**Maintenance and Management Plan for the Proposed Construction of Stormwater Drainage and Associated Infrastructure at the Kusile Power Station, near Delmas, Mpumalanga**

## 1 Project Background

Eskom Holdings SOC Limited ("Eskom") is proposing to construct stormwater drainage and associated infrastructure underneath the existing Overland Conveyor Belt (OLC) at the Kusile Power Station in Mpumalanga.

The existing Overland Conveyor Belt 1 & 2 (OLC 1 & 2) system transmits mixed coarse ash and gypsum from the Kusile Power Station to the radial stacker. The system is operating without storm water drainage infrastructure to contain ash contaminated water along the conveyor servitudes, and this has resulted in ponding and discharge of the ash contaminated water into the nearby watercourse, thereby contaminating the environment. The ash contaminated water has also resulted in environmental non-conformances being issued to the Kusile Power Station for its operations around the Radial Stacker and the OLC.

Therefore, the purpose of project, is to prevent further environmental pollution, major impacts on surrounding wetlands, and spillage of ash laden stormwater into the nearby streams. This proposed solution entails the construction of stormwater channels (*concrete V-drains*) to contain and divert contaminated water to the proposed collection sumps for storage. Thereafter, the collection sumps will be emptied by means of pumping, through overland pipelines, to the East Settling Tank (EST). A new 300mm diameter overland pipeline will be constructed from the EST to the existing Ash Dump Dirty Water channel for final disposal to the existing Ash Dump Dirty Dam (ADDD). A new gravel road of approximately 6m in width and 169m in length, for operation and maintenance of the sumps and the EST will be constructed.

A West Settling Tanks (WST) comprising of two compartments and a pump sump will be constructed to the west of the radial stacker. A 200mm diameter overland steel pipeline to transfer clarified water from the WST pump sump to the ash dump dirty water drain will be constructed. Groundwater interception drains will also be installed underneath east and west settling tank foundations with groundwater drains draining to the channelled valley bottom wetland. A portion of the groundwater drain outlet pipe will be constructed in the channelled valley bottom wetland. The drain outlet pipe will convey groundwater from the EST and WST to the wetland. Note that this is clean groundwater and is not clarified water.

The proposed upgrade of the Radial Stacker (RS) will deal with the blocked drain at the RS, by directing the water from the RS into the proposed drains, sumps and eventually to the Ash Disposal Facility (ADF) dirty stormwater channel leading to the Ash Dump Dirty Dam (ADDD).

The current operations at the radial stacker are not sustainable when considering the number of units which will be commissioned, as well as the high number of mobile equipment required to transport ash and gypsum. Eskom therefore proposes the construction of the extension of the OLC from the radial stacker to the Ash Disposal Facility. Construction of the extension of the OLC is anticipated to commence in February 2023.

## 2. Objectives of Maintenance

Appropriate maintenance and operations plans are an integral part of asset management and Eskom applies good asset management practices at all their Power Stations.

In essence Eskom's operations team is responsible for maintaining the infrastructure to the extent that premature failure is avoided. This is done by undertaking small-scale works on a regular basis and by effecting repairs for the purpose of ensuring that interruptions to the level of service are restored in the shortest possible period of time.

The core objectives of the Maintenance and Management Plan are as follows:

- To manage routine maintenance operations in an efficient manner at least cost;
- To undertake routine maintenance operations promptly for the purpose of ensuring that interruptions to the level of service are restored in the shortest possible period of time; and
- To undertake work to a defined standard that is commensurate with the relevant level of service.

## 3. System Maintenance and Operating Design

### 3.1 Maintenance Design

The proposed stormwater drainage and associated infrastructure will need to be inspected in accordance with 240-99527377 - Inspection Manual for Civil Works. Any damage to the structure or deterioration throughout the life of the structure will need to be reinstated to the original design. On shift basis, the Eskom Maintenance Operator is tasked to assess the system and recommend if maintenance is required. In addition, the maintenance of the system includes but not limited to:

- Channels maintenance; cleaning of slurry build-up in channels to prevent overflow.
- Maintenance to be performed regularly, when necessary.
- Sump maintenance; cleaning of slurry build-up in the sump to prevent sump capacity problem.
- Maintenance to be performed regularly, when necessary.

The Radial Stacker Settling Tank (ST) is designed with two equal capacity compartments which can each store 1798.1m$^3$. The water enters each compartment of the radial stacker ST from the 1.2 m wide inlet channel via one sluice gate each side. Having two compartments allows for occasional maintenance and inspection access without interrupting the functionality of the structure under normal circumstances.

### 3.2 Operating Design

Kusile Power Station is responsible for the operation, and operations include but not limited to:

- Channels operation; washing slurry in channels to the sump.
- Automatic or Manual Sump operations; emptying of sump by means of a pump system, to pump slurry to Emergency Ash Dump Degrit Sump. Also agitation system is implemented to ensure no slurry build-up in the sump.

A gravel access road (169m) will be constructed from the sump to the proposed East Settling Tank (EST) thereby connecting to the existing gravel road.

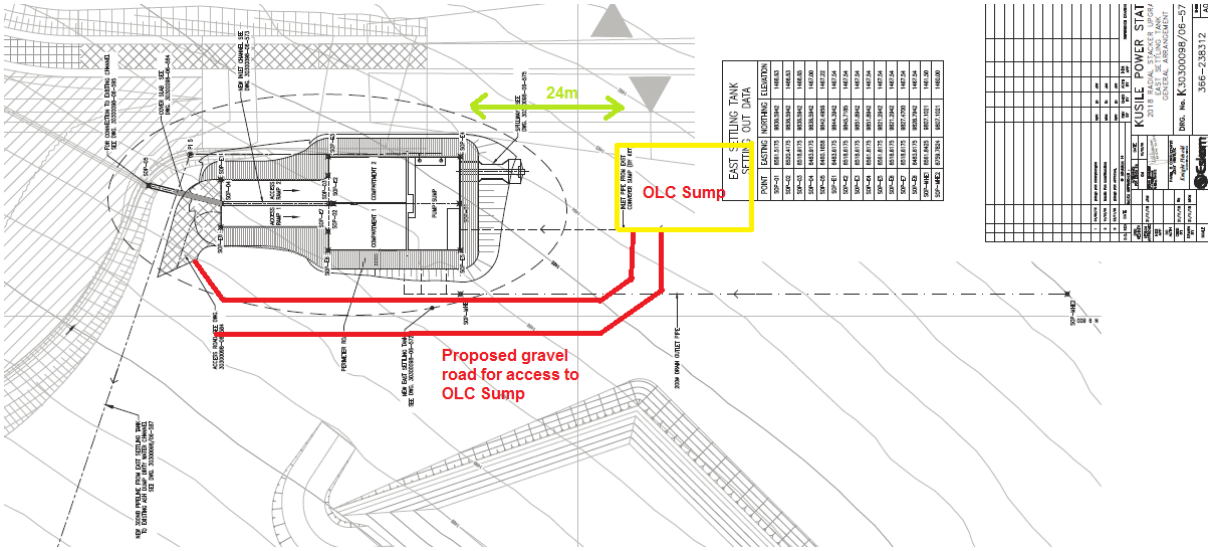


**Figure 1: Proposed gravel road to the OLC 1&2 Collection Sump**

A crawl beam is designed for operation and maintenance purposed (replacing pumps and cleaning of sump).