

	Scope	Technology
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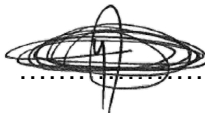
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1. INTRODUCTION

Duvha Power Station is a coal fired station situated in Witbank, Mpumalanga. The Power Station has six units, each with a generating capacity of 600 Megawatts (MW) units. All sewage effluent generated at this power plant is directed to Ikageng sewage plant for treatment to the qualities prescribed in Duvha Power Station water license requirements. The average flow rate of the incoming raw sewage to Ikageng plant is 12.5 cubes per hour. Additionally, effluent from septic tanks from the station will be disposed into Ikageng sewage plant by means of vacuum trucks. Average total volume is 80 cubic meters per month.

2. SUPPORTING CLAUSES

2.1 SCOPE

The scope of work entails the plant operation and maintenance of vegetation growth around the ponds, chemistry analysis of the effluent in accordance with SANAS 17025 and housekeeping. The operation of the plant is governed by Water Services Act 108 of 1997/ Regulation 2834

2.1.1 Purpose

The purpose of this document is to outline the scope of work for Ikageng Sewage Plant Duvha Power Station, which is to be carried out by an appointed contractor.

2.1.2 Applicability

This document is only applicable to Duvha power station.

2.2 NORMATIVE / INFORMATIVE REFERENCES

2.2.1 Normative

- [1] ISO 9001 Quality Management Systems.
- [2] National Water Act General Limits for Discharge: NATIONAL WATER ACT 36 OF 1998
- [3] ISO 17025

2.2.2 Informative

- [1] Health and Safety requirements
- [2] Environmental requirements
- [3] Site regulations and access control SAS0012
- [4] Operating instruction UI 382-171996

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2.3 DEFINITIONS

2.3.1 Disclosure Classification

Controlled Disclosure: Controlled Disclosure to external parties (either enforced by law, or discretionary).

2.4 ABBREVIATIONS

Abbreviation	Description
SHEQ	Safety, Health, Environment and Quality
PTW	Permit to work
QM	Quality management

2.5 ROLES AND RESPONSIBILITIES

2.5.1 Appointed contractor

The contractor shall:

- Work within the parameters of the scope of work.
- Ensure that PTW is in place before start of each work.
- Conduct a risk assessment each day before the start of every work.
- Execute the scope of work as per the employer's specification.
- Execute the scope of work with compliance to the Occupational Health and Safety.

2.2.2 Project Manager

Must ensure that:

- All work is executed in accordance with the legal requirements (Occupational Health and Safety Act 85 of 1993).
- Scope of work is executed and completed on the set timeline or date.
- The work is carried out by competent persons.

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3. SCOPE OF WORK

3.1 OBLIGATION OF THE SERVICE PROVIDER

- The contractor shall implement and maintain a green drop system program for the operation of the sewage plant.
- The service provider shall ensure adequate operational monitoring – sampling sites and frequencies according to the license and best practices.
- Weekly final effluent results shall be done by an accredited laboratory and monthly reports shall include original reports from the accredited laboratory
- The plant shall be controlled and supervised by suitable qualified experienced employees who have been classified in terms of Regulation 17, Water Services Act 108 of 1997/regulation 17
- The service provider shall assume full responsibility for compliance with relevant statutory requirements and bylaws (Example NEMA, Water Act, Audits, relevant ISO requirements etc.)
- Persons employed at water works shall be in accordance with the requirements of plant's registration which is class C.
- The plant shall be manned and supervised on 24/7 bases (four (4) shift roaster)- A minimum of two operators per shift shall be adhered to for safety purposes.
- The service provider shall have a documented Wastewater Risk Abatement Plan (W2RAP) in place and prioritise risks with mitigation measures to address inadequacies.

3.1.1 Service provider requirements for the service

- The Service provider provides qualified operators for the service.
- The Service provider provides tools, appropriate PPE, equipment and consumables to carry out the work.
- Service provider shall provide transportation of its personnel to and from to work site.
- The Service provider ensures the safety of own personnel, other contractors, and Eskom employees in the vicinity of the works by complying to the OSH Act and its Regulations.
- The Service provider plans and executes the work and provides a detailed plan for each planned maintenance opportunities.
- The Service provider performs quality control on their own work as per pre-approved quality control plans submitted to the Eskom Project Manager.
- Activities completed to be approved by an Eskom Project Manager.

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3.1.2 Monthly assessments and reports

- The Service provider will be assessed on the 15th day of the month based on KPI determined and agreed upon by the two parties which shall include the following as a minimum: -
 - Employees signed work attendants register.
 - Daily operational plant records
 - Graphically trends of chemically analysed parameters
 - Records of plant defects and risk
 - Chemical analysis reports from an accredited laboratory
 - Full complement of staff correctly classified by department of water and sanitation
 - Housekeeping of the plant.

3.2 CONSTRAINTS ON HOW THE SERVICE PROVIDER RENDER SERVICE

- The Service provider shall receive instruction from authorized personnel of Duvha Power Station to perform allocated tasks.
- Tasks to be completed in the allocated time frame provided and agreed to only when task order is issued by the Eskom project manager.
- Activities completed to be approved by an Eskom quality representative or the relant system engineer where stipulated.
- The plant operation shall comply to operational instruction Document Identifier: 382-171996

3.3 OPERATION WORK

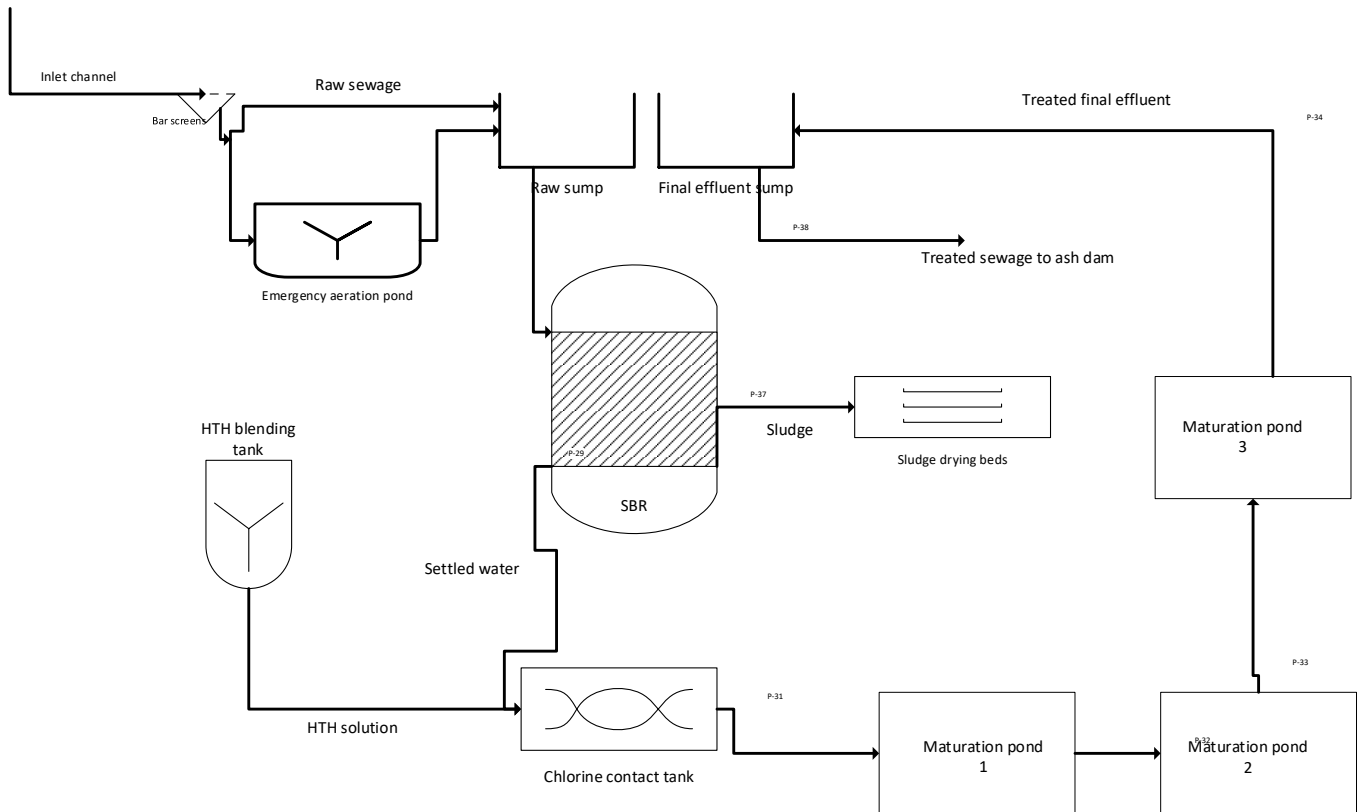
SYSTEM LAYOUT AND PROCESS FLOW

Below is a process flow diagram of the sewage treatment plant.

Figure 1: Ikakeng Sewage treatment plant PFD

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4. PERFORMANCE REQUIREMENTS

4.1 TREATED EFFLUENT STANDARD

The table below lists the treated effluent quality that the Sewage Treatment Plant is expected to achieve.

Table 1: Required treated effluent quality as required by water licence.

Substance/Parameter	Limit
pH	5.5-9.5
Ammonia (ionised and un-ionised) as Nitrogen (mg/l)	3
Nitrate (as N)	15 mg/l
Free chlorine	0.25mg/l
Ammonia (as N)	1 mg/l
COD	75 mg/l after algae removal
Faecal coliform units	0 per 100 ml
Orthophosphate (as P)	1 mg/l

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5. REVISIONS

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