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COMPANY PROFILE

WATER RESOURCES & ENVIRONMENTAL MANAGEMENT CONSULTANTS

GROUNDWATCH GLOBAL LIMITED

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COMPANY PROFILE

ABOUT US

Groundwatch global limited is a private company registered under the Kenya companies act (cap.486). The company is young and dynamic, offering comprehensive water, subsurface and environmental consultancy services that meet international standards, using modern technology like advanced geophysics and GIS & remote sensing. Throughout Africa, we work on smart solutions, innovations and applications for people, environment and society. We operate on all forms of geological and geomorphological setup.

Managing these vulnerable areas is complex, which is why we work closely with other stakeholders both locally and internationally to deliver on internationally accepted services. Enabling lives is our hallmark of success. As a consultancy firm, Groundwatch global ltd achievement can be measured in the extent to which our expert knowledge can be used in and for society. For Groundwatch the quality of our expertise and advice comes first. We work to provide practical solutions to integrated water and environmental management challenges at all scales.

MISSION AND GOALS

To be leading the way in Water Resources Assessment and Environmental Management in Africa.

OUR MANDATE

Knowledge is Our Core Business

All contracts and projects, whether financed privately or from strategic research budgets, contribute to the consolidation of our knowledge base.

From Small to Global Scale

With a range of other disciplines, we integrate our water and environmental skills to develop tailor-made solutions to real issues. Through the coordination of physical boundary conditions, a carefully defined research methodology and careful attention to managerial aspects, we seek more efficient management of land, water and associated resources. Part and parcel of this approach are creative solutions. From a household plot to a global scale, in collaboration with government agencies, private companies and NGOs, we search for the most effective interventions.

Dedication and Commitment

We are a team of highly committed and enthusiastic water and environmental experts with many years of experience. We deploy our knowledge and skills in the pursuance of clean and safe water at the same time conserve environment for all.

Tailor Made Solutions

At the outset, each consultancy request is evaluated to decide which expertise, skills and methods can be best used to tackle a problem most effectively and efficiently. Tailor-made solutions are what make the goods and services of GroundwatCH Global Ltd applicable, socially important and unique.

OUR SERVICES

Groundwater Surveys, Hydrogeological and Geophysical Surveys

1. Borehole Site Investigations – Site suitable for drilling boreholes or shallow wells.
2. Groundwater Surveys - For Borehole Site Investigations, groundwater availability studies and management, water resources management, aquifer mapping and modeling, well-field designs,

groundwater monitoring, aquifer studies. Borehole condition assessment, groundwater recharge, groundwater quality assessment, determination of groundwater abstraction patterns and borehole density etc.

3. Hydrogeological Surveys- correlation of the available borehole data during site visits/campaign.
4. Geophysical Surveys - Determination of aquifer characteristics and types, aquifer size/location and depth, groundwater quality and hydrochemistry, abstraction patterns and aquifer depletion, groundwater recharge, saline water intrusion, aquifer contamination etc.
5. Aquifer Studies - Aquifer modeling, determination of aquifer characteristics and types, aquifer size/location and depth, groundwater quality and hydrochemistry, abstraction patterns and aquifer depletion, groundwater recharge, saline water intrusion, aquifer contamination etc.
6. Groundwater modeling- Presentation of groundwater flow through various geological formations to portray the 2/3/4D of the subsurface and aquiferous zones. MLU software has been used in Aquifer and Pump Test Analysis. Useful for quickly estimating aquifer properties such as layer-by-layer transmissivity, Storativity, and vertical resistance/conductance based on aquifer testing data, and efficiently incorporating these properties into numerical groundwater flow models for advanced subsurface modelling using MODFLOW software etc.
7. Water Resources Assessment- Done to determine the viability of a project as far as supply of water from the source to the tanks and water points.
8. Borehole Condition Assessment - Done on problematic existing boreholes to investigate the course of such problems and the way forward to solve the problems or recommend alternatives to supplement the water supply etc.
9. Groundwater Monitoring -Done to determine water quality and quantity of an aquifer over time hence to advice on pumping regimes.

Real Estate Development and Groundwater Resources

Any property buyer or developer should always seek professional guidance on groundwater resources, water potential and quality found in a specific project region, as well as water demand for the present or future requirement for the land being sought.

With our extensive knowledge in groundwater resources throughout Kenya and the Eastern African Region, we have advised and continue to advise numerous land purchasers or developers, both individual and corporate, in this regard, which has proven to be extremely beneficial to many. Some clients even reduce down to a few plots of land and then seek our professional advise on the best plot to buy out of all the pre-selected plots.

Buying a piece of property in a location with no groundwater potential or with low potential, regardless of how cheap the land is, can be a disappointing purchase if borehole drilling is a component in the overall development, either now or in the future.

Borehole Drilling Supervision and Management

1. Assist clients in the process of applying for necessary borehole drilling permits/authorization letters/ licenses from the Water Resources Authority (WRA) and National Environmental Management Authority (NEMA) to enable drilling to commence.
2. Preparation of Drilling Technical Specifications, borehole drilling Bill of Quantities (BOQs), conditions of borehole drilling contract, drilling tendering and tender evaluation
3. Supervision of Borehole Drilling and construction/installation works, Development, Test Pumping and installation of permanent pumping plants.
4. Analysis of test Pumping data and selection of suitable borehole pumps for installation,
5. Inspection of contractor's work and Certification of contractor's Bill of Quantities (BOQs)
6. Geological and Geophysical logging
7. Water quality assessment and monitoring.
8. Preparation of borehole drilling and completion reports, etc.

+ *Borehole Condition Assessments and Hydrogeological Evaluation*

This is done on existing boreholes to investigate the courses of failure and the way forward to solve the problems or recommend alternatives to supplement the water supply among other pertinent recommendations.

Aspects evaluated include: -

- i. Borehole design and installations,
- ii. Original and current borehole depth and water levels,
- iii. Borehole water quality and hydrochemistry, water quantity,
- iv. Borehole location and its geological logs,
- v. Abstraction trends,
- vi. Type and capacity of installed permanent pumping plants,
- vii. Permanent pump intake levels, frequency of the installed pump failures,
- viii. Borehole density and abstraction trends in the neighborhood, evaluation of area's hydrogeology and aquifer conditions,
- ix. Client's water demand over the years and daily pumping regimes,
- x. Available initial and subsequent test pumping data,
- xi. Aquifer lithology,
- xii. Aquifer mineral chemistry,
- xiii. Geological setting and groundwater recharge/discharge mechanisms,
- xiv. Saline water intrusion (in coastal belts),
- xv. Hydrology and land use,
- xvi. Climatology

+ *Environmental Audits (EA)*

We carry out EA on existing projects and ongoing projects to emphasize the implementation of the EMMPs.

+ *Environmental Impact Assessment (EIA)*

EIA Project Reporting for borehole drilling projects, EIA Study Reports and ESIA in accordance with the NEMA requirements. Teaming up with other EIA/EA Lead experts in execution of bulk EIA study reports especially in projects where more than one expert is required.

+ *Geological surveys/ Assessment*

Assessment of geological setting of a project area and its control on land use, settlement patterns, livelihoods and resultant ecosystems. Evaluation of aspects such as lithology, petrology, structural geology, mineralogy, economic geology, geological history and timescale, stratigraphy, geomorphology, soils, vegetation, wetlands, drainage and paleo-channels, Agro minerals, hydrogeology, water quality, climatology and paleo-climates, oceanography (for coastal projects), assessment/ analysis of geological logs and geophysical logs, assessment/interpretation of satellite images and geological maps.

+ *Geotechnical surveys*

Done to determine suitability for foundations of various engineering works, e.g., foundations, road construction, dam construction, injection boreholes, construction of infiltration galleries for subsurface storage of water in some geological terrains, in including depth to bedrock surveys, rock profiling and geo-tomography by use of resistivity and induced polarization methods.

+ *Hydrological surveys/ Assessment*

A study done on a particular surface water body e.g., a river, stream, spring, etc. for purposes of exploiting the resource. For instance, purposes such as direct water abstraction for domestic/industrial/irrigation or any other use, hydroelectric power production, dam design/construction and reservoir management, flood control and management, drought management, water resources assessment, groundwater recharge estimation, water body diversion during engineering

works or for any other undertaking which may be done on the resource or may affect the resource as a result of implementation of a proposed development project.

✚ *Water Quality Assessment and Monitoring*

Monitoring of both groundwater and surface water resources from the available water points, boreholes, surface water bodies, geological and hydrogeological settings, etc. for purposes of qualitatively determining exploitable water resources in a given area or for purposes of pre-determining any precautionary measures/ remedies (if any) needed when one intends to exploit or invest on the available water resources.

✚ *Water Resources Assessment and Management*

Evaluation of surface and groundwater resources, assessment of groundwater and surface water availability with regard to available resources in a given project area, existing abstractors, existing water abstraction structures/modes, water balance, water quantity and quality, viable modes of exploiting the available resources and water resources conservation and management etc.

✚ *Borehole Camera Scanning Services*

This involves a perfect High-definition color scanning system along with DVD recording. Scanning can be done up to 300m. A review of the borehole from an experience expert. The results from the scanning process are used to determine the current condition of the borehole including any problems with the borehole.

EAST AFRICA PROJECTS

Detailed Tasks	Reference to Prior Work/Assignments on Water & Environmental- Related Projects
16 No. boreholes & Environmental Impact Assessment	<p>Year: Sept-Date, 2021 Location: Sailoni, Maziwa, Furaha Dzifahe, Ngao Sec. Sch., Vumbwe, Ngavia, Tana Delta Sub-County, Kenya Client: Tana River Self Help Groups Main project features: Environmental Impact Assessment (Summary Project Report) Assessment review, Hydrogeological & Geophysical Survey, and 16 No. shallow Borehole drilling and construction supervision for community water supply. Activities performed: Field planning, supervision, and data analysis and reporting.</p>
4 No. boreholes & Environmental Impact Assessment	<p>Year: June-Sept, 2021 Location: Nduru 'B', Itsowe, Sailoni, & Chira, Tana River County, Kenya Client: Tana River Self Help Groups Main project features: Environmental Impact Assessment (Summary Project Report) Assessment, Hydrogeological & Geophysical Survey, and 4 No. shallow Borehole drilling and construction supervision for community water supply. Activities performed: Field planning, supervision, and data analysis and reporting.</p>
Environmental Auditing (EA) for a hostel block in Ongata Rongai	<p>Year: June, 2021 Location: Ongata Rongai, Kajiado County, Kenya Client: Hostels Kenya Ltd Main project features: Environmental Auditing (Incl. assess the level of compliance with the approved environmental management plan formulated during project implementation and sound environmental management systems and practices). Activities performed: Observations, questionnaires, inspections and interviews on environmental performance and health and safety aspects and meeting the occupants and management to ascertain compliance.</p>
Hydrogeological & Geophysical Survey and Environmental Impact Assessment for 1 No. Borehole	<p>Year: June, 2021 Location: Garsen, Tana River County. Client: Coast water works Development Agency through Access link ltd Main project features: Environmental Impact Assessment for 1 No. Borehole and Hydrogeological and geophysical study. Main activities: Desk study, field inventory, water resources assessment, geophysical investigation and borehole site recommendation for the production</p>

Hydrogeological & Geophysical Survey and Environmental Impact Assessment for 1 No. Borehole	<p>Year: June, 2021 Location: Kamulu, Machakos County. Client: Carol Nthenya Musembi Main project features: Environmental Impact Assessment for 1 No. Borehole and Hydrogeological and geophysical study. Main activities: Desk study, field inventory, water resources assessment, public participation, geophysical investigation and borehole site recommendation for the production</p>
Hydrogeological & Geophysical Survey & Environmental Impact Assessment (Summary Project Report-SPR) -5 shallow wells	<p>Year: March-June, 2021 Location: Bandi, Itsowe, Gamba, Bula Rahma, & Mwangaza, Tana River County, Kenya Client: Tana River Women Help Groups Main project features: Hydrogeological & Geophysical Survey, EIA (Summary Project Report) Assessment review, and 5 No. shallow Borehole drilling and construction supervision for community water supply. Activities performed: Field planning, supervision, and data analysis and reporting.</p>
Groundwater survey, Supervision & Environmental Impact Assessment	<p>Year: January, 2021 Location: Marikebuni, Kilifi County, Kenya Client: Galana Boys High School Main project features: Geophysical Survey, Environmental & Social surveys, EIA Assessment, 1 No. Borehole drilling and construction supervision Positions held: <i>Groundwater Resources & Environmental Specialist</i> Activities performed: Field planning, supervision, and data analysis and reporting.</p>
Environmental Auditing (EA) for an office block in Westland	<p>Year: Dec, 2020 Location: Westland, Nairobi County, Kenya Client: Mugoiri House Ltd Main project features: Environmental Auditing (Incl. assess the level of compliance with the approved environmental management plan formulated during project implementation and sound environmental management systems and practices). Activities performed: Observations, questionnaires, inspections and interviews on environmental performance and health and safety aspects and meeting the occupants and management to ascertain compliance.</p>
Drilling Supervision	<p>Year: April-August, 2020 Location: Kakuma, Turkana County, Kenya Client: Nakoyo and St. Brigid's Community Schools Main project features: 2 No. Borehole drilling and construction supervision, construction supervision Activities performed: Field planning, supervision, data analysis and reporting.</p>
Groundwater assessment Study for large scale production of peanuts	<p>Year: March-April 2020 Location: Kakuma and Kalobeyei, Turkana County, Kenya Client: Deltares, The Netherlands Main project features: Feasibility study on Groundwater for Groundnut production. Activities performed: Field planning, desk study, field investigations and reporting.</p>
Hydrogeological and Geophysical Studies and Environmental Impact Assessment for water supply project	<p>Year: March 2020 Location: Oloitokitok, Kajiado County. Client: Kenya Assemblies of God Main project features: Environmental impact assessment, Hydrogeological and geophysical study. Main activities: Desk study, field inventory, water resources assessment, geophysical investigation and borehole site recommendation for the production</p>
Hydrogeological and Geophysical Studies & Environmental Impact Assessment	<p>Year: Feb- March 2020 Location: Southern Sudan Client: World Vision Sudan Main project features: Environmental impact assessment, Hydrogeological, geophysical survey and EIA for two (2) boreholes in Aweil North County and two (2) in Aweil East County in Northern Bahr El Ghazal State of Southern Sudan. Activities performed: Field planning, desk study, field investigations and reporting</p>

Hydrogeological and Geophysical Studies & Environmental Impact Assessment for water supply project	<p>Year: February 2020 Location: Kisaju, Kajiado County. Client: RBK Limited Partnership Main project features: Environmental impact assessment, and Hydrogeological and geophysical study. Main activities: Desk study, field inventory, water resources assessment, geophysical investigation and borehole site recommendation for the production.</p>
Groundwater Assessment Study and Environmental Impact Assessment.	<p>Year: August-November 2019 Location: BeleBele Catchment, Lamu. Client: Kenya Red Cross Main project features: Groundwater Assessment Study. Main activities: Desk study, field inventory, water resources assessment, geophysical investigation and borehole site recommendation for the production.</p>
Hydrogeological and Geophysical Studies and Environmental Impact Assessment	<p>Year: September 2019 Location: Lavington, Nairobi Client: Mr. David Cururu Wangunyu Main project features: Hydrogeological & geophysical study, Environmental impact assessment. Main activities: Desk study, field inventory, water resources assessment, Environmental impact assessment, geophysical investigation and borehole site recommendation for the production.</p>
Hydrogeological and Geophysical Studies and Environmental Impact Assessment for water supply project.	<p>Year: August 2019 Location: Wajir East Client: Ministry of Water and Sanitation Main project features: Hydrogeological and geophysical study, Environmental impact assessment. Desk study, field inventory, water resources assessment, geophysical investigation and borehole site recommendation for the production.</p>
Hydrogeological and Geophysical Studies and Environmental Impact Assessment for water supply project.	<p>Year: August 2019 Location: Wajir South-Abore Client: Ministry of Water and Sanitation. Main project features: Hydrogeological and geophysical study, Environmental impact assessment. Desk study, field inventory, water resources assessment, geophysical investigation and borehole site recommendation for exploratory drilling.</p>
Hydrogeological and Geophysical Studies and Environmental Impact Assessment for water supply project.	<p>Year: July 2019 Location: Dagoreti South Client: Nairobi Business Park (WTC) Main project features: Environmental impact assessment, Hydrogeological and geophysical study. Desk study, field inventory, water resources assessment, geophysical investigation and borehole site recommendation for the proposed Business centre.</p>
Groundwater Assessment Study & Environmental Impact Assessment	<p>Year: April 2018- June, 2020 Location: Wajir County Client: Ministry of Water and Sanitation Main project features: Ground Water Assessment-Hydrogeological, Environmental impact assessment, geophysical and water quality investigations. Desk study, field inventory, water resources assessment, geophysical investigations for 74 No. Borehole</p>
Hydrogeological and Geophysical Studies and Environmental Impact Assessment	<p>Year: February 2019 Location: Kiserian Client: Mr. John Bernard Nthuku Main project features: Hydrogeological and geophysical study. Desk study, field inventory, water resources assessment, Environmental impact assessment, geophysical investigation and borehole site recommendation for the domestic use.</p>
Hydrogeological and Geophysical Studies & Environmental Impact Assessment	<p>Year: February 2019 Location: Kangemi Client: Mr. Samuel Njuguna Kimani Main project features: Environmental impact assessment, Hydrogeological and geophysical study. Desk study, field inventory, water resources assessment, geophysical investigation and borehole site recommendation for the proposed mall.</p>

Hydrogeological and Geophysical Studies and Environmental Impact Assessment	<p>Year: October 2018 Location: Kiserian Client: Mr. Peter Mbogo Main project features: Environmental impact assessment, Hydrogeological and geophysical study. Desk study, field inventory, water resources assessment, geophysical investigation and borehole site recommendation for the domestic use.</p>
Hydrogeological and Geotechnical site investigations, Environmental Impact Assessment for water supply project.	<p>Year: May 2018 Location: Narok (Pinying, Sogoo and Olopikidong'oe) Client: LUJO consulting Engineers Main project features: Environmental Impact Assessment for water supply project and Hydrogeological / geophysical and Geotechnical site investigations study. Desk study, field inventory, water resources assessment, trial pit, geophysical investigations for 2 No. Dams and 1No. Borehole.</p>
Hydrogeological and Geophysical Studies and Environmental Impact Assessment for water supply project.	<p>Year: March 2018 Location: Magadi Client: Aurecon- Kenya Office Main project features: Environmental Impact Assessment for water supply project, Hydrogeological and geophysical study. Desk study, field inventory, water resources assessment, geophysical investigation and borehole site recommendation for the proposed community water project.</p>
Borehole Drilling Supervision	<p>Year: December 2017 Location: Kawangware, Nairobi County Client: Geoffrey Wandeto Main project features: Borehole drilling and construction supervision. Water for domestic use. Activities performed: Field planning, desk study, well logging, borehole construction supervision test pumping supervision and reporting</p>
Borehole Drilling Supervision	<p>Year: May-August 2017 Location: Kakuma, Turkana County, Kenya Client: Kenya Red Cross Society (KRCS) Main project features: Borehole drilling and construction supervision for the Kalobeyi Refugee Settlement Activities performed: Field planning, borehole drilling supervision, data analysis and reporting</p>
Hydrogeological and Geophysical Studies and Environmental Impact Assessment	<p>Year: August 2016 Location: Bungoma County, Kenya Client: County Government of Bungoma Main project features: Environmental Impact Assessment for water supply project, Hydrogeological and geophysical study. Desk study, field inventory, water resources assessment, geophysical investigation and borehole site recommendation for the proposed water project for commercial and domestic use.</p>

TEAM

GroundwatCH Global Limited has a qualified and widely experienced team of professionals who are capable of meeting clientele expectations. They are involved from managing projects from inception to completion and reporting.



DAN KIBET KISO

Managing Director and Principal Consultant:

Groundwater Resources Specialist & EIA/EA Associate Expert: M.Sc. Tropical Hydrogeology & Environmental Engineering- Technische Universität Darmstadt, Germany, BSc. (Geology) - South Eastern Kenya University, Post. Graduate certificate in EIA/EA - Africa Nazarene University, registered and licensed EIA/EA expert with NEMA-Kenya, Professional member of Geological Society of Kenya, Registered Water Professional with the ministry of Water, Sanitation and Irrigation, Registered Professional Geologist with Geologist Registration Board, Member of International Association of Hydrogeologists, registered associate member of Environmental Institute of Kenya. He has over 5 years' experience in various aspects of applied hydrogeology, hydrology, geology, exploration geophysics and hydrochemistry, environmental impact assessment (EIA), environmental and social impact assessment (ESIA) and environmental audit (EA), water, sanitation and hygiene (WASH) projects, project evaluation and management, water resources assessments. He has vast experience in the East African region especially in Kenya, Somalia.

Mr. Dan has worked for renowned companies like Earth Water Limited, Everesta Water Limited and International NGO like Team & Team International incl. the county government of Bungoma. He has conducted numerous projects for a wide scope of clients such as individual clients, private organizations/companies, local/international NGO's and major government projects.

Mainly involved in hydrogeological/geophysical site surveys, borehole site investigations, hydrological surveys, Environmental Impact Assessment and Environmental Audit studies, aquifer studies, Water Resources Assessment, water quality monitoring & assessment, Water Availability Studies, water supply project management from inception to completion, borehole drilling supervision on behalf of clients (i.e. Project proposal formulation, preparation of borehole drilling technical specifications and Bill of Quantities, drilling tendering/tender evaluation, drilling supervision, borehole logging, design and installation, supervision of test pumping process, selection of pumps, certification of contractor's Bill of Quantities etc.).

Borehole Condition assessment, water quality assessment, geotechnical surveys/studies and Engineering Geological surveys, evaluation of small scale to large scale water supply and sanitation projects including WASH projects. Design and Evaluation of Ground and Surface Water supply and Sanitation Projects, Design and installation of injection boreholes for industrial effluents discharge.

The staff of GroundwatCH Global Limited are experienced hydrogeologists, geophysicists, Environmentalists, hydrologists, groundwater inspectors, EIA/EA Lead Experts and water engineers.

They are well experienced in the use of various geophysical equipment used in groundwater and geotechnical surveys such as ABEM Terrameter SAS 1000/4000, Electromagnetic Method (EM), Electrical Resistivity Tomography (ERT), Audio-Magnetotellurics (AMT). Knowledgeable and skilled in the execution and interpretation of geophysical measurement techniques such as geo-resistivity, Schlumberger vertical electrical soundings (VES), Induce polarization (IP), and Wenner Resistivity Profiling to detect anomalies of decomposed lithologic units, geological lineaments etc. or saline shallow aquifer zones in coastal belts and elucidate the geological successions of aquifers.

The core team is well experienced in use of computer softwares in groundwater-modelling, Geophysical interpretation programs: Interpex IX1D, Schlumberger, IPWIN, Rockworks, MODFLOW etc. Borehole design, geological and geophysical logging, and test-pumping software: Aquifer and Pump Tests.

Drilling Project Management which entails borehole/well design and construction, geological logging, test pumping analysis, pump selection and installation, certifying contractor's Bill of Quantities, borehole/well condition assessment and rehabilitation, Tendering and Tender evaluation.