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To: Environmental Compliance Consultancy (ECC) – Mr Lester Harker

From: Christoff Krogscheepers, Hugo Engelbrecht and Alain Rousseau

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Reference: ITS 4427

Subject: **Transport scoping report for the Uis Afritin mine, in the Erongo region of Namibia**

DRAFT FOR DISCUSSION

1 Introduction

This scoping report outlines the existing operations of the Afritin tin mine in Uis, as well as aspects that should be evaluated in a future detailed Transport Impact Assessment (TIA) as part of the proposed expansion of this mine. The mine is located southeast of the town Uis, in the Erongo region of Namibia. The main roadways in the site vicinity include the C35, which connects Uis with Hentiesbaai, and the C36, which connects Uis with Omaruru. The mine is located south of these two roads. See **Figure 1** for the Regional Map and **Figure 2** for the Locality Plan below.

Figure 1: Regional Map

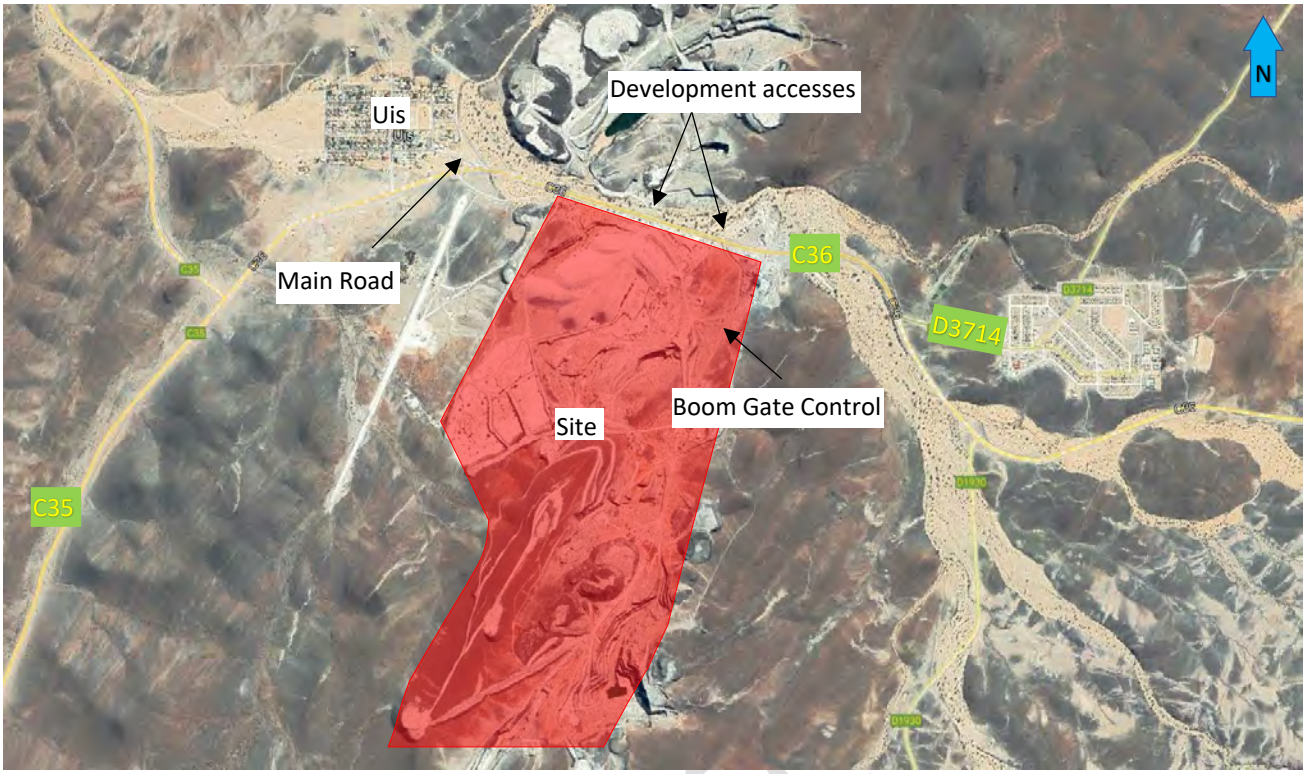

Figure 2: Locality Plan

2 Surrounding Roads

The C35 and C36 are single carriageway roads with a posted speed limit of 100km/h. The majority of these roads are gravel, however certain sections near the towns are constructed with pavement layers and an asphalt surfacing.

The section of the C36 between the Uis Main Road and D3714 intersections, is constructed and surfaced with asphalt. The width of this asphalt surface is approximately 7,0 meters wide. The C35 is mostly a gravel road, however about 20km outside of Hentiesbay it is constructed with pavement layers and surfaced with asphalt.

The condition of the C36 road, near the development, is in a relative poor condition with various spots of cracking and failure. There are various reasons for this type of failure to occur, but the most likely cause is that the traffic load exceeds the design capacity of the roadway as well as excessive travel speeds. It is recommend that the road be upgraded and resurfaced from a safety as well as a maintenance point of view. This upgrade should be about 1km in length along the C36 roadway (500 meters on east and west side of the mine access) and should be funded by the developer.

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3 The Development

This Afritin mine, excavates and process Tin (Sn) that gets transported to Walvis Bay via the C36, C35 and C34. The current operational hours of this mine is 3, 8 hour shift per day 7 days a week.

The existing tin mine throughput production is approximately 80 tonnes of tin raw material per hour (which produces approximately 65 tonnes of tin final product per month). As part of the next phase of production, it is planned to increase the total throughput by approximately 50% to 120 tonnes of tin per hour (or approximately 100 tonnes of tin per month). This will be achieved by:

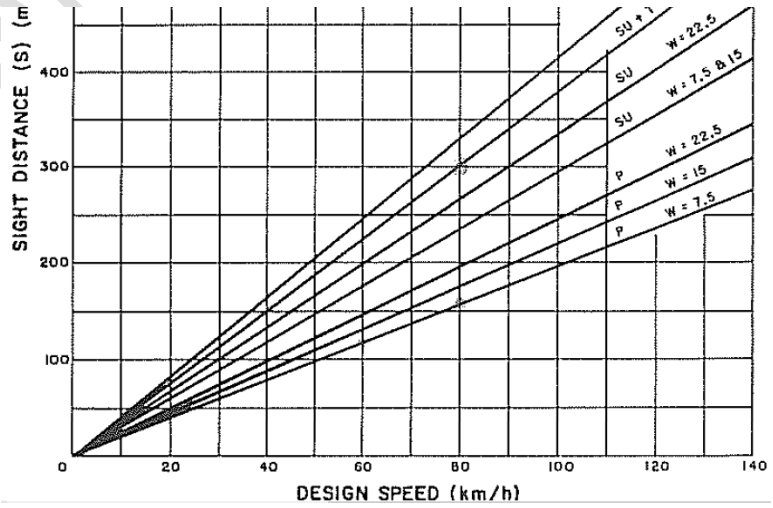
- *Modular expansion of individual circuits,*
- *Improve overall recovery of tin from 60% to 70%, and*
- *Improve overall recovery of tantalum from 15% to 30% (improved magnetic separation).*

4 Site Access

The existing site access is located along the C36 roadway. The nearest access to the Tin Mine development is approximately 265 meters to the east along C36. The control at the mine access is free flow along the C36 and stop/priority controlled on the development exit.

There is a boom controlled access along this access road, it is located approximately 500 meters south of the C36 / mine access intersection. The mine used to have a secondary access along the C36, however this access is no longer in use. This secondary access was located approximately 420 meters west from the existing mine access.

Based on video site drive, there were no posted speeds along the C36 roadway for more than a kilometre from the mine access. With the current speed limit of 100km/h along the C36, the required Shoulder Sight Distance at the mine exit should be 200 meters for cars and 300 meters for a single unit truck (based on the Urban Transport Guidelines UTG 1).



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The available SSD at this exit is approximately 240 meters, which is sufficient for cars, but it is insufficient for trucks. In order to improve the safety at this exist, it is recommended to reduce the posted speed limit along the C36 at the mine exit to 80km/h, for at least 1km on either side of the mine access intersection. The required SSD for an 80km/h design speed environment is 240 meters for trucks. With this reduced posted speed limit along the C36 to 80km/h, sufficient SSD would be available.

See **Figure 3** and **Photos 1-2** below for the available Shoulder Sight Distance (SSD).

Figure 3: Shoulder Sight Distance Main Access

Main Development Access	
Photo 1: Eastbound view	**Photo 2:** Westbound view

Street lighting should be installed to improve the safety near the mine access especially at night as the mine operates 24 hours a day 7 days a week and the lighting also provides an easier identification of where the mine is located at night.

5 Existing Operations

The C36 / mine entrance intersection is a "T" intersection, with free flow along the C36 and a stop control on the mine exit, and a single lane on each approach. See **Figure 4** below for the existing lane configuration and traffic control.

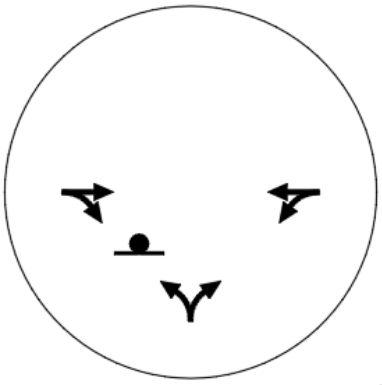

Figure 4: Existing Geometry

The C36 / mine access intersection were surveyed /counted on 18 November 2021. The 2021 Existing Traffic conditions is based on the current intersection geometry / control, as well as the existing traffic volumes. Based on the Existing Traffic capacity analysis results, this intersection currently operates acceptably, from a capacity analyses point of view, with the following results:

- *Level of Service (LOS) A during all peak periods,*
- *Delays less than 10 seconds average during peak periods, and*
- *Volume to Capacity (v/c) ratio less than 5 percent during peak periods.*

The volume to capacity ratio is an indication whether an intersection is operating under- or over capacity. With a very low v/c ratio of less than 5 percent, it means that there is more than 95 percent *spare* intersection capacity currently available. See **Figure 5** for the existing traffic conditions for the weekday AM, Midday and PM peak hours respectively.

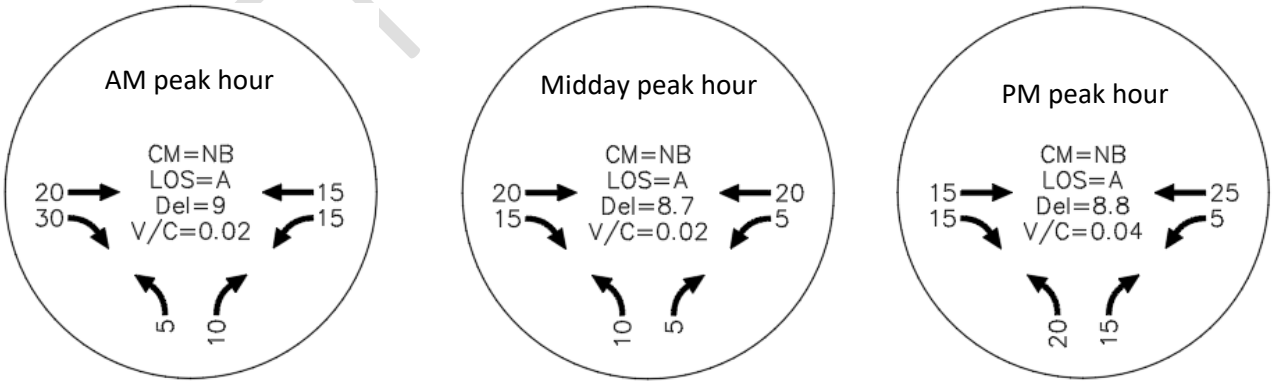

Figure 5: Existing Traffic Operations (***CM = Critical Movement***)

A separate right turn lane to improve safety conditions at this intersection was also evaluated but based on the Access Management Guidelines (AMG) the separate right turn lane is not warranted. It is however recommended to upgrade and re-surface this existing intersection, in order for appropriate road markings and signs to be implemented.

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6 Heavy Vehicles

The current heavy vehicle percentage at the C36 / mine access varies between 4 / 3 percent during the weekday AM / PM peak periods respectively, with 6 percent during the weekday midday peak periods. Currently there is about 12 trucks a day that travel to the C36 / Tin Mine access intersection, of which 4 trucks (30%) enter / leave the Mine. It is expected, with the development upgrades for the mine, the trips will likely increase by approximately 2 additional trucks. This will be evaluated in more detail in the TIA.

7 Public Transport

The current public transport percentage (i.e. Buses) at the C36 / mine access varies between 13 / 11 percent during the weekday AM / PM peak periods respectively. Currently there is about 31 buses a day that travel to the C36 / Tin Mine access intersection, of which 17 buses (55%) enter / leave the Mine.

8 Pedestrians

Near the mine access, the C36 roadway is generally a straight road with a minimum shoulder sight distances of 200 to 250 meters for the pedestrians. Currently more than 250 meters shoulder sight distance is available. Pedestrians may easily cross the C36 roadway due to the low volumes of vehicles travelling along the C36 (less than 100 vehicles in an hour). Pedestrians can walk along C36 roadway in the wide gravel shoulders which is approximately 4 meters wide.

9 Future Operations

This mine currently produces 65 tons of tin final product per month (or 780 tons per annum). It is planned to increase production at this mine to 100 tons of tin per month (or 1 200 tons per annum), which is an approximate increase of 50 percent, based on the current production rate. This scoping report evaluates the impact on the external road network. With this increase in production, it is expected that the trips on the external road network could also increase by as much as 50 percent per day, relative to the current traffic volumes.

The expected impact from this increase in development trips will be evaluated in a full Transport Impact Assessment (TIA) that would be completed early in 2022.

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10 Conclusions and Recommendations

This scoping report outlines the existing operations of the Afritin tin mine in Uis, as well as aspects that should be evaluated in a future detailed Transport Impact Assessment (TIA) as part of the proposed expansion of this mine.

The mine is located southeast of the town Uis, in the Erongo region of Namibia. The main roadways in the site vicinity include the C35, which connects Uis with Hentiesbaai, and the C36, which connects Uis with Omaruru.

Surrounding Roads: The condition of the C36 roadway, near the development, is in a relative poor condition with various spots of cracking and failure. It is recommend that the road be upgraded and resurfaced from a safety- as well as a maintenance point of view. This upgrade should be funded from the developer and the upgrade should be approximately 500 meters on the east and west sides of the mine access along C36.

The Development: The existing tin mine currently produces 65 tonnes of tin per month. As part of the next phase of production, it is planned to increase the output by 50% to 100 tonnes of tin per month.

Site Access: It is recommended to reduce the posted speed limit along the C36 in the vicinity of the mine exit to 80km/h, for at least 1,0km on either side of the mine exist. The required SSD for an 80km/h design speed environment is 240 meters for trucks. With this reduced posted speed limit along the C36 to 80km/h, sufficient SSD would be available. Street lighting should be installed to improve safety near the mine access and this also provides an easier identification of where the mine is located at night.

Existing Operations: The C36 / mine access intersection currently operates acceptably, from a capacity analyses point of view. However, it is recommended to upgrade and re-surface this intersection, in order for appropriate road markings and signs to be implemented.

Heavy Vehicles: Approximately 4 trucks enter / leave the site per day. This is about 30 percent of trucks per day from the total traffic at the C36 / mine access intersection.

Public Transport: Approximately 17 buses enter / leave the site per day. This is about 55 percent of buses per day from the total traffic at the C36 / mine access intersection.

Pedestrians: A minimum of 250 meters shoulder sight distance is available and pedestrians can easily cross the roadway as there is less than 100 vehicles in an hour travelling along C36. Pedestrians can walk along C36 roadway in the wide gravel shoulders which is approximately 4 meters wide.

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Future Operations: The expected impact from this increase in development trips on the C36 / mine access intersection will be evaluated in a full Transport Impact Assessment (TIA) that would be completed in early 2022.

Based on the findings in this scoping report, it is evident that the C36 / mine access intersection currently has sufficient spare capacity. However, the upgrades as discussed above are recommended to ensure safer access operations. The details of these upgrades would be finalised as part of the full Transport Impact Assessment (TIA) that would be completed in early 2022.

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Reference

1. *Committee of Transport Officials. South African Traffic Impact and Site Traffic Assessment Standards and Requirements Manual. TMH 16 vol 2. 2014*
2. *South African Trip Data Manual, TMH17, Version 1.1, COTO, September 2013*
3. *Western Cape Government, Access Management Guidelines, November 2019*
4. *Afritin Mining Limited. Uis Tin Mine, Phase 1 Fast Tracked Stage II Definitive Feasibility Study. Minxcon reference: P2020_030a. April 2021*

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