THE PROPOSED

ELDORET ICDC INDUSTRIAL PARK

BASELINE WATER QUALITY ASSESSMENT REPORT

APRIL 6TH 2016

CONSULTANTS:

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PRREPARED BY:

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i) EXECUTIVE SUMMARY

Experts from Ecoserv Laboratory and Tehilla Company Limited collected water samples from the proposed Eldoret ICDC Industrial Park on 18 th April 2016 and submitted to NEMA Accredited Laboratory to establish the baseline water quality before the development at the site. *(The analysis Report from approved NEMA Laboratory is appended in this report)*

The results of the water analysis indicate low levels of most parameters measured. However the analysis also shows high turbidity and thus the water needs filtration and disinfection before use.

Albert Muriuki
Ecoserv Laboratory
NEMA Registered Laboratory

Jimmy Wakaimba
Tehilla Company Limited
NEMA Registered Firm of Experts

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1.0 INTRODUCTION

1.1 Water sample

The water samples collected and were taken to Eldoret Water and Sanitation Company Limited , a NEMA accredited Laboratory for analysis. The Following parameters were checked:

- Turbidity
- Ph
- Total Dissolved Solids
- Nitrates
- Phosphates
- Conductivity
- Faecal Coliform
- Total Hardness
- Iron
- Fluorride
- Sulphates
- Manganese
- Chloride
- Zinc

1.2 The aim of the assessment

The aim of the assessment was to establish the baseline water quality at the proposed Eldoret ICDC Industrial Park land before development and to obtain data that can be used to form basis for planning the control measures to eliminate or minimize pollution to water and environment after development.

1.3 The Water standards (benchmark)

After analysis, the water readings were compared with the standards from NEMA Legal Notice No. 120, Third Schedule 'Guideline Standards for Discharge of effluent into the environment'. The Schedule is attached in Appendix 2.

2.0 WATER QUALITY ASSESSMENT

The water samples were collected by the NEMA Lead Expert and Laboratory representative and taken to NEMA accredited Laboratory for Analysis. The water sampling position/location is indicated on **Plates 1** to **2** . and shown on figure 1 below. The reports from the laboratory are appended in this report.

2.1 Observations during survey

During the survey, the following observation was made:

- The proposed land was devoid of any development and was used by local community as grazing land.

During the survey period, there was no wind or rain to affect the measurement.

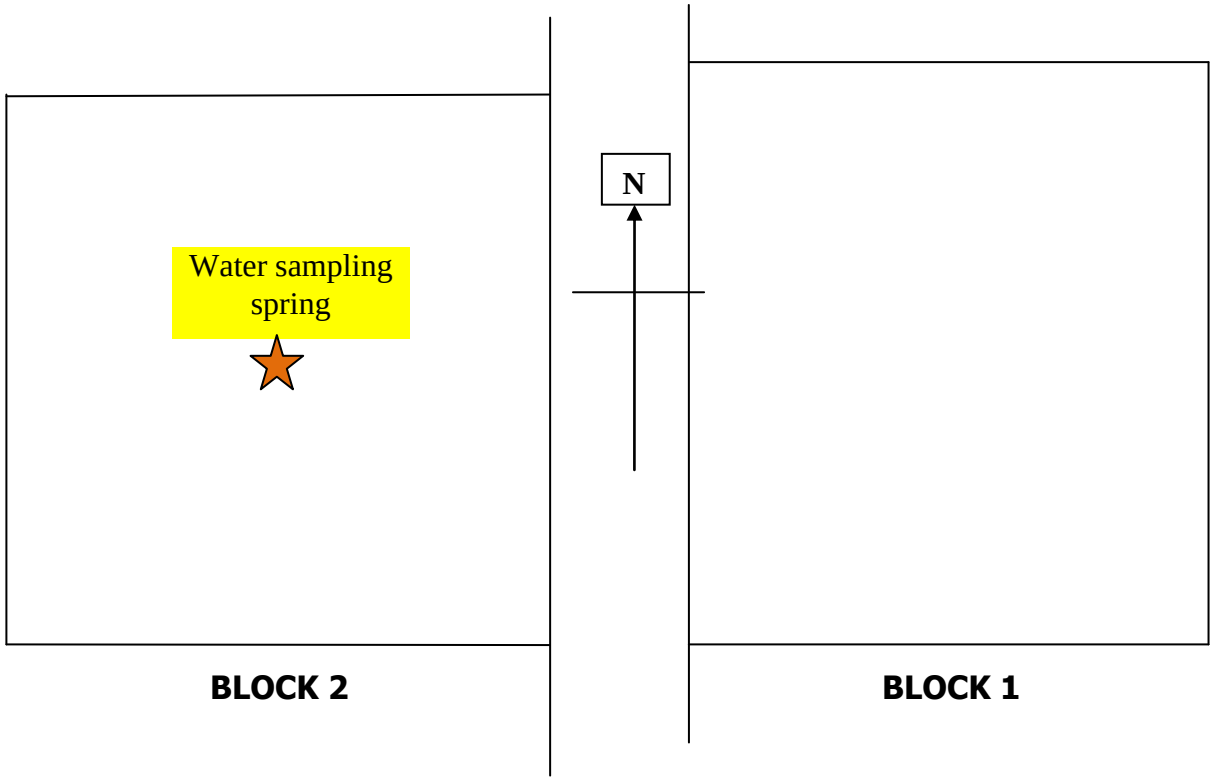

Fig. 1 Sketch Diagram showing water sample collection location

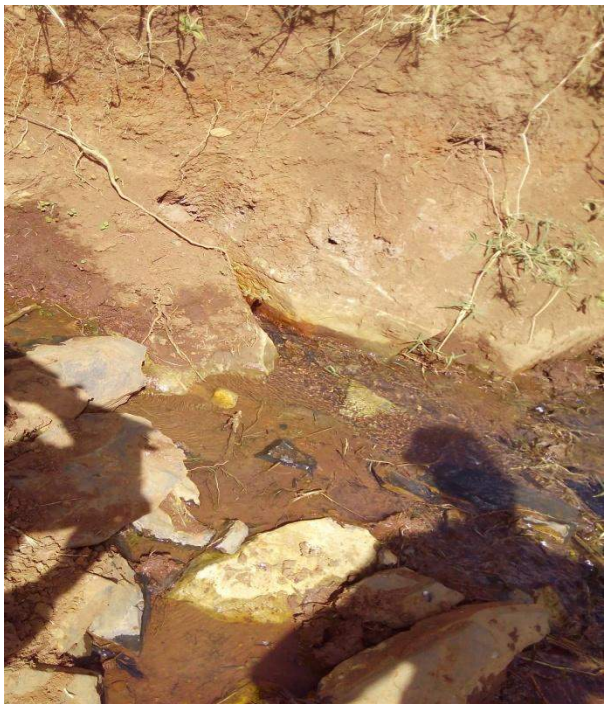

Plate 1:Spring source at site

Plate 2:Water sample was collected here

2.2 Results

Table 1: Water Quality

POSITION		UNITS	RESULTS	MAXIMUM ALLOWABLE LIMITS	REMARKS
1	Turbidity	**NTU**	**12.4**	5.0	Above limit
2	Ph	**Ph units**	**5.9**	6.5-8.5	Below the limit
3	Total Dissolved Solids	**Mg/L**	**5.4**	1200	Within the limit
4	Nitrates	**Mg/L**	**1.1**	10.0	Within the limit
5	Phosphates	**Mg/L**	**1.45**	5.0	Within the limit
6	Conductivity	**µS/CM**	**87**	1500	Within the limit
7	Faecal Coliform	**Cfu/100ml**	**30**	Nil	Above the limit
8	Total Hardness	**Mg/L**	**2.96**	100	Within the limit
9	Iron	**Mg/L**	**0.109**	0.3	Within the limit
10	Fluoride	**Mg/L**	**0.07**	1.5	Within the limit
11	Sulphates	**Mg/L**	**1.3**	250	Within the limit
1	Manganese	Mg/L	**0.2**	0.2	Within the limit
2	Chloride	Mg/L	2**.61**	250	Within the limit
3	Zinc	Mg/L	**0.12**	1.5	Within the limit

2.2.1 Discussion of results

The results of this water analysis, indicate levels of most of the parameters assessed are within the limit. However Turbidity, Ph and Faecal Coliforms are not within the limits.

3.0 CONCLUSIONS

From the survey it is concluded that the water quality at the proposed project site is contaminated and needs filtration and disinfection before use.

4.0 RECOMMENDATIONS

Another water quality survey needs to be carried out after land development .

Signature of Approved Person

Albert W. Muriuki MSc (Occ. Hgy.) UK.
NEMA Registered EIA Lead Expert/ Safety Auditor
Ecoserv Laboratory
NEMA Registered Laboratory

Dated 9/04/2016

APPENDIX 1: SPRING WATER ANALYSIS RESULTS FROM NEMA ACCREDITED LABORATORY(ELDOWAS)

ELDORET WATER AND SANITATION COMPANY LIMITED

CENTRAL WATER TESTING LABORATORY

Submitted by: *ICDC-Eldoret*

Sampling date: *18/04/2016*

Sample no. : *1211-15/16*

Source : *Spring-Cherunya Farm Block 15/1757 Eldoret Municipality*

Date received: *18/04/2016*

TEST RESULTS

Parameters	Units	Result	Max. Allowable Limits
Turbidity	*NTU*	12.4	5.0
pH	*pHunits*	5.9	6.5-8.5
Total Dissolved solids	*Mg/L*	54	1200
Nitrates	*Mg/L*	1.1	10.0
Phosphates	*Mg/L*	1.45	5.0
Conductivity	*µs/cm*	87	1500
Faecal coliform	*Cfu/100ML*	30	Nil
Total Hardness	*Mg/L*	2.96	100
Iron	*Mg/L*	0.109	0.3
Fluoride	*Mg/L*	0.07	1.5
Sulphates	*Mg/L*	1.3	250
Manganese	*Mg/L*	0.2	0.2
Chloride	*Mg/L*	2.61	250
Zinc	*Mg/L*	0.12	1.5

Comments: Contaminated water with high Turbidity, water needs Filtration and Disinfection before use.

Sign.....

QUALITY ASSURANCE MANAGER.

ELDORET WATER & SANITATION CO. LTD. (ELDOWAS)
20 APR 2016
P. O. Box 8418 ELDORET-30100
Email-info@eldowas.org

APPENDIX 2: LEGAL NOTICE NO. 120,ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION (WATER QUALITY) REGULATIONS, 2006.

(r. 11)

THIRD SCHEDULE

STANDARDS FOR EFFLUENT DISCHARGE INTO THE ENVIRONMENT

Parameter	Max Allowable(Limits)
1,1,1-trichloroethane (mg/l)	3
1,1,2-trichloethane (mg/l)	0.06
1,1-dichloroethylene	0.2
1,2-dichloroethane	0.04
1,3-dichloropropene (mg/l)	0.02
Alkyl Mercury compounds	Nd
Ammonia, ammonium compounds, NO_3 compounds and NO_2 compounds (Sum total of ammonia-N times 4 plus nitrate-N and Nitrite-N) (mg/l)	100
Arsenic (mg/l)	0.02
Arsenic and its compounds (mg/l)	0.1
Benzene (mg/l)	0.1
Biochemical Oxygen Demand (BOD 5days at 20 °C) (mg/l)	30
Boron (mg/l)	1.0
Boron and its compounds – non marine (mg/l)	10
Boron and its compounds –marine (mg/l)	30
Cadmium (mg/l)	0.01
Cadmium and its compounds (mg/l)	0.1
Carbon tetrachloride	0.02
Chemical Oxygen Demand (COD (mg/l)	50
Chromium VI (mg/l)	0.05
Chloride (mg/l)	250
Chlorine free residue	0.10
Chromium total	2
cis –1,2- dichloro ethylene	0.4
Copper (mg/l)	1.0
Dichloromethane (mg/l)	0.2
Dissolved iron (mg/l)	10
Dissolved Manganese(mg/l)	10
E.coli (Counts / 100 ml)	Nil
Fluoride (mg/l)	1.5
Fluoride and its compounds (marine and non-marine) (mg/l)	8
Lead (mg/l)	0.01
Lead and its compounds (mg/l)	0.1
n-Hexane extracts (animal and vegetable fats) (mg/l)	30
n-Hexane extracts (mineral oil) (mg/l)	5
Oil and grease	Nil
Organo-Phosphorus compounds (parathion,methyl parathion,methyl demeton and Ethyl parantrophenyl phenylphosphorothroate, EPN only) (mg/l)	1.0
Polychlorinated biphenyls, PCBs (mg/l)	0.003
pH (Hydrogen ion activity----marine)	5.0-9.0
pH (Hydrogen ion activity--non marine)	6.5-8.5
Phenols (mg/l)	0.001
Selenium (mg/l)	0.01
Selenium and its compounds (mg/l)	0.1
Hexavalent Chromium VI compounds (mg/l)	0.5
Sulphide (mg/l)	0.1
Simazine (mg/l)	0.03
Total Suspended Solids, (mg/l)	30
Tetrachloroethylene (mg/l)	0.1
Thiobencarb (mg/l)	0.1
Temperature (in degrees celious) based on ambient temperature	± 3
Thiram (mg/l)	0.06
Total coliforms (counts /100 ml)	30
Total Cyanogen (mg/l)	Nd
Total Nickel (mg/l)	0.3
Total Dissolved solids (mg/l)	1200
Colour in Hazen Units (H.U)	15
Detergents (mg/l)	Nil
Total mercury (mg/l)	0.005
Trichloroethylene (mg/l)	0.3
Zinc (mg/l)	0.5
Whole effluent toxicity	
Total Phosphorus (mg/l)	2 Guideline value
Total Nitrogen	2 Guideline value

And any other parameters as may be prescribed by the Authority from time to time

Remarks

Standard values are daily/monthly average discharge values. Not detectable (nd) means that the pollution status is below the detectable level by the measurement methods established by the Authority.