



MINISTRY OF HEALTH

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GOVERNMENT CHEMIST DIVISION

P. O. Box 20753-00202 ,KNH

NAIROBI

When replying please quote

29th August, 2018

Ref No. P.WAT/VOL I/18/19/9

And date

REPORT ON CHEMICAL ANALYSIS OF WATER

Laboratory sample No.20/17/18

Date Received: 27/8/18

Sender: Spar Drilling Co. Ltd.

P. O. Box 40590, NAIROBI

Source:-Borehole:- Sigowet Primary School (Bomet)

Date sample taken

PHYSICAL TESTS

Colour:	-	(Hazen Units)	Turbidity:	Clear	(J.T.U.'s)
Deposit	None		Odour:	None	(T.O.N)
Taste	-				
pH:	8.3		Electrical Conductivity at 25 °C (microsiemens/cm)		
					953.0

CHEMICAL TESTS

	Results mg/l(ppm)	Max guideline value mg/l(ppm)
Total Alkalinity as CaCO ₃	350.0	500.0
Phenolphthalein (CO ₃) =	20.0	-
Methyl Orange (HCO ₃)-	330.0	-
Chloride (Cl)-	20.0	250.0
Sulphate (SO ₄)=	16.0	250.0
Nitrate (NO ₃)-	1.4	
Nitrite (NO ₂)-	0.024	3.0
Fluoride (F)-	7.0	1.5
Total Anions		

P.T.O

	<u>Results mg/l(ppm)</u>	<u>Max guideline value mg/l(ppm)</u>
Sodium (Na)+	121.2	200.0
Potassium (K)+	10.4	-
Calcium (Ca)++	28.0	-
Magnesium (Mg)++	12.0	-
Iron (Total) (Fe)+++	0.04	0.3
Manganese (Mn)++	Not detected	0.5
Ammonia-Free & Saline (N)	-	
Ammonia-Albuminoid (N)	-	
Total Cations		
Carbonate Hardness as (CaCO ₃)	100.0	-
Non-Carbonate hardness as (CaCO ₃)	Nil	-
Total Hardness as (CaCO ₃)	100.0	500.0
Free Carbon Dioxide	-	-
Silica (SiO ₂)	59.0	-
Oxygen absorbed. 4 hr. at 27°C(P.V.)	0.2	1.0
Total Dissolved Solids, residue dried at 180°C	668.0	1000.0
Optional Parameters (done on request)		
Lead (Pb ²⁺)		
Copper (Cu ²⁺)		
Zinc (Zn ²⁺)		

REMARKS:

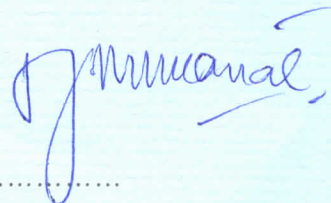
Moderately soft and alkaline water that is well mineralized.

The fluoride level is above the WHO maximum guideline value of 1.5 ppm for drinking water.

Treatment to lower this level is recommended.

Date .. 29/08/2018

F. M. MAINA



For: Government Chemist



Water Resources Management Authority

BOREHOLE COMPLETION RECORD

(To be submitted in triplicate)

(Rule 76,77)

Borehole No. WRMA/12/KCO/IJC/10300/G

Borehole Name: Sigowet Primary School

Formation.....

PARTICULARS OF APPLICANT			DETAILS		
1. Full name of applicant(s) (In Block Letters)			Sigowet Primary School		
2. Category of Applicant - Individual, Group [Association, Society], Company, Institution			Institution		
3. ID Number of Applicant (Individual) or Certificate of Incorporation or Registration for Groups or Companies					
Physical Address where water is to be used (see sketch)			Contact Address of Applicant		
4. L/R Number(s)			5. Box Number	-	
6. Village(s)/Ward(s)	Sigowet		7. Town	-	
8. Sub-location(s)	Kichutumo		9. Post Code	-	
10. Location(s)	Chemaner		11. Telephone Contact (Landline)	-	
12. Division(s)	Longisa		13. Telephone Contact (Mobile)	+254714-373-871	
14. District(s)	Bomet		15. Email Contact	-	
PARTICULARS OF CONTRACTOR					
16. Box Number	40590		22. License Number	WD/WRC 001/65	
17. Town	Nairobi		23. Gazetted On	2008	
18. Post Code	00100		24. Drilling Supervisor	Mr. Ibrahim Olik	
19. Telephone Contact (Landline)	8562545 / 8562626 8562969		25. Type and Make of Drill Rig	P.R.D	
20. Telephone Contact (Mobile)	0722517433 / 0722525020 0733517474 / 0733999949				
21. Email Contact	info@sparrdrilling.com				
INTENDED USE OF WATER					
Public W.S.; Irrigation.; Industries.; Domestic.; Stock, other			Institution		
PARTICULARS OF BOREHOLE					
Type of Borehole: - Drilled; Driven; Bored; Jetted; Other			Drilled		
Borehole Construction (also see sketch page 3)					
Drilling started (date)	4 th Aug, 2018	Drilling completed (date)	5 th Aug, 2018	All work completed (date)	6 th Aug, 2018
Total Depth: Reported (m)	180m	Measured (m)	180m	Final (back-filled) Depth (m)	180m
Hole Diameter (mm) 254	10"	From (m)	0m	To (m)	6m
Hole Diameter (mm) 216	8.5"	From (m)	6m	To (m)	180m
Hole Diameter (mm) 216	8.5"	From (m)		To (m)	
Hole Diameter (mm) 216	8.5"	From (m)		To (m)	





Permanent Casing									
Plain									
Type	Steel	Diam (mm)	152mm	Length (m)	6	From (m)	132m	To (m)	138m
Type	Steel	Diam (mm)	152mm	Length (m)	6	From (m)	150m	To (m)	162m
Type	Steel	Diam (mm)	152mm	Length (m)	6	From (m)	174m	To (m)	180m
Slotted or Perforated:									
Size and Description of Openings									
Type	Steel	Diam (mm)	150mm	Length (m)	6	From (m)	138m	To (m)	150m
Type	Steel	Diam (mm)	150mm	Length (m)	6	From (m)	162m	To (m)	174m
Screen:									
Type and Make									
Diameter (mm)		Length (m)		set from (m)		To (m)			
Gravel Pack									
Size of grains (mm)	2mm-4mm		Roundness (good, fair, poor)	Good		Volume inserted in annular Space (m ³)	3.4m ³		
			From (m)			To (m)			
Open Hole									
Diam (mm)		From (m)				To (m)			
Aquifer									
1 st Water Struck at (m)			Water Rest Level (m)	10.80m					
2 nd Water Struck at (m)			Water Rest Level (m)						
Main Aquifer Struck at (m)			Water Rest Level (m)						
Water bearing material		From (m)			To (m)				
Other Aquifers, Remarks, etc (also see log on page3)									
Yield: SWL (m)	10.80m		PWL (m below surface)	26.10m		Discharge (litres per minute)	166.7 ltrs/min.		
After pumping (hours)	24hrs		Recovered to SWL in (minutes)	60min					
Expected production discharge (litres per hour)	10.000 l/hr		With pump set at (m below surface)	156m					





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)	7 th August, 2018	
Depth of Borehole at time of test (m)	180m	
Water Entry (perforations or screen setting at time of test)	From (m) 162	From (m) 138
	To (m) 174	To (m) 150
Static Water (SWL) before test (m)	10.80m	
Type of Pump (Bailler) used	-	
Depth of Pump intake (m)	156m	
Discharge (in litres per minute)	166.7 ltrs/min	
Pumping Water Level (PWL m)	26.10m	
After pumping continuously for (hours)	24 Hrs	
Time of Recovery to Original SWL (minutes)	40min	
Rate of Recovery-WL after 5 minutes (m)	17.61m	
Rate of Recovery-WL after 20 minutes (m)	13.86m	
Rate of Recovery-WL after 60 minutes (m)	-	
Rate of Recovery-WL after 180 minutes (m)	-	

(Additional pumping tests to be mentioned in REMARKS and included with file).

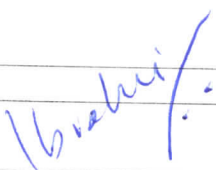
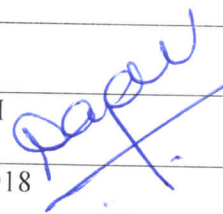
Government representative witnessing the test.....

Quality of Water					
Sample (Yes/No)		Collected at (hour)		On (date)	
Sediment		Taste		Odour	
Colour		Temperature (0c)		Spec. Conductivity ($\mu\text{mho}/\text{cm}^3$)	

Remarks: (drilling difficulties, gravel-pack details, all pertinent information about the drilling and completion of the hole)	
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<i>Drilling Supervisor</i>		<i>Drilling Contractor</i>	
Signature		Signature	
Name	MR. IBRAHIM OLIK	Name	MR. A.C. RAJANI
Date	27 TH AUGUST, 2018	Date	27 TH AUGUST, 2018



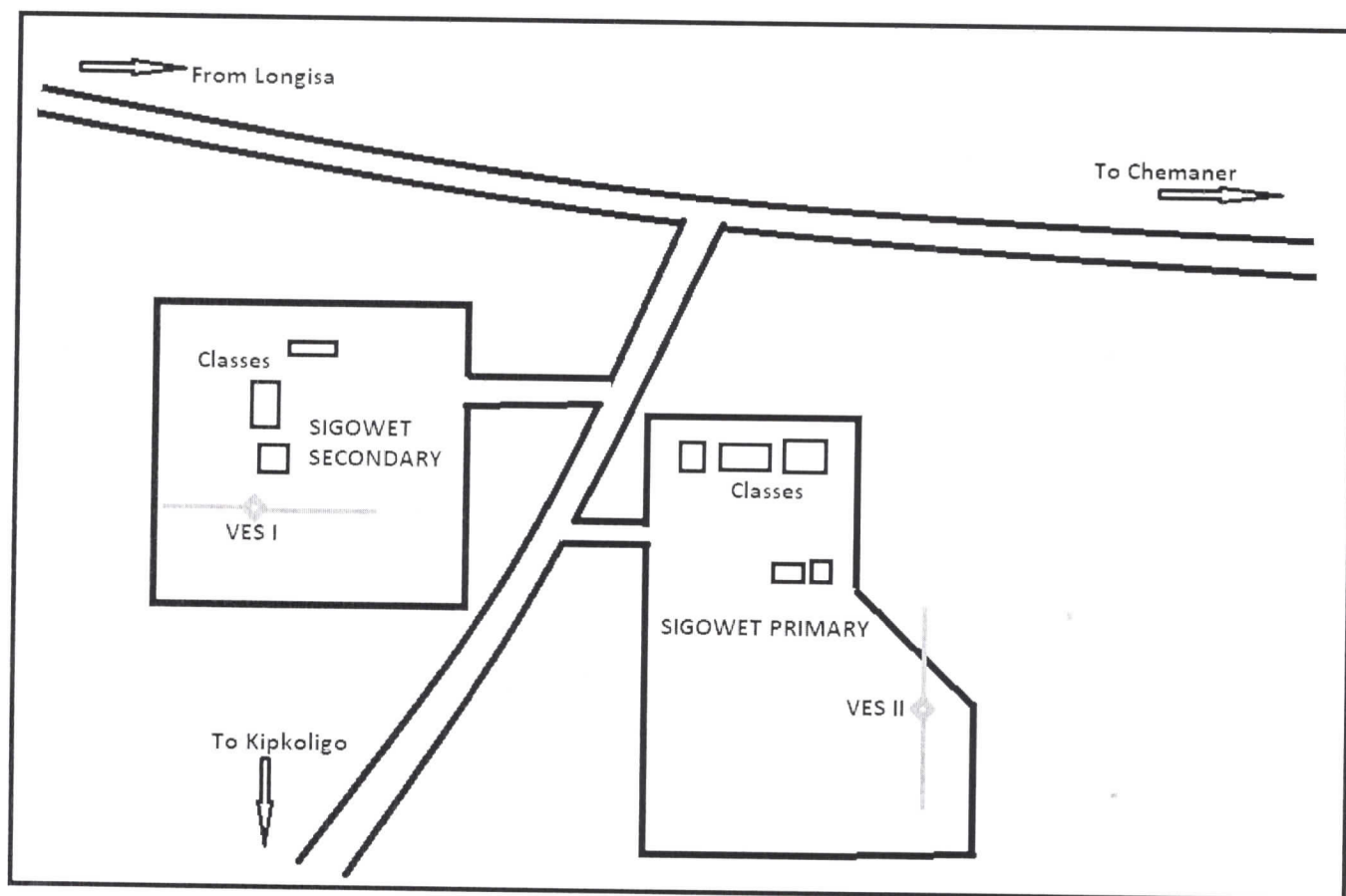
12. *Sketch of Borehole Construction:*

A schematic diagram of a well. A vertical cylinder represents the casing. A horizontal line across the top of the casing indicates the ground level. An arrow points from the label 'Casing' to the top edge of the cylinder. Another arrow points from the label 'Ground' to the ground level line. To the right of the casing, the text 'Metres (m)' is written. The area between the casing and the ground level line is filled with diagonal hatching lines.

[illegible]

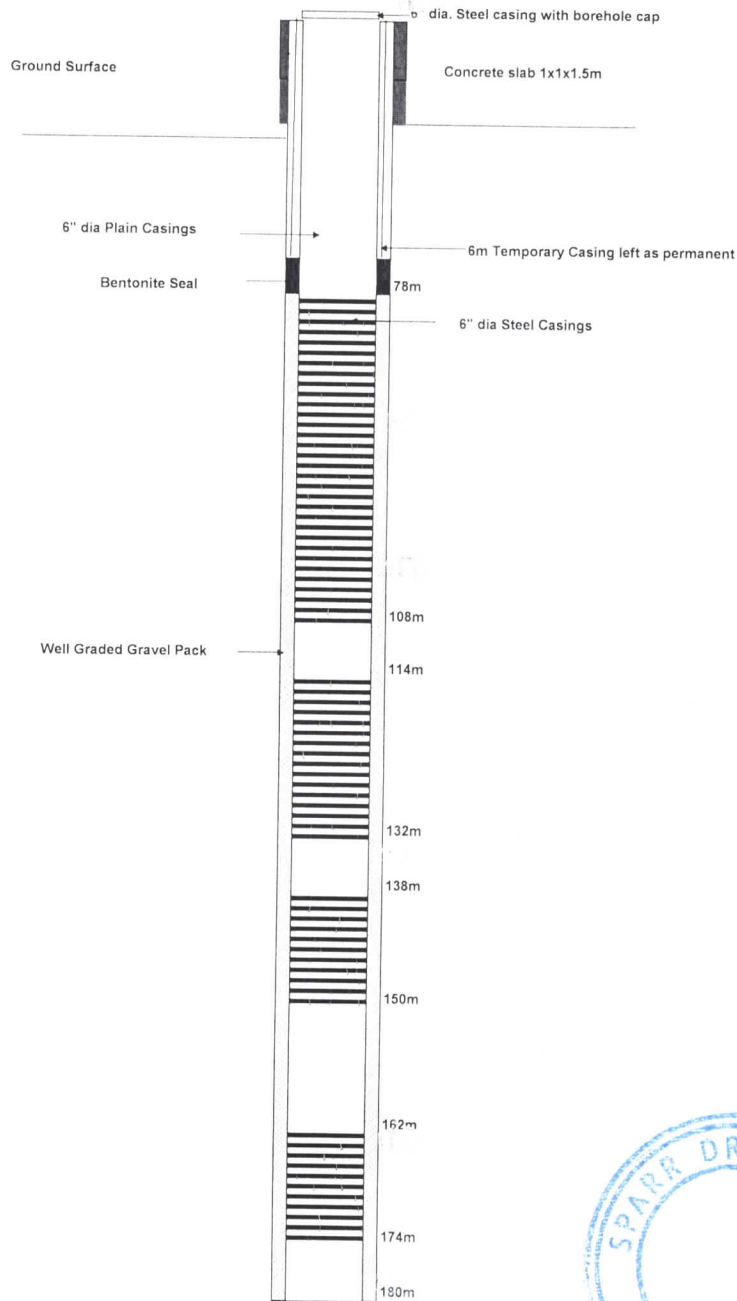


APPENDIX IV- Sketch Map of Sigowet Site



Sketch of Final Borehole Construction:
 Client Name: Sigowet Primary School
 Borehole Site: Migori

Borehole No: C-



Total Depth: 180.00 Metres



CONSTANT RATE DISCHARGE TEST PUMPING (24 HOURS)

Date:	7th August, 2018	Testing Contractor	Sparr Drilling Co. Ltd
Client:	Sigowet Primary School	Depth of Pump intake	156m
Location:	Migori	Pumping Water Level	26.10m
Borehole Depth:	180m	Static Water Level	10.80m

[illegible]

