




Occupational Qualification Document

Occupational Code	Qualification Title		NQF Level	Logo
862927	National Occupational Certificate: Borehole Pump Operator		4	
	Name	Email	Phone	Logo
Development Quality Partner	Energy and Water Sector Education and Training Authority (EWSETA)	leshas@ewseta.org.za	011-2744700	
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Assessment Quality Partner	Energy and Water Sector Education and Training Authority (EWSETA)	leshas@ewseta.org.za	011-2744700	

DQP Representative Signature

Date

QUALIFICATION DETAILS

Qualification Title: National Occupational Certificate: Borehole Pump Operator

Occupational Code: 862927

Quality Assuring Body: Quality Council for Trades and Occupations (QCTO)

Sub Framework: Occupational Qualifications Sub-Framework

Field: Field 06 – Manufacturing, Engineering and Technology

Subfield: Engineering and Related Design

NQF Level: 4

Credits: 180

Originator/Development Quality Partner (DQP): EWSETA

Quality Partner (AQP): EWSETA

Qualification Type: National Occupational Certificate

Registered qualifications and or learning programmes to be replaced:

- None

RATIONALE:

Climate change continues to negatively affect the availability of both groundwater and surface water contributing to water shortage/scarcity globally. This affects the livelihoods, human wellbeing both in urban and rural settings, food security and industries in the economy throughout the country. The communities especially in the rural areas are experiencing water shortages and depend on wells which are not sustainable. Policy-makers and other key role-players in the water sector are increasingly looking for ways to achieve sustainable supply and access to water resources to meet the basic human right and industry needs hence groundwater forms an important life sustaining resource that most rural communities depend on including major sectors in the economy such as mining and agriculture.

Currently there is limited accessibility to groundwater resources in most areas due to non-functionality of the available groundwater infrastructure as a result of vandalism, hence the need for the qualification to provide knowledge and technical skills to individuals to operate and maintain borehole infrastructure which will promote socio-economic progress in the country benefiting the communities in terms of human health and industries utilising groundwater resources in their operations thus creating the economic welfare of the country.

Currently there are no similar qualifications registered on the National Qualifications Framework (NQF). This qualification is therefore designed to provide learners with requisite knowledge skills, values and attitudes to operate and maintain borehole pumps to ensure optimal performance and meet constant supply of water to the various users at this level. Qualifying learner will be able to operate and maintain groundwater infrastructure. No licensing or membership requirements apply to this qualification at the time of development.

The qualification is intended for those who wish to start a career as borehole pump operators as well as process controllers, learners who have obtained civil engineering NATED programmes as well as those who have acquired knowledge, expertise and experience in groundwater abstraction operating the borehole pumps in the real-life work environment but do not have formal qualification. Qualifying learners will gain employment opportunities at government levels (national, provincial and local) as well in private homes, business or become self-employed.

This qualification also allows career pathing to qualifying learners to articulate vertically and horizontally in water related qualifications to practice an occupation as process controllers, technicians and technologists.

PURPOSE

The purpose of this qualification is to prepare a learner to operate as a Borehole Pump Operator

A Borehole Pump Operator prepares, operates, inspects, measures, samples, tests, installs, adjusts, monitors, records and maintains a borehole pump to transfer groundwater to treatment plant or reservoir to residential, commercial, and industrial establishments for safe drinking and other uses in accordance with safe working instructions, principles and best practice.

A qualified learner will be able to:

- Operate and maintain groundwater abstraction system/borehole pump
- Monitor and evaluate groundwater abstraction system performance and its related equipment
- Perform fault-finding and troubleshooting
- Build and maintain relationships with stakeholders

RULES OF COMBINATION

This qualification is made up of compulsory Knowledge, Practical Skills and Work Experience Modules

Knowledge Modules:

- 862927-000-00-KM-01- Workplace Fundamentals, NQF Level 3, 2 Credits
- 862927-000-00-KM-02- Legislation, regulations and Safety standards, NQF Level 4, 2 Credits
- 862927-000-00-KM-03- Communication and Administration, NQF Level 4, 9 Credits
- 862927-000-00-KM-04- Water Cycle, NQF Level 4,5 Credits
- 862927-000-00-KM-05- Groundwater abstraction data collection, NQF Level 4, 5 Credits
- 862927-000-00-KM-06- Operation and Maintenance of groundwater abstraction system, NQF Level 5, 20 Credits
- 862927-000-00-KM-07- Groundwater Monitoring System, NQF Level 4, 3 Credits
- 862927-000-00-KM-08- Environment, Energy Efficiency and Environmental Ethics, NQF Level 4, 2 Credits
- 862927-000-00-KM-09- Stakeholder Engagement, NQF Level 4, 2 Credits

Total number of credits for Knowledge Modules: 50

Practical Skills Modules:

- 862927-000-00-PM-01- Prepare for and operate groundwater abstraction system, NQF Level 4, 10 Credits
- 862927-000-00-PM-02- Monitor, control and measure water levels, abstraction, power usage, water quality and quantity, NQF Level 4, 15 Credits
- 862927-000-00-PM-03- Conduct groundwater quality monitoring, sampling and on-site testing, NQF Level 3, 5 Credits
- 862927-000-00-PM-04- Perform routine inspection on groundwater abstraction system performance, NQF Level 4, 5 Credits
- 862927-000-00-PM-05- Perform basic groundwater abstraction system maintenance, fault-finding and troubleshooting, NQF Level 4, 15 Credits
- 862927-000-00-PM-06- Participate in relevant stakeholder forums meetings, NQF Level 4, 3 Credits

Total number of credits for the Practical Skills component: 53

Work Experience Modules:

- 862927-000-00-WM-01- Groundwater abstraction operation and maintenance processes, NQF Level 4, 20 Credits
- 862927-000-00-WM-02- Groundwater abstraction system perform monitoring and reporting processes, NQF Level 4, 20 Credits
- 862927-000-00-WM-03- Processes of groundwater water quality monitoring, sampling and on-site testing, NQF Level 3, 8 Credits
- 862927-001-00-WM-04- Processes of monitoring and evaluation of the groundwater abstraction system performance and its related equipment, NQF Level 4, 10 Credits
- 862927-001-00-WM-05- Groundwater abstraction maintenance, fault-finding and troubleshooting processes, NQF Level 4, 15 Credits
- 862927-001-00-WM-06- Processes of stakeholder engagement on groundwater supply, NQF Level 4, 4 Credits

Total Number of credits for the Workplace Experience component: 77

ENTRY REQUIREMENTS

- NQF Level 2

EXIT LEVEL OUTCOMES AND ASSOCIATED ASSESSMENT CRITERIA

Exit Level Outcome 1

Monitor, evaluate and operate groundwater abstraction system for optimal performance

Associated Assessment Criteria

- Activity-based risk assessment is conducted and potential risks on groundwater abstraction site are identified and mitigated in line with standard operating procedures
- Groundwater abstraction system is operated, maintained, monitored and evaluated to ensure optimal operational performance
- Groundwater abstraction system is checked using correct instruments and equipment, and measures in response to system malfunctioning, over-abstraction and pollution are implemented to ensure effective functioning according to system operation manual and organisational standard operating procedures

Exit Level Outcome 2

Perform basic maintenance and troubleshooting on groundwater abstraction system

Associated Assessment Criteria

- Groundwater abstraction system components are correctly identified in terms of their features and functions
- Different types of maintenance to be carried out on groundwater abstraction system are identified and explained in terms of their applicability
- Potential faults that may occur on groundwater abstraction system are correctly identified, and correct troubleshooting techniques are applied to rectify system breakdown
- Groundwater system infrastructure is monitored and evaluated using system indicators to ensure proper functioning and optimal performance

Exit Level Outcome 3

Analyse and apply stakeholder engagement techniques to build trust and maintain relationships

Associated Assessment Criteria

- Type of information and reasons to inform stakeholders on groundwater abstraction system performance are identified and explained with examples
- Information provided during stakeholder engagement event is relevant and risk communication principles are applied when sharing groundwater abstraction system-related matters to promote trust and positive relationships between the stakeholders and the organisation
- Common concerns/problem relating to groundwater abstraction affecting the communities are analysed, identified and reported to the relevant person to determine the required action

INTERNATIONAL COMPARABILITY

Benchmarking was conducted against international qualifications, courses or learning programmes relating to borehole or groundwater abstraction/extraction from Australia and United States of America (USA). The comparison in the USA indicates best practice in the industry as other countries offer qualifications of groundwater abstraction/extraction at tertiary or degree level targeting professionals such as water engineers and supervision teams in borehole construction only.

Australia

Water Training Australia

NWP30219 Certificate III in Water Operations

The Water Training Australia is a Registered Training Organisation regulated by the Australian Skills Quality Authority (ASQA). The organisation delivers nationally recognised water related qualifications predominantly to Water and Mining Industries across Australia. The NWP30219 Certificate III in Water Operations is an entry level qualification aimed at Groundwater Extraction Operators (Groundwater Operators) engaged in water industry operations to apply operational and procedural practices under supervision.

The qualification is comprised of 23 units of competency and learners are required to obtain at least 11 units of competency to achieve the qualification (i.e 2 core units and 9 elective units with appropriate contextualisation contributing to the vocational outcome). The qualification is similar to the South African qualification in terms of target group as it is aimed at water industry operators who need hands-on technical and operational competencies including groundwater abstraction, and content although structured differently as it is comprised of core and elective unit of competency offering strands for specialisations in networks, water sources, irrigation and the treatment of water.

This qualification, however, differs with the South African qualification in terms of level, duration, and credits as the information is not provided. Also, this qualification differs with the South African qualification in that there are no entry requirements for this qualification as opposed to the South African qualification that has minimum entry requirements to enable the learner to cope with the learning.

The units of competency that compare favourably with the South African qualification include:

- BSBWHS201 Contribute to health and safety of self and others (Core)
- NWPGEN018 Follow environmental and licensing procedures (Core)
- NWPCAD019 Monitor and operate groundwater extraction(Elective)
- NWPGEN027 Monitor and operate pump stations(Elective)
- BSBOPS203 Deliver a service to customers(Elective)
- BSBPEF202 Plan and apply time management(Elective)
- BSBWHS311 Assist with maintaining workplace safety(Elective)
- CPCCOM1015 Carry out measurements and calculations(Elective)
- FSKDIG003 Use digital technology for non-routine workplace tasks(Elective)
- NWPGEN017 Apply the risk management principles of the water industry standards, guidelines and legislation(Elective)
- NWPGEN024 Identify the role and functions of the water industry(Elective)
- RIIWHS201E Work safely and follow WHS policies and procedures(Elective)
- UEECD0007 Apply work health and safety regulations, codes and practices in the workplace(Elective)
- RIIWHS202E Enter and work in confined spaces(Elective)
- NWPGEN020 Sample and test source or drinking water(Elective)
- NWPGEN021 Sample and test wastewater(Elective)
- NWPGEN023 Use maps, plans, drawings and details(Elective)
- NWPCAD002Control vegetation on a site(Elective)
- NWPNET019 Prepare and restore worksite(Elective)
- NWPNET038 Install metering equipment(Elective)
- TLIF2010 Apply fatigue management strategies(Elective)
- UEERE0019 Maintain safety and tidiness of remote area power supply systems(Elective)
- UEECD0007 Apply work health and safety regulations, codes and practices in the workplace(Elective)

United States of America (USA)

Tarrant County College

Water Operator-Ground

The Tarrant County College is accredited with Texas Commission on Environmental Quality (TCEQ) offering a certificate programme designed for Groundwater Operators aimed at providing learners with technical knowledge to competently perform in the water and wastewater utility industry as Groundwater Operators. The programme is similar to the South African qualification in terms of content and structure as learners are required to undergo internship or work experience in the South African context.

The programme differs with the South African qualification in terms of qualification type as it a non-credit (continuing education) programme which leads to certification and industry-recognised credentials, and the duration of 404 hours for the knowledge component. The programme also differs with the South African qualification as the minimum entry requirements for this programme is not provided as opposed to the South African qualification that has minimum entry requirements to enable the learner to cope with the learning. Furthermore, the programme differs with the South African qualification as qualifying learners must be licensed to operate as Groundwater Operators and the licensing requirements for the programme are categorised in different classes, namely, Class A, B, C, and D respectively. Learners successfully completing the knowledge component of the programme will be issued with a Certificate of Completion and will be eligible to apply and undertake Class B (Groundwater Operators) TCEQ licensing exam to be assessed on other subjects focusing on skills and internship to be licensed to operate whereas qualified Borehole Pump Operators in South Africa do not require a license to operate.

The course content for Knowledge and skills includes:

- Types of wells
- Well hydraulics
- Well development
- Well maintenance
- Pump operation and ground water treatment
- Physical and chemical characteristics of ground water
- Disinfection
- Pumps and motors
- Storage and distribution
- Water Exam Prep
- Basic Water Works Operations
- Groundwater Production

- Water Utility Safety
- Water Laboratory
- Internship 1 Water
- Internship 2 Water
- Internship 3 Water
- Water Utility Calculations

Conclusion:

The countries searched reveal that the qualification in Australia and USA certificate programme compare favourably with the South African qualification in terms of content and that USA is regarded as best practice in the industry.

INTEGRATED ASSESSMENT

Integrated Formative Assessment

The skills development provider will use the curriculum to guide them on the stipulated internal assessment criteria and weighting. They will also apply the scope of practical skills and applied knowledge as stipulated by the internal assessment criteria. This formative assessment together with work experience leads to entrance in the integrated external summative assessment.

Qualifying for External Assessment

In order to qualify for an external assessment, learners must provide proof of completion of all required modules by means of a statement of results and statement of work experience as well as proof of successful completion of the following subjects and modules or alternative programmes where applicable.

Integrated Summative Assessment

An external integrated summative assessment, conducted through the relevant QCTO Assessment Quality partner is required for the issuing of this qualification. The external integrated summative assessment will focus on the exit level outcomes and associated assessment criteria. The assessment will be conducted through written assessment and the evaluation of practical tasks at decentralised approved assessment sites by a panel of assessors evaluated by assessor(s) registered with the AQP within a period of two (2) days.

RECOGNITION OF PRIOR LEARNING (RPL)

- a) Learners will gain access to the qualification through RPL for Access as provided for in the QCTO RPL Policy. RPL for access is conducted by accredited education institution, skills development provider or workplace accredited to offer that specific qualification/part qualification.
- b) Learners who have acquired competencies of the modules of a qualification or part qualification will be exempted from modules through RPL.
- c) Learners will be awarded credits for or towards the qualification or part qualification through RPL as provided in the QCTO RPL Policy. RPL for credits provides for the formal award of credits for, or towards a qualification or part-qualification registered on the NQF.
- d) RPL for access to the external integrated summative assessment: Accredited providers and approved workplaces must apply the internal assessment criteria specified in the related curriculum document to establish and confirm prior learning. Accredited providers and workplaces must confirm prior learning by issuing a statement of result or certifying a work experience record

ARTICULATION

Horizontal

This qualification articulates horizontally with the following qualification:

- Further Education and Training Certificate: Water Purification Processes, NQF Level 4

Vertical

This qualification articulates vertically with the following qualification:

- Occupational Certificate: Mechatronics Technician, NQF Level 5

NOTES

Additional legal or physical entry requirements:

- None

Criteria for the accreditation of providers

Accreditation of providers will be done against the criteria as reflected in the relevant curriculum on the QCTO website.

The Curriculum Title and Code: Borehole Pump Operator: 862927-000-00-00

This qualification covers the following trades as recorded on the NLRD:

- This is not a trade.

QUALITY PARTNER (QP)

Energy and Water Sector Education and Training Authority (EWSETA)

DERIVED QUALIFICATIONS REGISTERED AS PART QUALIFICATIONS

- None