Expansion of existing textile effluent treatment plant for water recycling

Step 1: Pre-qualification / Expression of interest

1. Introduction

Glodina Towelling (Pty) Ltd (Glodina) is a terry towel manufacturer in Hammarsdale, KwaZulu Natal, South Africa that weaves, dyes and finishes predominantly cotton products. An effluent treatment plant is in place that processes effluent from the dyehouse and sizing department for discharge to the municipal water treatment plant. We plan to install additional equipment to recycle 85% of our effluent for reuse as softened feed water to our dyehouse.

The site will also be increasing the extracted borehole water which will be treated in the proposed water treatment plant for the same purpose.

2. Expression of interest

Please complete Intent to Submit and Expression of Interest (Annexure1) and return so Glodina can determine the EOI from your company.

Based on the information received in response to this request, a shortlist of prospective turnkey suppliers will be compiled, and each will be requested to provide a detailed proposal (technical and commercial) with pricing in Step 2 of this application process.

To express your interest and to show your capability to supply a turnkey solution for this purpose, please provide the following information:

1. Company overview
2. References of similar projects in the textile industry that illustrate your capability to process textile factory (dyehouse and sizing department) effluent to meet the criteria for reuse as softened dyehouse feed water, with contact details.
3. Proposed technologies and process concept diagram
4. Evidence that the company can provide:

    - Project Management
    - Engineering design
    - Civil engineering / specifications for civil works
    - Equipment and all supporting infrastructure
    - Construction / Installation supervision
    - Skilled Labour for turnkey installation
    - Valid safety file
    - Check out
    - Commissioning
    - Startup

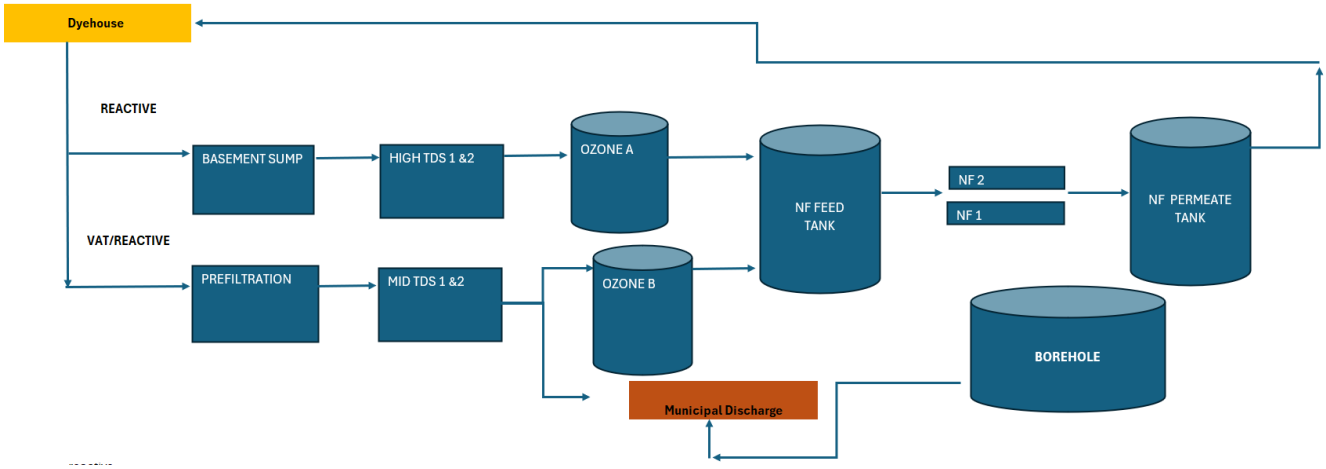
- Operation and operator training
- Babysitting
- Performance test approx. 1 month after start-up

3. Technical Information (Please also see attached documents)

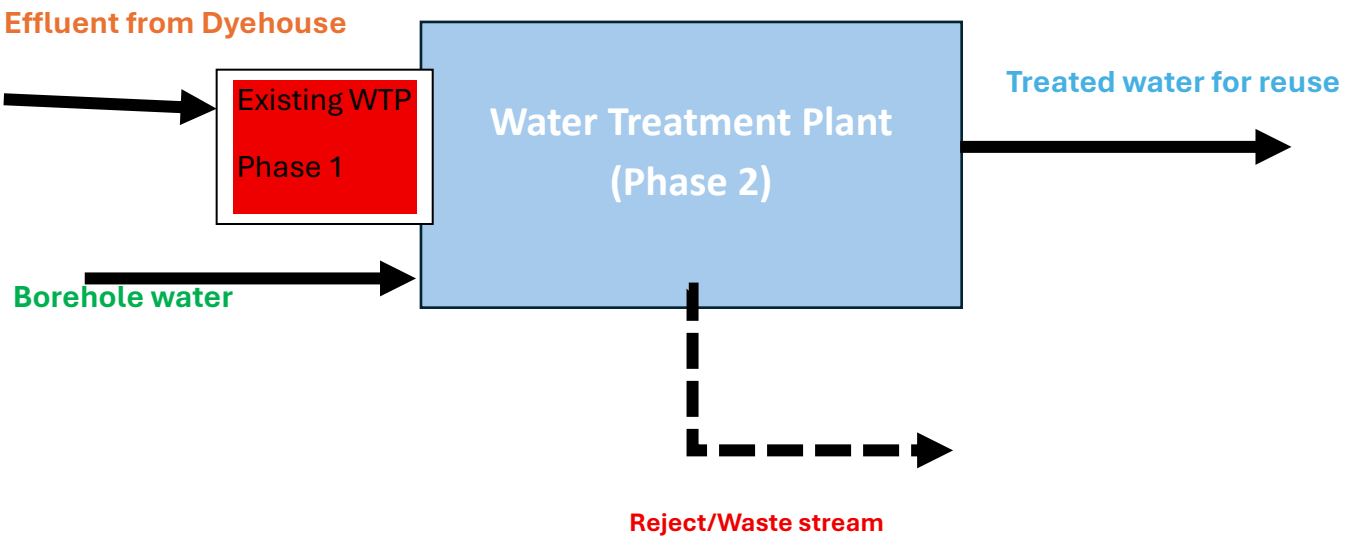
ETP Capacity

Required ETP capacity to process up to 1.2 ML/day of effluent, with a possible instantaneous surge of up to 120 kl per hour (for a period of possibly 8 to 10 minutes) to reclaim at least 85% for reuse as softened feedwater to the dyehouse. Current average use of softened feedwater is 800 kl per 24-hour period on days of operation.

Process Flow of Current Effluent Treatment Plant



Integration of Phase 2 Water Treatment Plant for Effluent Reuse



Required Output of New ETP

We provide the following information in order to establish whether your company is interested and able to provide a technically suitable solution for our requirements.

Water specification for feed water to dyehouse:

Parameter	Specification
Hardness Calcium Carbonate ($CaCO_3$)	Max 0.8 mg/l (8ppm)
Calcium (Ca)	Max 0.4 mg/l
Magnesium (Mg)	max 0.4 mg/l
Copper (Cu)	max 0.01 ppm
Manganese (Mn)	max 0.02 ppm
Iron (Fe)	Max 0.02 mg/l
pH range	6.5 to 7.5
Salts	Nil
Suspended solids	Nil
Active Chlorine	Nil

Disposal of Reject Concentrate

Propose an existing or integrated solution for the responsible disposal / reuse / reclamation of reject concentrate and sludge.

Attachments:

- Intent to submit EOI
- Effluent and Borehole water test results
- Current ETP process flow diagram
- P&ID existing ETP
- Layout Diagram Ozone Treatment Plant
- Layout Diagram Dyehouse

Examples of textile processing chemicals that may be present in the raw dyehouse effluent:

- Cotton fibres (and possible small amounts of polyester fibres)
- PVA
- Starch (potato)
- Reactive dyes
- Vat dyes
- Sodium hydrosulphite
- Disperse dyes
- Dispersing agents
- Optical Brightening Agents*

- Caustic Soda
- Acid
- Sodium bicarbonate
- Common Salt
- Sodium sulphate (Glauber's salt)
- Sizing chemicals (PVA, Starch, CMC)
- Levelling agents
- Soda ash
- Softeners
- Anti-microbial (silver, but could vary in the future)
- Anti-fungal
- Spin finish
- Waxes
- Surfactants
- Anti-foam
- Enzymes
- Foam

General information on the Textile Factory and Dyehouse

- The dyehouse has 12 fabric jet-dyeing (exhaust) machines and 3 yarn dyeing machines, with a total liquor capacity across all machines of 30 422L when filled to capacity.
- The dyeing is a batch process.
- Most dye baths (vat and reactive dyeing of cotton) and bleaching will have a high (alkaline) pH, often above pH12. Occasionally, disperse dyes are dyed and have a low pH (+-pH4-5.5).
- Dye exhaustion is typically higher in vat and disperse dyelots than in reactive dyelots, thus there may be a higher colour load on dark reactive shades than equivalent other batches.
- Common salt (NaCl) and Glauber's salt (NaSO4) or sodium sulphate, are both used in the dyeing process, increasing conductivity.
- Sizing trough drains (once per day) and preparation baths (every first drain on woven fabric dyeing) are likely to contain PVA and starch, as well as waxes.
- Rinse baths (after the dyeing process) often have a colour component and will contain dyeing chemicals but tend to be less concentrated in terms of chemicals and are closer to neutral pH. There can be up to 18 rinse baths per dyebatch.
- Finishes include silicone softeners and antimicrobial finishes.