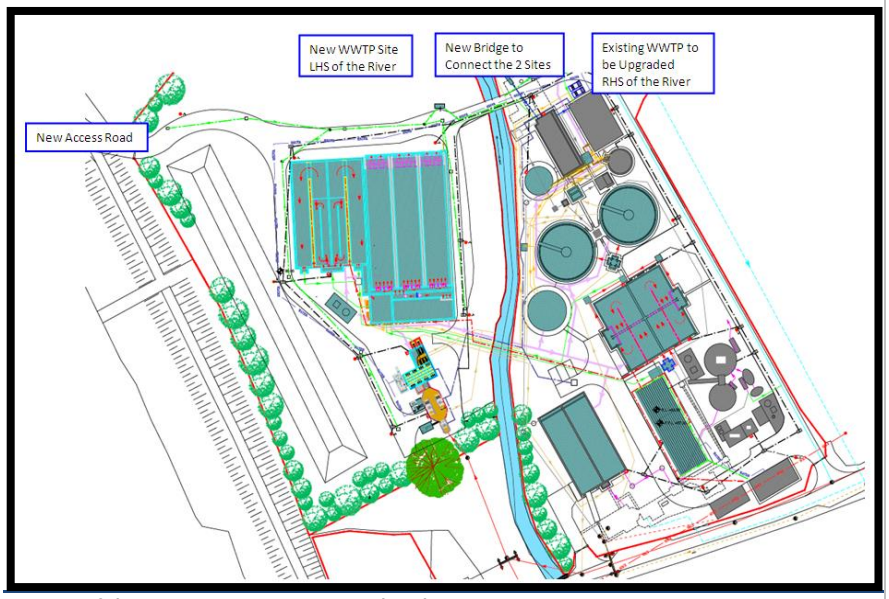
APPENDIX B2: CERTIFICATE OF SATISFACTORY EXECUTION –WORKS ONLY

ACTIVITY *(Title of Applicant Activity)*	**Process, Civil, Mechanical & Electrical Design and Build Contractor acting as PSDP and PSCS**		
SITE **Construction contract:** *(Title & brief description)*	**Cavan Sewerage Scheme Wastewater Treatment Plant Upgrade** Glan Agua Ltd was awarded the Design and Build Contract for the Cavan WWTP Project. This included all aspects of a WWTP Upgrade including Process, Civil, Mechanical and Electrical Design and Build. The Contract provides for the design and build upgrade in capacity from approx. 20,000PE to 30,000PE. The operation and maintenance of the plant during the design and build phase and for a period of 1year after completion also forms part of the Contract.    		
Site location:	Cavan		
Proportion of Project undertaken by the Applicant	100%	Tender entity (*Sole trader/ Joint Venture)*:	Private Limited Company
VALUE Construction contract value at award stage including cost of services where applicable:	€9,900,000	Construction contract value at completion (including cost of services where applicable:	Ongoing
GENERAL INFO Role of Company in delivery of Service:	**Scope of Works** The overall scope of works for the Cavan WWTP Upgrade Contract is as follows: • Demolish existing inlet works and design and construct new preliminary treatment facility with the capability of ready expansion to cater for ultimate design flows (54,000PE);		

- Design and Build preliminary treatment units (sized for maximum flows of 10DWF associated with a design loading of 30,000PE);
- Refurbish existing storm tank and construct 1 No. additional storm water tank (1,969m^3) c/w odour removal and cleaning mechanism on both;
- Design and build anaerobic zones to cater for design flows to full treatment (i.e. 3DWF at 30,000 PE);
- Refit existing aeration tanks with diffused aeration system and separate anoxic zones to provide nitrification and denitrification capacity as required;
- Design and construct additional aeration tanks with integrated anoxic zones to provide for additional treatment capacity as required;
- Refurbish 2 No. existing secondary clarifiers with appropriate mechanical and electrical components.
- Design and Build additional final clarification capacity;
- Design and construct the tertiary treatment unit;
- Refurbish existing tertiary treatment system;
- Refurbish existing picket fence thickener (PFT);
- Refurbish existing dewatering building;
- Design and Build a new administration and control building;
- Provide new chemical storage and dosing facilities as required;
- Upgrade existing ESB Medium Voltage sub-station provided as part of leachate Pre-Treatment Contract;
- Design and Build air blower buildings as required to ensure blowers are housed internally;
- Design. provide, install, test and commission all associated mechanical and electrical components associated with upgrade Works;
- Design and prepare all ground works, design and construct access roads, site roads, bridges and site fencing.



Layout of the Cavan WWTP Upgrade Site.

Existing Facilities

The existing Cavan WWTP process is a conventional aeration process and incorporates; Inlet Pumping; Screening; Grit Removal; Four Surface Aeration Tanks; Two Final Clarifiers; Sludge Thickening and Dewatering; Phosphate Removal; Two Storm Holding Tanks and SBR leachate pre-treatment. The existing Plant has a nominal design capacity of 19,000PE.

Design and Build of New Facilities:

Glan Agua Ltd. under the Contract are to design and construct the new

preliminary treatment facility (30,000PE) with the capability of ready expansion to cater for ultimate design flows (54,000PE).

Process Design & Construction

To carry out the process design the following parameters were taken into concideration:

The **Influent Quality** encountered is as follows:

Parameter	Range of Values mg/l	Typical Conditions mg/l
Biochemical Oxygen Demand (BOD5)	100-500	265
Chemical Oxygen Demand (COD)	150-1,170	500
Total Suspended Solids (TSS	100-700	250
Total Phosphorus (as P)	2-12	7
Ortho-Phosphate (as P)	1-11	4
Total Ammonia (NH4)	4-50	22
Total Oxidised Nitrogen (TON)	1-7	3
Total Keldajh Nitrogen (TKN)	15-80	40
Oils, Fats and Grease (OFG)	4-100	25
Alkalinity (CaCO3)	180-350	250
pH	5.5-8.5	7
Fats, oils, greases	-	150

The Final Effluent Discharge Standards imposed on the Contract are as follows:

Parameter	Standard
Temperature	25oC (max)
pH	6.0 – 9.0
BOD5	3.8
COD	125
Suspended Solids	10
Ammonia (as N)	0.2
Ortho Phosphorus (as P)	0.11
Total Nitrogen (TN)	15

These effluent quality requirements required that in addition to Carbonaceous BOD removal it had to provide ammonia removal, total Nitrogen Control and phosphorous removal. Glan Agua Ltd. are implementing a sophisticated Biological Nutrient Removal (BNR) type process in which Biological Phosphorous removal, Biological Nitrification, De-nitrification, Secondary Nitrification and MLSS degassing are achieved.

The process selected can be summarized as follows:

- Preliminary Treatment (screening, degritting and FOG removal);
- Anaerobic/Anoxic/Aerobic Treatment;
- Secondary nitrification;
- Final Clarifiers with vacuum system and degassing tower;
- Storm water Storage;
- Treated Effluent Post Aeration;
- Picket fence thickener (PFT), Sludge Drum Thickener, Sludge Holding facility;
- 2 No. Sludge Centrifuges;
- Leachate Pre-Treatment.

The main biological process element of the Plant is based high rate Modified Johannesburg (MJ) process with patented BIOGRADEX technology, of sludge degassing of the mixed liquor upstream of the settlement tanks.

The new administration and control building will coordinate the activities of

	the WWTP site. All automation and control facilities will report to this building in order to have more centralised control of the WWTP. This will also aid in the monitoring and monthly reporting of the WWTPs activities. **In-Situ Concrete Water Retaining Structures** The project involved large in-situ water retaining structures, this involved the excavation of large quantities of rock adjacent to a river and below the water table. Aeration Tanks Capacity: Greater than 7,000m³ Settlement Tanks Capacity: Greater than 5,000 m³  **Demolition Works:** The Contract includes for the demolition of the existing inlet Works and the design and build of new primary treatment facilities. Other minor demolition works are included in the contract in order to increase the capacity and the quality of existing facilities. **Health & Safety Aspects of the Contract** • Entry into Confined Space • Excavations • Structural Stability • Lifting Operations / Cranes • Road Works • Traffic Management • Scaffolding • Underground Services • Overhead Cables • Working at Heights • Piling • Vibration, Noise and Dust • Working with hazardous materials / live sewers
Name & address of Contracting Authority responsible for the project:	Cavan County Council, Water Services Section, 17 - 19 Farnham Street, Old Library Building, Cavan Town, Co. Cavan.
Contracting Authority contact name:	Peter Gallagher — Phone no.: +353 49 4331799
OTHER INFORMATION Provider of Civil Design : Glan Agua Ltd. Provider of Civil and Building Construction: MEIC Ltd. under Sub-Contract to Glan Agua Ltd.	

Provider of Mechanical, Electrical & Process Design and Installation: Glan Agua Ltd. Project Supervisor (Design Stage): Glan Agua Ltd. Project Supervisor (Construction Stage): Glan Agua Ltd.	
CONTRACTOR'S NAME:	Glan Agua Ltd