2024

The Chief Executive Officer
Water Resources Management Authority
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Form: WRMA 004
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1. *Drillers Log*

GEOLOGICAL LOG

0m-25m	-	Trachytes
25m-40m	-	Lacustrine/lake deposits
20m-40m	-	Agglomerates
40m-60m	-	Pyroclastics/tuffs
60m-90m	-	Phonolites
90m-115m	-	Sediments mixed with clay
115m-120m	-	Fractured sediments
120m-130m	-	Phonolites

(Geologist's log on attached sheets)
Remarks or additional information on Driller's log, or on sketch of Borehole.

……
……
……
……
……
……

Total depth **130m**

(Sketch include: - depth and changes of hole diameter, casing positions, manner of casing (of different diam.) connections, and casing connection to screen, depths of screen or slotted casing lengths, how casing is closed at bottom, formation caving zones, and any other pertinent information)

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13. *Location Sketch:* (to be sketched by the driller on the site, showing roads, tracks and prominent land marks, with road Distances to nearest town or trading centre and to water source).



For Official Use Only

Entered on Schedule..... (Yes/No) Water Sample Received..... (Yes/No)
Drilling Sample Received..... (Yes/No) Chemical Analysis Received..... (Yes/No)
Drilling Sample Filed..... (Yes/No) Geologist's Log Available..... (Yes/No)
Location Plotted on Maps..... (Yes/No)

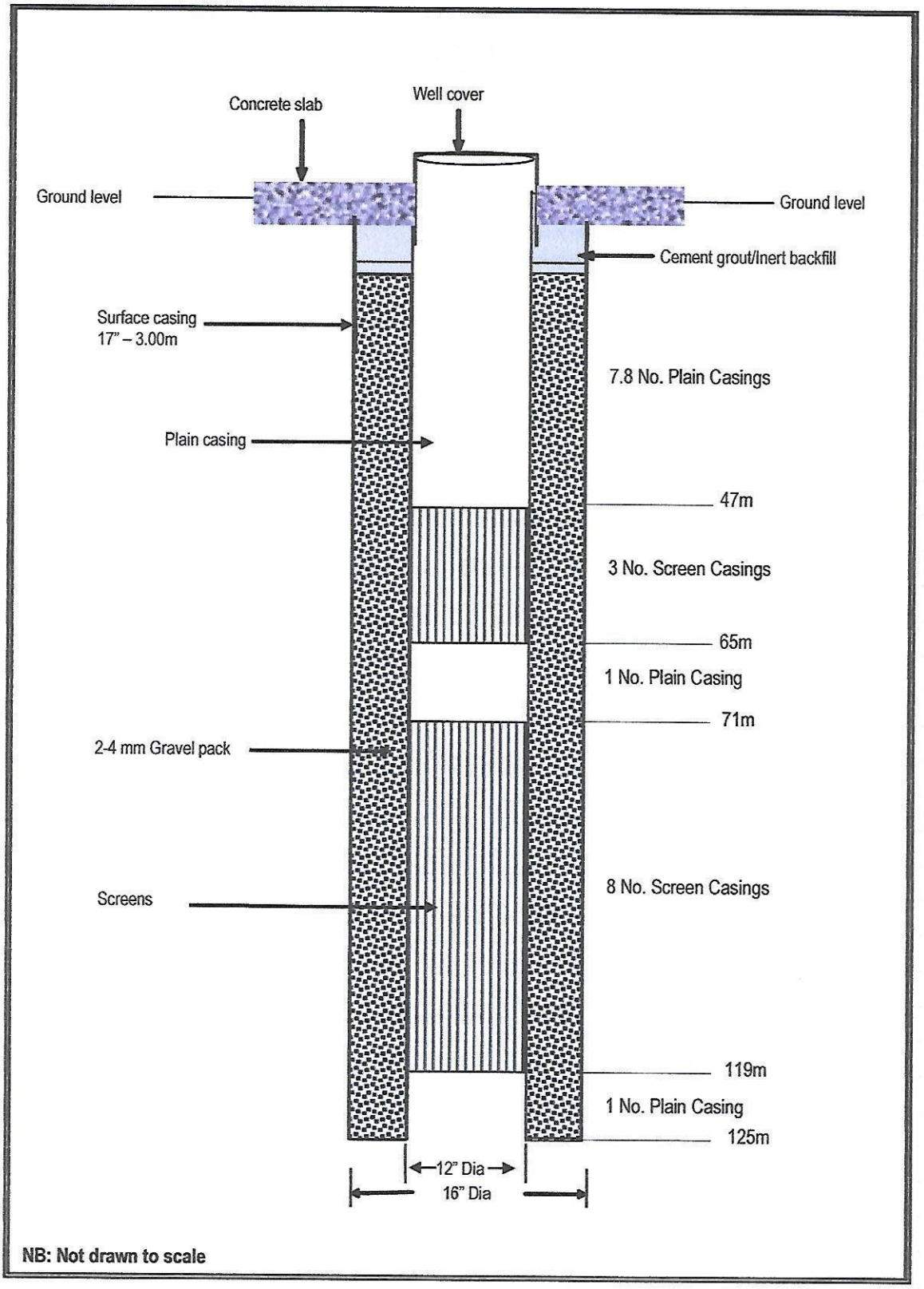
Hydro geological Report No.....of.....
(Date)
Geophysical Curve No.....of.....
(Date)

Borehole data entered and checked by (Name).....Signature.....

Permit Details

Permit Number..... ..... Authorized abstraction.....m^3/d
Authorized water use(s).....
Pump intake depth.....m bgl Maximum authorized abstraction rate.....m^3/hr
All borehole completion Records duly completed should be sent to the appropriate WRMA Regional Office

BOREHOLE CASING PROFILE AND CONSTRUCTION DESIGN



Well: DOWSON 2		*Total Depth of Well:*	130 M
Client:MARULA ESTATES LTD		*Depth of Pump Intake:*	60M
Location:37m 210830 9932784		*Datum Level:*	
Well Type:DRILLED		*Pump Type:*	SUBMERSIBLE 60HP
Testing Contractor: MARULA ESTATES		*Pipe Type &Size:*	GI 6"
Static Water Level: 36 M		*Power Source:*	GENERATOR
Pumping Water Level:	52.5M	*Water Column Available:*	

CONSTANT DISCHARGE DRAWDOWN TEST

Date	Time Interval	Elapsed Time (min)	Water Level (m bdl)	Drawdown (m)	Yield (m3/hr)	EC (uS/cm)	Remarks
18 July 2025		0	36.00		245.00		Start of discharge drawdown test
		1	37.50				
		2	39.00				
		3	40.20				
		4	42.00				
	1	5	43.50				
		6					
		7	44.20				
		8					
		9	45.80				
		10	47.00				
	2	12	48.40				
		14					
		16					
		18	49.00				
		20					
		25					
	3	30	49.50		230.00		
		35	50.20				
		40	51.30				
		45	52.00				
		50	52.50				
		55	52.50				
		60	52.50				
		75	52.50			;	
	5						
		90	52.50				
		105	52.50		225.00		
		120	52.50				
		150	52.50				
		180	52.50				
		210	52.50				
		240	52.50				
		300	52.50				
	7	360	52.50				
		420	52.50				
		480	52.50				
		540	52.50				
		600	52.50				
		660	52.50				
		720	52.50				
	30	780	52.50				
		840	52.50				
		900	52.50				
		960	52.50				
		1020	52.50				
		1080	52.50				
		1140	52.50				
	60	1200	52.50				
		1260	52.50				
		1320	52.50				
		1380	52.50				
	120	1440	52.50		225.00		drawdown test.

NAKURU WATER AND SANITATION SERVICES CO. LTD

Nakuru Water & Sanitation Services Co Ltd
Government Rd, Nawassco Plaza
Tel: 051- 2212269
Nakuru Water and Sanitation Services Company Ltd
P.O. Box 16314-20100 Nakuru
Toll Free Line 0800-720036
@Nakuru Water
infor@nakuruwater.co.ke
custcare@nakuruwater.co.ke
www.nakuruwater.co.ke

Enriching Life

Laboratory Test Report

Test Report No: **NAWASSCO/TES/331/24**

Report date: **November 28, 2024**

1. Description of Sample: Water **(DAWSON BH 2B)**
2. Sample Submitted by: **Marula Estate Ltd**
3. Contact Person: **Ms.Paneity**
4. Customer's Ref. No: **Private**
5. NAWASSCO Sample Ref. No: **437/24**
6. Date of Receipt: **November 13, 2024**
7. Date Analysis Started: **November 13, 2024**
8. Sample Analysis Request Form No: _
9. Customer Address: **P.O Box 466 Naivasha**
10. Parameters tested and method of test as listed below.

TEST	TEST METHOD	UNITS	RESULTS	LLD	KS EAS 12: 2018
pH	NLTM01_pH	pH Scale	7.4	1-13	6.5-8.5
*Color	HACH 8025	Pt.Co	76	1.0	15
Electrical Conductivity	NLTM17_EC	mS/cm	0.829	0.01	1.5
Total Dissolved Solids	NLTM17_TDS	mg/l	463	1.5	1000
*Turbidity	HACH 8237	mg/l	85	1	5
Total Suspended Solids	NLTM02_TSS	mg/l	18	1.0	0
*Ammonia NH_3	APHA 4500-NH_3	mg/l	0.11	0.05	0.5
*Nitrate	APHA 4500-NO_3	mg/l	7.89	0.05	45
Sulfate	NLTM15_SO_4	mg/l	50.18	1	400
*Total Hardness	APHA-4500 $CaCO_3$	mg/l	42.00	0.1	300
Chloride	APHA-4500 Cl^-	mg/l	59.99	2	250
Fluoride	NLTM16-F^-	mg/l	5.36	0.005	1.5
Lead	NLTM14_Pb	mg/l	<0.04	0.004	0.01
Iron	NLTM14_Fe	mg/l	0.210	0.02	0.3
Zinc	NLTM14_Zn	mg/l	0.015	0.02	5.0
Copper	NLTM14_Cu	mg/l	<0.01	0.01	1.0
Manganese	NLTM14_Mn	mg/l	0.014	0.01	0.1
Nickel	NLTM14_Ni	mg/l	<0.001	0.001	0.02
Chromium	NLTM14_Cr	mg/l	<0.01	0.01	0.05

TEST	TEST METHOD	UNITS	RESULTS	LLD	KS EAS 12:2018 STD
Sodium	NLTM13_Na	mg/l	100.51	0.01	200
Potassium	NLTM13_K	mg/l	21.85	0.01	50
Calcium	NLTM13_Ca	mg/l	18.09	0.002	150

KEY: KS EAS =Kenya (East Africa) Standard; LLD=Lowest Limit of Detection; NS=No Standard,*parameters not accredited

COMMENTS/REMARKS

Results are as shown above

28 NOV 2024

Ag.Technical Manager – Gilbert Mutai

Eliud K. Rotich – Technical Signatory

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"Unless otherwise stated, the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only (If not perishable) Note that all details in respect of the source and test results of similar samples are not verified or confirmed.

Chief Executive Officer
Water Resources Authority
P.O. Box 45250 - 00100 Nairobi,
Kenya

Form:WRA 011
Catchment:RIFT VALLEY
WRMA ID:WRA\20\06475
File:WRA/20/NSA/2GD/11759/G

Water Resources Authority

WATER PERMIT

(Rule 38)

By virtue of the authority vested in us by the Water Act 2016, we, the Water Resources Authority, do hereby grant unto (name) Marula Estates Ltd , on 28 March 2025 , or his/her/their executors, Administrators and assigns permission to use water in accordance with them details contained herein, subject to the provisions of the Water Act 2016, and the Rules thereunder, and the conditions following hereafter and endorsed hereon and attached hereto: -

Permit No.	WRA/20/NSA/2GD/11759/G				Permit Expiry Date	28-March-2030	
Type of Water Use	Surface water				GroundWater		Effluent discharge	Swamp Drainage
	Diversion	Abstraction	In-stream Works	Storage	Shallow Well	BoreHole		
Tick Box						X		

PARTICULARS OF APPLICANT	DETAILS
1. Full name of applicant(s) (In Block letters)	Marula Estates Ltd
2. Category of applicant - Individual, Group [Association, Society], Company, Institution	Company
4. iD Number of Applicant (Individual) or Certificate of Incorporation or Registration for Group or Companies	2638
5. PIN Number (where available)	P000629585P

Physical Address where water is to be used		Contact of Applicant	
6. L/R Number(s)	11367	7. Box Number	466
8. Villages(s) / Ward(s)	PIVOT O	9. Town	Naivasha
10. Sub-location(s)	TARAMBETE	11. Post Code	20117
12. Location(s)	MALEWA	13. Telephone Contact (Landline)	05050332
14. Division(s)	NAIVASHA CENTRAL	15. Telephone Contact (Mobile)	+254722509748
16. District(s)	NAIVASHA	17. Email Contact	marula@africaonline.co.ke

WATER RESOURCE DETAILS	DETAILS
17. Name of Body of Water or Aquifer where is to be diverted, abstracted or stored	Lake Naivasha
18. Is the point of abstration or storage in a Protected Area or a Groundwater Conservation Area? (yes/no)	YES
19. Sub-catchment Number	2GD
20. Class of Water Resource	(none)
21. Name of Body of Water or Aquifer where effluent is to be discharged	(none)
22. Sub-catchment Number (Effluent)	(none)
23. Class of Water Resource (Effluent)	(none)
24. Category of Application (Class of Permit)	C

Chief Executive Officer
Water Resources Authority
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Kenya

Form: WRA 010
Catchment: RIFT VALLEY
WRMA ID: WRA\20\06475
File: WRA/20/NSA/2GD/11759/G

SUPPLEMENT TO PERMIT/AUTHORISATION

25. Does permit include Supplements approved under Section 21 of WRMA Rules (yes/no)	NO
26. List Reference Number for each Supplement	

Brief Description of Project and Intended Use for Water Type of Water Use	BH 220M DEEP WATER IS FOR IRRIGATION PURPOSES			
Type of Water Use	**Groundwater (m3/day)**	**Surface Water (m3/day)**		
		River - Normal Condition	**River - Flood Condition**	**Lake**
1. Public				
2. Domestic				
3. Livestock				
4. Subsistence Irrigation				
5. Commercial Irrigation	600.000			
6. Industry / Commercial				
7. Hydropower				
8. Others				
9. Sub-Total	600.000			
10. Quantity Returned				
11. Water Abstracted (row 34 - row 35)	600.000			
12. Effluent Discharge				

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CONDITIONS OF PERMIT	DETAILS
Availability of Resource	When the resource availability drop into the Reserve, the permit holder is only entitled to Basic Human Needs
Water Quality Report	Water/Effluent quality analysis reports shall be submitted to WRA on a quarterly basis. 5.9g/l If the Fluoride is beyond the allowable limit, shall install a de-fluoridation system before water is made available for drinking purposes
Payment of Water Use Charges	The permit holder or his agent shall pay for water use as per the WRR, 2021 regulation 84(1)
Inspections	
1	The permit holder shall allow entry by Water Inspector/s when they demand to inspect the effluent discharge works as need arises
2	The control / measuring device shall be inspected regularly to ensure it is properly full
3	Actual abstraction volume shall be checked regularly to ensure compliance to permit conditions
4	Any late submission of the application for renewal of permit shall attract a penalty of twenty-five thousand (25,000) shillings per month as per the WRR, 2021 regulation 36(2)
Other Technical Details	
(a)	Shall maintain a record of water abstracted, diverted, stored or discharged, giving the date, time, from installed measuring device ,quality and quantity and the purpose or purposes for which such water was used, and such records shall be furnished to the Authority once a month.
(b)	The permit holder shall give the date, time, quality and quantity and methods of such abstractions, diversions, storage, or discharge and the purpose or purposes for which such water was used
(c)	The permit holder shall submit Water use self-assessment form WRMA 015 dully filled
(d)	This permit under Section 46(1) of the Water Act, 2016, Authority may vary the permit so as to alter the discharge or quantity of water or any other aspect of water use authorized by the permit, or alter the method or point of diversion or other specifications, terms or conditions of the permit.
Effluent Discharge Requirements	
I)	CUSTOMER TO SUBMIT LIQUID WASTE MANAGEMENT PLAN TO WATER RESOURCES AUTHORITY- Naivasha SUB-BASIN AREA OFFICE FOR ASSESSMENT AS TO WHETHER IT WARRANTS EFFLUENT DISCHARGE PERMIT
II)	THE PERMIT HOLDER SHALL INSTALL INLET AND OUTLET MEASURING DEVICE OF THE EFFLUENT TREATMENT PLANT AND SHALL MAINTAIN RECORDS OF EFFLUENT DISCHARGE IN TERMS OF QUANTITY AND QUALITY IN ACCORDANCE WITH THE EFFLUENT DISCHARGE CONTROL PLAN APPROVED BY THE AUTHORITY.
III)	THE EFFLUENT DISCHARGE RECORDS SHALL BE AVAILABLE FOR INSPECTION BY THE AUTHORITY AT REASONABLE TIME
IV)	PERMIT HOLDER TO ALLOW FOR REGULAR INSPECTION ON EFFLUENT DISCHARGE TO ENSURE COMPLIANCE TO EFFLUENT DISCHARGE THRESHOLDS AND EFFLUENT DISCHARGE GUIDELINE STANDARDS
Meter ID Numbers Related to this Permit	
1)	
2)	
3)	
4)	

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SURFACE WATER - ABSTRACTION, DIVERSION, IN-STREAM AND CONVEYANCE WORKS	
Grid Reference for Works (UTM ,based on ARC1960 Datum, Zone 36/37)	
Easting	
Northing	
Altitude (m above sea level)	
Map Sheet	
Weir (1) or Collection Chamber (2)	
Dimensions	
Width/diameter (m)	
Length (m)	
Height (m)	
Materials	
Compensation Flow Capacity (m3/day)	
Pump	
Type of Pump	
Type of driving machine	
Power source of driving machine (diesel, electric, wind, water)	
Maximum Power rating (KVa)	
Expected operating head (m)	
Delivery Rate at expected operating head (m3/hr)	
Expected operating hours (hrs)	

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Embankment	
Material (earth, concrete, masonry, others)	
Width at Crest (m)	
Length at Crest (m)	
Upstream slope (1 to ...)	
Downstream slope (1 to ...)	
Maximum Depth of Water (Measured from bed to normal water level) (m)	
Maximum Height of Embankment (m)	
Gross Freeboard (m)	
Net Freeboard (m)	
Impoundment	
Estimated Impounded Volume (m3)	
Other Details	
Maximum Drawoff Capacity (m3/day)	
Maximum Compensation Flow capacity (m3/day)	

SWAMP DRAINAGE

Name of swamp	
Size of swamp to be drained (ha)	
Purpose of swamp drainage (agricultural, residential, recreational, public health, industrial, abstraction)	
Expected reduction in water level in swamp (m)	
Means of swamp drainage (tick as appropriate)	
Channelling or canalisation of flows	
Diversion of inflow	
Expected % of inflow waters to be diverted	
Construction of drainage canals or drainage pipes	

Chief Executive Officer
Water Resources Authority
P.O. Box 45250 - 00100 Nairobi,
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Form:WRA 010
Catchment:RIFT VALLEY
WRMA ID:WRA\20\06475
File:WRA/20/NSA/2GD/11759/G

Canal	
Length (m)	
Top width (m)	
Bottom width (m)	
Lined or unlined	
Lining material	
Gradient (m/100m or %)	
Maximum velocity (m/s)	
Maximum velocity (m/s)	
Pipeline	
Internal diameter of delivery pipe (mm)	
Maximum Capacity (m3/day	

GROUNDWATER

Grid Reference for Works (UTM ,based on ARC1960 Datum, Zone 36/37)	
Easting	208823
Northing	9933765
Altitude (m above sea level)	1922
Map Sheet	133/2
W.R.M.A. number of well/ borehole	
Total depth of well/ borehole	
Depth to which the cylinder or suction pipe may be installed	

STORAGE DAM

Name of dam	
Class of Dam (A, B or C)	
Grid Reference for Works (UTM ,based on ARC1960 Datum, Zone 36/37)	
Easting	
Northing	
Altitude (m above sea level)	
Map Sheet	
Width (m)	
Length (m)	
Height (m)	

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Catchment:RIFT VALLEY
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File:WRA/20/NSA/2GD/11759/G

EFFLUENT DISCHARGE

Grid Reference for Works (UTM ,based on ARC1960 Datum, Zone 36/37)	
Easting	
Northing	
Altitude (m above sea level)	
Map Sheet	
Source of water supply	
Source of Effluent (domestic, institutions, industrial, agricultural, urban)	
Mode of discharge (pipe, canal...)	
Maximum Daily Effluent discharge (m3/day)	
Nature of Pollutants (Chemical, biological, physical)	
Details of Treatment System	
Chemical	
Settling	
Anaerobic digesters	
Oxidation or aerated ponds	
Natural or constructed Wetland	
Other (specify)	
Retention time (days)	

EFFLUENT QUALITY

Parameter	Units	Guideline Value	Parameter	Units	Guideline Value
BOD (5 days at 20C	mg/l		Total Phosphorous	mg/l	
COD	mg/l		Total Nitrogen	mg/l	
Total Dissolved Solids	mg/l		Total suspended solids	mg/l	
pH	pH Scale		Metals	mg/l	
Temperature	oC		Non Metal toxics (sulphides,cyanides,fluorides)	mg/l	
Total Coliforms	Counts/100ml		Pesticide residues	ug/l	
Turbidity or colour	NTU/Hazen		Phenols	mg/l	
Ammonia -NH3	mg/l		Oils and grease		
Ammonium–NH4	mg/l		Others		
Nitrite – NO2	mg/l				
Nitrate-NO3	mg/l				

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SIGNATURE

Yours faithfully,

Signature of WRA Officer	
Name of Officer	LUCY FUNDI
Position of Officer	SUB-BASIN AREA CO-ORDINATOR
Date of Signature	02 -Apr-2025