



**NICHOLAS
O'DWYER**
an **RSK** company

**WATER
SECTOR**

CAPABILITY STATEMENT

'Engineering Project of the Year 2018' Engineers Ireland
'Civil Engineering Project of the Year' ICE
'Global Water Project of the Year 2019' *Shortlisted*

Water Sector *Capability Statement*

Water is life. It is essential to our daily lives, and key to successful economies worldwide. Yet over one billion people do not have access to clean water; and those economies that have a safe clean supply are ever challenged by the need for greater efficiencies and increasing demands.



Nicholas O'Dwyer implements and maintains a management system which fulfills the requirements of the standard
IQNET ISO 9001:2015
Registration Number: IE-19.3077HQ



NSAI

Certificate of Registration
of Occupational Health and Safety
Management System to
I.S. ISO 45001:2018



NSAI

Certificate of Registration
of Environmental Management
System to I.S. EN ISO 14001:2015



NSAI

Certificate of Registration
of Quality Management System
to I.S. EN ISO 9001:2015



Water Sector

Capability Statement

Nicholas O'Dwyer has successfully delivered water resource management and water supply projects across the global economy for over 90 years. Having worked with all of the international funding agencies on substantial projects in developing countries, the firm has earned its reputation as an innovator and leader in the field of construction design, procurement and management of major infrastructural projects at home and abroad.

It's expertise ensures that clients are well positioned to take advantage of the latest technologies, methodologies and industry trends to provide sustainable solutions for the management of this valuable natural resource.

The firm's European and International clients include local and multi-national contractors, government departments, statutory bodies, private sector organisations, utility providers and International Funding Institutions (IFIs) responsible for funding and coordinating major infrastructure projects.

Since its inception, Nicholas O'Dwyer has forged strong links with engineering firms across the globe which allows the firm to bring together local knowledge and international expertise.

This ensures our clients' needs are truly understood and the best fitting solutions are delivered, using the most innovative technology.

We have delivered hundreds of water, civil, transport, and environmental projects in more than 50 countries.

During the past 15 years alone we have:

- *Provided water services to over 10 million consumers;*
- *Delivered water sector projects with a construction value of over €3 billion;*
- *Provided over 3 million man-hours of engineering services to the water industry;*
- *Worked in over 20 countries throughout the developing world;*
- *Developed a strong track record in the delivery of projects funded by IFI's;*
- *Extensively used the conditions of contract of these agencies including the FIDIC Conditions of Contract.*

Our team prides itself on a 'can do' approach delivered through sound management, technical excellence and teamwork.

“Successfully delivering water resource management and water supply projects across the global economy for over 90 years”



Water Sector

Our Service

The firm consistently delivers the technical and organisational expertise to engineer innovative and affordable solutions in water supply while successfully managing the stringent regulatory requirements which govern water quality. We provide a full suite of engineering services for planning, design and implementation, establishing best practices in the following areas:

Water Resources, Planning & Management

Assisting clients in planning and managing urban and regional water supplies, Nicholas O'Dwyer provides services relating to catchment hydrology; river basins; groundwater and aquifers; strategic planning of water supply and distribution systems; water abstraction and irrigation.

Water Treatment

Our engineers develop efficient designs for water treatment plants including water quality analysis; options assessment of different treatment processes; development and monitoring of pilot plants; detailed design of treatment facilities including process, civil, building and mechanical and electrical systems engineering.

Water Storage

Our expertise includes a wide spectrum of storage facilities notably dams, reservoirs, concrete water retaining structures and water towers which are engineered to ensure security of water supply and operational flexibility.

Water Transmission and Distribution

Our team provide comprehensive services across a wide range of transmission and distribution systems. This encompasses all elements of the distribution system to transmit water to end-users and includes water transmission pipelines, hydraulic structures, pump stations and distribution infrastructure.

Water Supply Management

The firm provides all aspects of water supply management advisory and consultancy services to water utilities, including water usage studies, operation efficiency studies, water conservation leakage reduction programs; metering and billing projects and institutional strengthening and capacity building initiatives.

Our team's range of engineering and technical services include:

- *Master planning;*
- *Technical and economic feasibility studies;*
- *Environmental impact assessments;*
- *Project development planning;*
- *Design;*
- *Risk management assessment;*
- *Optioneering of alternative designs;*
- *Conceptual and detailed designs and documents;*
- *Quality management;*
- *Water quality monitoring;*
- *Training and capacity building;*
- *Operational monitoring.*

“Delivers the technical and organisational expertise to engineer innovative and affordable solutions in water supply”



Water Sector

Our Approach

At Nicholas O'Dwyer we understand water; we understand how it works and why it is the most fundamental contributor to the successful functioning of any society around the world.

We understand what it takes to deliver a water project in the most arid conditions and in the wettest, on time and in budget and we apply that experience to every project we undertake to ensure that you receive the best solution to meet your needs.

But most importantly we build relationships that work for you. It is this partnership with you, the client, and all members of the supply chain that ensures you benefit from the expertise across all disciplines.

The world is a changing place. We understand that your needs change and that we must be flexible to those needs.

Our approach stems from our belief that:

- *Innovation is key, yet we must deliver robust, practical solutions, guaranteed by our broad and varied experience in the water sector;*
- *Complexity should be simplified. Water Infrastructure Projects are not simple but we know how to manage the complexities to deliver results;*
- *Value for Money is critical. That's why we aim to do more with less, we use the latest information and communication technology to deliver better performance with less of your resources;*
- *Encouraging our staff to excel in all that they do benefits the project, benefits you and benefits us.*

“We understand water; we understand how it works and why it is the most fundamental contributor to the successful functioning of any society”



CASE STUDIES



KERRY CENTRAL REGIONAL WATER SCHEME

Ireland

The Project was awarded “**Engineering Project of the Year, 2018**” by Engineers Ireland, “**Civil Engineering Project of the Year**” by ICE and was included in the short-list in the top 4 for the “**Global Water Project of the year (2019)**”.

This €30million project involved the development of a new water treatment plant (WTP) for Central Kerry and will remove approximately 62,000 customers from the EPA's Remedial Action List and will ensure a sustainable, safe and secure drinking water supply to “Ireland's tourism capital”. The master plan for the Kerry CRWSS also provided for the construction of 3 No. storage reservoirs (30,000 cu. m. at Killarney and 12,500 cu.m. at Scart and at Farmer's Bridge) and major pipelines (10km of 600mm Rising Main).

The Project also included:

- *Upgrade of Intakes, including a hydroelectric power turbine;*
- *15million litres of water storage (about 6 Olympic swimming pools);*
- *Process water treatment including sludge treatment & recycling of treated supernatant waters to the head of the works;*
- *Pumping stations & pipelines.*

Nicholas O'Dwyer completed the preliminary design, planning, tender documents, procurement, contract administration/supervision and close out. This project was delivered on time, under budget and to exceptionally high standards. It involved working in a very constrained site, highly sensitive environment (SAC, Pearl mussels etc), while maintaining supplies to consumers from the existing water treatment works.

We utilised significant levels of research and application of theoretical and practical engineering methods to evaluate and identify solutions to a range of complex engineering problems which included:

- *Detailed water demand forecasts;*
- *Specialist hydrological assessment for Lough Guitane & Owgariff River;*
- *Analysis of raw water quality and identifying appropriate treatment technologies;*
- *Hydraulic modelling for network and storage assessment;*
- *Environmental assessments and identification of mitigation measures.*

“The new Water Treatment Plant is amongst the largest in the country and can provide c.51mld of drinking water daily”



ZARQA WATER RESTRUCTURING AND REHABILITATION

Zarqa Governorate, Jordan

The Zarqa Governorate is located in the Central Region of Jordan and to the North East of the capital of Amman. It has an area of 4,761 square kilometres and a population of 871,600. The population is rapidly expanding to a projected 1,690,000 by 2030.

The objectives of the Zarqa Governorate Water System Restructuring and Rehabilitation Project are to:

- *Improve the hydraulic efficiency and performance of the water supply network;*
- *Reduce high rates of water loss in the water supply network;*
- *Provide greater access to network water particularly in areas serving impoverished population groups.*

The proposed project works includes for a major restructuring of the network including the development of water supply areas (WSA), distribution areas (DA) and district metering areas (DMA) with a transition away from direct pumping into supply. The proposed works includes for approximately 35km of new and replacement primary and secondary trunk mains and approximately 550km of tertiary distribution mains.

The Funding Agency was the Millenium Challenge Corporation (MCC)

Services Provided:

- *Undertaking detailed topographic surveys together with the assessment of existing assets and condition assessments of the existing pipe network;*
- *Development of Hydraulic Modelling of existing networks and future design horizons;*
- *Design of Solution Scheme, including District Metering Area (DMA) and Pressure Control Zone (PCZ) design;*
- *Design of commissioning works and the development of and transition plans;*
- *Preparation of Detailed Design Reports, Site & Route Selection & Cost Estimates;*
- *Preparation of Tender Documents for 6 No. Contract packages using the FIDIC Red Book;*
- *Health and Safety Management;*
- *Procurement;*
- *Services also include Construction management and supervision of all contract packages.*

“This project provided the framework for an improved water supply for over a million people”



BIRMINGHAM RESILIENCE PROJECT

United Kingdom

Birmingham is one of the largest cities in the United Kingdom with an estimated population of 3.5 million. For over a century most of Birmingham's water has flowed down the Elan Valley Aqueduct (EVA) from reservoirs in the Welsh hills.

The aqueduct is now over 100 years old and will need regular maintenance to keep it in service. This means draining it for extended periods. The Birmingham Resilience Project provides an alternative source of water during these essential maintenance periods.

At Lickhill a new water intake and pumping station, on the banks of the River Severn, will pump water to Birmingham. The majority of the pumping station is invisible from view, but elements above ground are accommodated within a building designed to look like a farmer's barn. From the pumping station at Lickhill, the water begins its 25 kilometre journey to Frankley Water Treatment Works in Birmingham.

The new pipeline, which is one metre in diameter, is a combination of open trench and a series of tunnels to minimise impacts during construction. Once water reaches Frankley it is treated at the works prior to supplying Birmingham with water. The total transfer capacity of the system is 140 million litres per day and the overall cost of the project is £300 million.

The project involves a high level of collaboration between Severn Trent Water, the contractors, mechanical and electrical suppliers and designers and is delivered through the NEC Form of Contract.

Nicholas O'Dwyer are the designer for the main Contractor and our services include detailed design for the new intake, pumping station, pipeline and associated structures. This included the development of BIM models for key components of the scheme to ensure each element can be installed and constructed without clashing.

“The project links a new source on the River Severn, over a distance of 25km to an existing Water Treatment Plant at Birmingham, a city with an estimated population of 3.5m”



LEIXLIP WATER TREATMENT PLANT

Kildare, Ireland

Leixlip Water Treatment Plant is the second largest water treatment plant in Ireland. The plant serves an area of 454km² and approximately 500,000 people.

Nicholas O'Dwyer was appointed consultant for the original Leixlip Water Treatment Plant (Stage 1) which was constructed in the 1960's. Nicholas O'Dwyer's involvement has continued since then through to the completion of plant augmentation schemes in the 1970's, 1980's, 1990's and now 2010's.

Under the Stage 4 expansion, in the 1990's, the capacity of the plant was increased by 75% to 175ML/day. Nicholas O'Dwyer was responsible for the design and project management of the new Intake System, the new Clear Water Tank, High Lift Pumping Stations, the Sludge Processing and Dewatering Plant. Some of the processes involved were the first of their kind to be installed in Ireland.

The latest expansion - Stage 5, brought the plant capacity to 255ML/day which can supply up to 1,000,000 customers. It included the construction of a new stand-alone 80ML/day Water Treatment Plant on a site adjacent to the existing plant and cost €40 million.

The new Treatment Plant incorporates the following elements:

- Expansion of Existing Intake and New Intake Pumping Station;
- New Water Treatment Plant encompassing;
- Flash Mixer;
- Sedimentation Tanks;
- Rapid Gravity Filters;
- Clear Water and Disinfection Contact Tank;
- New Delivery Pipelines;
- Sludge Dewatering Systems.

All required Chemical Storage and Dosing System (including Aluminium Sulphate, Poly Electrolyte, Sulphuric Acid, Chlorine, Fluorine and Soda Ash) .

Services Provided:

- Design Review Report;
- Detailed Hydrological Assessment Report;
- Two Stage Procurement of Design Build Contract;
- Preparation of Prequalification Documents;
- Design Build Tender Document Preparation;
- Supervision of Construction;
- Detailed Environmental Studies.

“The capacity of the plant was increased to 255ml/day and serves up to 1,000,000 people”



WATER STRATEGY FOR COUNTY KILDARE

Kildare, Ireland

This project, for Kildare County Council, involved the review of existing water supply systems and the development of a county wide strategy to satisfy the future water supply needs of the county. The existing population at the time was about 140,000 people. The water demand was projected to increase from approximately 55MI/day to over 100MI/day over the 20 year design period and serve a population of 250,000 people. This was as a result of Kildare's location within the Greater Dublin Area and the associated development pressures within the county.

Nicholas O'Dwyer was tasked with the assessment of the existing water supply system, future water demand and water treatment requirements. The firm was responsible for the identification and analysis of potential surface water and groundwater sources and development of a water distribution strategy to satisfy future requirement.

Water distribution models were prepared together with economic assessment and phasing.

The study recommended the development of a number of wellfields and the River Barrow as new water sources to augment existing supplies from the River Liffey.

The strategy also identified the infrastructure needed to distribute water throughout the county and provide the necessary security of supply. The main works, valued at €160 million, included 40MI/day Water Treatment Plant on the River Barrow, 18MI/day Wellfield Development, 40MI Reservoir Storage and 240km of 1000mm to 150mm diameter pipelines.

“The strategy identified a number of new sources, storage and network improvements valued at €160m to supply a future population of 250,000 people”



BOHERBOY WATER SUPPLY SCHEME

Dublin, Ireland

Dublin City is home to over 1 million inhabitants. The objective of the €50 million Boherboy Water Supply Scheme was to augment and extend the water supply infrastructure for much of the southern section of Dublin.

This was achieved by providing two additional large water storage reservoirs, one at high level and one at low level, and a series of distribution mains from each reservoir to serve large areas of the southern part of the capital city.

The project included the provision of 24,000m³ and 17,500m³ reservoirs, together with ancillary services and site works. Two high flow pumping stations were also required to feed the reservoirs.

These pumping stations have duty and standby pumps, and auxiliary booster pumps to ensure security of supply. Control Buildings were provided at each reservoir site for valving control, pump control and chlorine dosing boosting facilities.

A series of large interconnecting pipework was also provided on the main water transmission network, including a draw off an existing live 1,600mm diameter water main from the primary Water Treatment Plant to the city.

Nicholas O'Dwyer was appointed by the local authority, South Dublin County Council, and was responsible for preliminary design, detailed design, procurement and project management for the construction of the scheme.

“The objective of the 50m Boherboy Water Supply Scheme was to augment and extend the water supply infrastructure for much of the southern section of Dublin City”



VARTRY WATER SUPPLY SCHEME Wicklow, Ireland

Winner: ACEI Award 2022 - Project Management Category

The Vartry Water Supply Scheme provides drinking water for a supply area stretching from Roundwood, through north Wicklow up to south Dublin and serves over 200,000 people. It was developed by Dublin Corporation in the 1860s and includes two reservoirs, a water treatment plant, a 4km tunnel under Callowhill and 40km of trunk mains that deliver water to storage reservoirs at Stillorgan in Dublin. The scheme was a significant engineering feat, with much of the ground and building works being carried out and completed by men using only picks, shovels, horses and carts.

At the time, the scheme greatly improved sanitation in Dublin City and helped reduce outbreaks of cholera, typhus and other diseases associated with contaminated water. The original Vartry Water Supply Scheme still provides drinking water to around 16% of the Greater Dublin Area.

The scheme now needs major upgrade and investment to ensure a safe and sustainable water supply for the north Wicklow and south Dublin areas. This includes replacement of old pipework within the existing dam, a replacement water treatment plant of 80MI/day capacity, a new 4.5km link main between the treatment plant and existing trunk mains and 160,000MI coverage storage reservoir at Vartry.

At an estimated total cost of €200 million this is one of the largest investments the new Irish Water Utility, Irish Water, will make in its asset base. Nicholas O'Dwyer provides design, planning, procurement and construction supervision services on this project for Irish Water.

“The new water treatment plant uses cutting edge treatment technologies to secure the supply of clean water for 200,000 people in North Wicklow and South Dublin”



Winner: ACEI Award 2022 - Project Management Category

WATER SUPPLY DISTRIBUTION NETWORK (PART 1)

Dar Es Salaam, Tanzania

Dar es Salaam accounts for 40 percent of the urban population of Tanzania and is expected to continue to absorb the bulk of new urban residents. By 2030 it is expected to have over 10 million inhabitants, many of whom will reside in peri-urban areas that are currently underserved.

Given its role as the engine of the economy, and the locus of key industries, commerce, the port, the rail and road transport services, it will continue to draw more resources, including water. Keeping up with the demand for provision of sustainable infrastructure, including water supply and sanitation (WSS), is therefore a critical challenge for the city.

Through various investments on the supply side, the water production capacity for Dar es Salaam is expected to double, and this project aimed at distributing this extra water by enabling expansion of Water Supply Distribution in Unserved Priority Areas.

Part one (packages 2B and 2F) (Tegeta-Mpiji and Mpiji-Bagamoyo) was a key priority for expansion given the historically low levels of service. The project scope provided for an additional 1,260km of pipes, 42 kiosks, and 214 stand posts and benefit for 453,000 people

Description of services provided within the assignment:

The project included the supervision of supply and installation of Secondary and Tertiary Distribution Network and Installation of Domestic Meters from University Reservoirs to Bagamoyo Town.

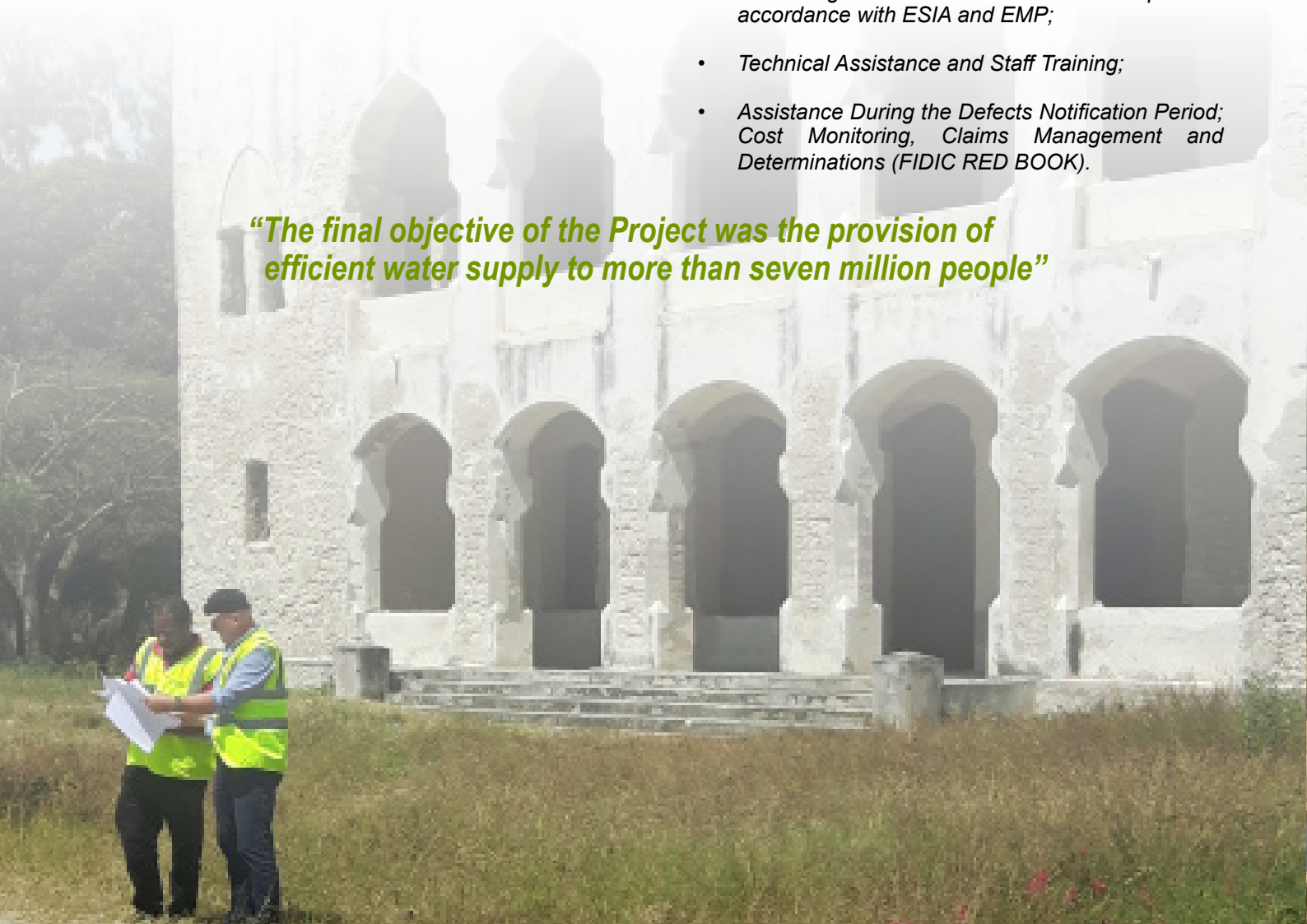
The Project included the construction of the following:

- 200mm to 75mm Diameter Tertiary Watermains;
- 500mm to 250mm Diameter Primary Watermains;
- over 50 No. PRV's, District Meters etc.;
- 3 No. 5,000 m³ RC Reservoirs and 3 No. Pumping Stations.

Services Provided:

- Project Management and Administration;
- Detailed Design Review, Review of Tender documents;
- Assistance During Procurement Stage;
- Construction Supervision;
- Monitoring of Environmental and Social Impacts in accordance with ESIA and EMP;
- Technical Assistance and Staff Training;
- Assistance During the Defects Notification Period; Cost Monitoring, Claims Management and Determinations (FIDIC RED BOOK).

"The final objective of the Project was the provision of efficient water supply to more than seven million people"



LILONGWE WATER BOARD TREATMENT WORKS

Malawi

Lilongwe is the capital and most populated city of the African country of Malawi. It has a population of over a million. The city is located in the central region of Malawi, in the district of the same name, near the borders with Mozambique and Zambia, and it is an important economic and transportation hub for central Malawi.

The main objective of the project is to prepare detailed engineering design, cost estimates and tender documents for Treatment Works III (50,000m³/day Drinking Water Treatment Plant), provide assistance in the tendering process and to supervise construction of the works.

The project also included upgrade of existing water treatment plants (capacity of 125,000m³/d) to serve over 1.1 million people in the city of Lilongwe, Malawi.

The scope of the works include:

Analysing the suitability of locating Treatment Works III on an alternative site to one proposed in preliminary design report;

Preparation of detailed engineering designs, drawings, specifications for the Water Treatment Works III (TW III) and tender documents;

Financial Analysis - Preparing cost estimates, economic, and financial assessments including the following:

Preparing detailed cost estimates for the technology, civil works, commissioning, and erection including environmental and social costs;

Environmental and social scoping of the water supply facilities;

Assessing and reviewing operational efficiency of the existing water treatment plants (TWI and TWII) and proposing measures for efficiency improvement, including detailed designs and cost estimates;

Construction supervision of the Treatment Works III including efficiency improvement measures for TWI and TWII.

Description of services provided within the assignment:

- Detailed engineering design;
- Review of Tender Documents including Drawings, Specifications, Modifications to Conditions of Contract (FIDIC Red Book);
- Preparation of Contract Documents, Tender Evaluation and Recommendation of Preferred Bidder, Tender Adjudication;
- Construction Management including; Review of Contractors Proposals Management of Variation Orders Commissioning Certification Interim and Final Valuations Dispute Resolution;
- Construction Supervision (FIDIC Red Book);
- Defects Liability Monitoring.

New 50,000m³/day drinking Water Treatment Plant together the upgrade of existing Water Treatment Plants capacity of 125,000m³/d) to serve over 1.1 million people in Lilongwe, Malawi.



RUNDU PURIFICATION PLANT EXTENSION

Namibia

The project is to supply water to Rundu Town, NamWater operates two river water supply schemes, Rundu and N'karapamwe.

At present, the total capacity of these two schemes is about 840 m³/h. Both schemes are old and are running at maximum capacity. As a result, there is now a need for a new water scheme (water treatment plant with a capacity of 1800 m³/h; water supply abstraction, reservoirs and conveyance systems).

The Objective of this assignment is for the Consultant to design the required water supply infrastructure, carry out Environmental and Social Impact Assessment (ESIA) studies, compile tender documents, do contract administration, construction supervision of the new water supply scheme and decommissioning of the old plant at Rundu.

The new water supply scheme will ensure that the 2037 water supply demand is met.

Description of services provided within the assignment:

- *Intake facility (flooding/ water level influences);*
- *Raw Water Treatment Process;*
- *Chemical Dosing;*
- *Storage Reservoirs;*
- *Ancillary Pipework and Valves;*
- *Auxiliary Structures (incl. buildings and access roads);*
- *SCADA systems;*
- *Assessment of Existing Infrastructures, Storage Reservoirs, etc.;*
- *Upgrade of Existing Water Supply Schemes;*
- *Decommissioning of Redundant Infrastructure.*

“The new water treatment plant at Rundu will ensure water security up to 2037”



Water Sector

Sample Client List

Irish Water

Department for Regional Development, Northern Ireland

Department of the Environment, Community & Local Government

Environmental Protection Agency Ireland

European Union

Irish Aid

Millennium Challenge Account - Jordan, Tanzania, Liberia

Water Services National Training Group, Ireland

Yorkshire Water, Severn Trent Water, UK

VALUE SOLUTIONS
FOR YOUR NEEDS

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