ENVIRONMENTAL IMPACT ASSESSMENT REPORT
AND
ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

SUBMITTED FOR ENVIRONMENTAL AUTHORISATION IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ATC, 1998 AND THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT, 2008 IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (MPRDA)(AS AMENDED).

NAME OF APPLICANT: NEW LARGO COAL (PTY) LTD

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PHYSICAL ADDRESS: AS ABOVE

FILE REFERENCE NUMBER SAMRAD:MP 30/5/1/2/2/511MR

IMPORTANT NOTICE

In terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002 as amended), the Minister must grant a prospecting right or mining right if among others the mining “will not result in unacceptable pollution, ecological degradation or damage to the environment”.

Unless an Environmental Authorisation can be granted following the evaluation of an Environmental Impact Assessment and an Environmental Management Programme in terms of the National Environmental Management Act (act 107 of 1998)(NEMA), it cannot be concluded that the said activities will not result in unacceptable pollution, ecological degradation or damage to the environment.

In terms of section 16(3)(b) of the EIA Regulations, 2014, any report submitted as part of an application must be prepared in a format that may be determined by the competent authority and in terms of section17(1)(c) the competent authority must check whether the application has taken into account any minimum requirements applicable or instructions or guidance provided by the competent authority to the submission of applications.

It is therefore an instruction that the prescribed reports required in respect of applications for an environmental authorisation for listed activities triggered by an application for a right or a permit are submitted in the exact format of, and provide all the information required in terms of, this template. Furthermore, please be advised that failure to submit the information required in the format provided in this template will be regarded as a failure to meet the requirements of the Regulation and will lead to the Environmental authorisation being refused.

It is furthermore an instruction that the Environmental Assessment Practitioner must process and interpret his/her research and analysis and use the findings thereof to compile the information required herein. (Unprocessed supporting information may be attached as appendices). The EAP must ensure that the information required is placed correctly in the relevant sections of the Report, in the order ,and under the provided headings as set out below, and ensure that the report is not cluttered with uninterpreted information and that it unambiguously represents the interpretation of the applicant.

OBJECTIVE OF THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

The objective of the environmental impact assessment process is to, through a consultative process-

a) determined the policy and legislative context within which the activity is located and document hot the proposed activity complies with and responds to the policy and legislative context;

b) Describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;

c) Identify the location of the development footprint within the preferred site based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment'

d) Determine the-

i) Nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and

ii) Degree to which these impact

(aa). Can be reversed;

(bb). May cause irreplaceable loss of resources, and

(cc). can be avoided, managed or mitigated;

e) Identify the most ideal location for the activity within the preferred site based on the lowest level of environmental sensitivity identified during the assessment;

f) Identify, assess, and rank the impacts the activity will impose of the preferred location through the life of the activity;

g) Identify suitable measures to manage, avoid or mitigate identified impacts; and

h) Identify residual risks that need to be managed and monitored.

REPORT

Draft Environmental Management Programme (EMPr) for the New Largo Coal Project

New Largo Coal (Pty) Ltd.

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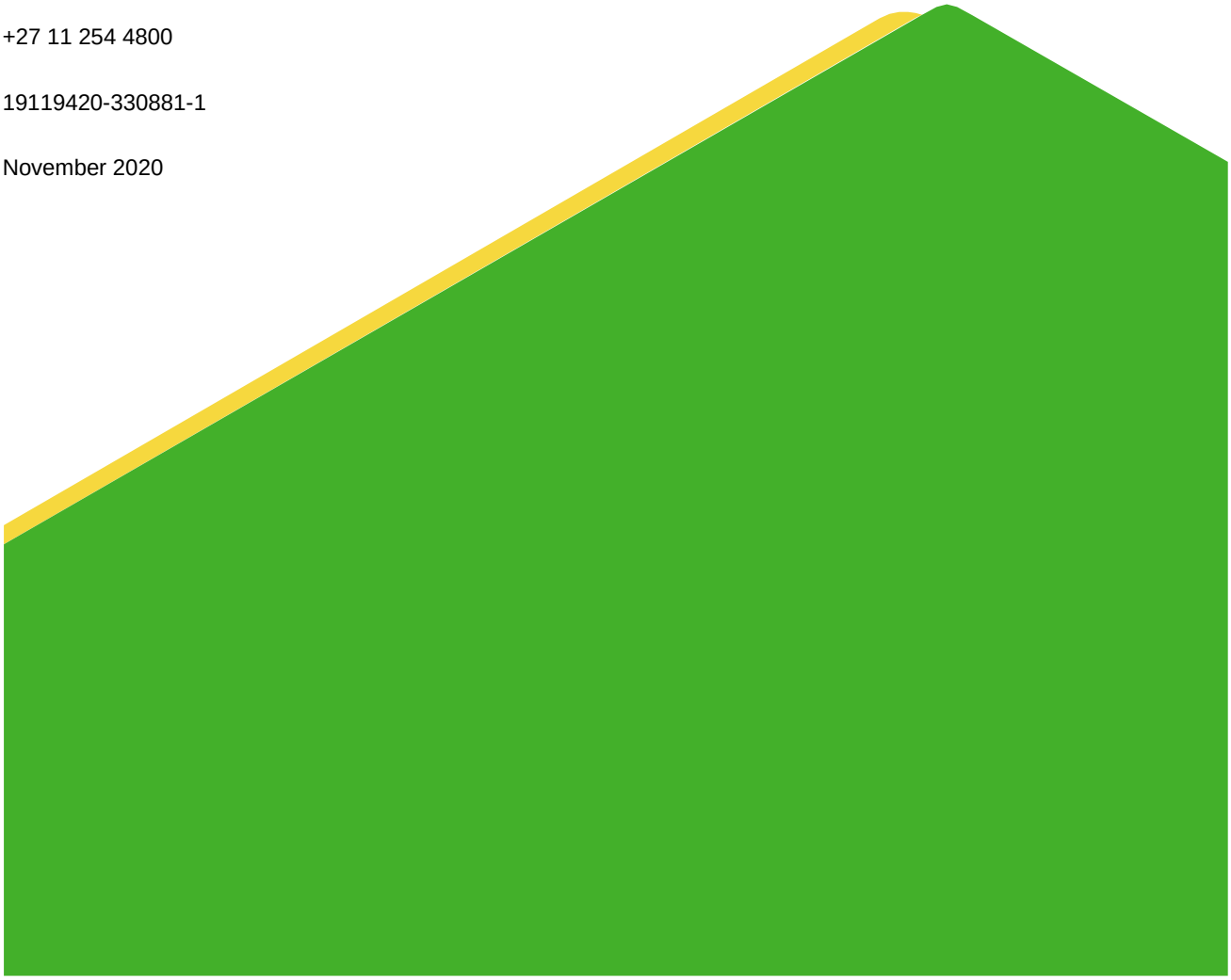

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Executive Summary

New Largo Coal (Pty) Ltd (New Largo), a consortium comprised of Seriti New Largo (45%), the Industrial Development Corporation (22.5%), Coalzar (22.5%) and the New Largo Coal Employee and New Largo Coal Community Trusts (5% each), is the holder of an existing right to mine coal over various farm portions within the Victor Khanye and eMalahleni Local Municipalities, Mpumalanga Province.

The New Largo Coal Mine was previously owned by Anglo American Inyosi Coal (Anglo). Anglo obtained a mining right for the New Largo Coal Mine through an environmental impact assessment (EIA) process undertaken in terms of the National Environmental Management Act 107 of 1998 (NEMA) and the Mineral and Petroleum Resources Development Act 28 of 2002 (MPRDA). The Mpumalanga Department of Economic Development, Environment and Tourism (MDEDET), now Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (M-DARDLEA), granted Anglo an Environmental Authorisation (EA) in 2012. The Department of Mineral Resources (DMR) in 2013 approved the environmental management plan (EMP). Furthermore, the Department of Water and Sanitation (DWS) issued three Water Use Licences (WULs) between 2013 and 2015. Thereafter, Anglo put the New Largo Coal Mine project on hold and submitted requests for extension of the validity of the authorisations to the Regulators.

New Largo Coal (Pty) Ltd acquired the New Largo Coal Mine Project from Anglo in August 2018 and subsequently commissioned a Bankable Feasibility Study (BFS) of Pit H to re-evaluate the deposit as a standalone mining operation, and a separate BFS for the remainder of the mine (referred to as the Main Mine). New Largo Coal now proposes to amend the original mine schedule to commence mining of Pit H and Pit D at an earlier date than the timeframes stipulated in the original mining schedule. This earlier schedule will require the development of some infrastructure in locations other than those specified in the EMP and WUL, including an offloading facility and link to the Kusile Main Feed conveyor at the mine's boundary with Kusile Power Station. Pit D will be mined through from the adjacent Klipfontein Colliery. The coal mined from Pit D and Pit H will be trucked to Kusile Power Station and other end users.

To give effect to these proposed changes, New Largo must apply for amendments to its approved EA and prepare an updated EMPr. New Largo must also apply for a WUL to accommodate additional water uses not previously authorised by the DWS.

New Largo has appointed Golder Associates Africa (Pty) Ltd (Golder), an independent environmental assessment practitioner, to undertake the EA/EMPr amendment process and WULA.

Key changes to existing authorised project

The following key changes to the existing authorised project are being applied for via the amendment application:

- The planned commencement of mining is now through Pit D and Pit H, which per the original Life of Mine (LOM) plan, were to be mined at later stages.
- Because mining is now starting at Pit H, the following infrastructure is necessary to support mining at this location (since the authorised main mine infrastructure area and beneficiation plant will now also only be developed at later stages):
- Mobile in-pit crusher infrastructure, including haul roads, access roads, product stockpiles, destoning plant, Pollution Control Dams (PCDs) with a silt trap for dirty water management. Reject material from the destoning plant will be backfilled into Pit H as part of the approved rehabilitation plan.

- The extent of Pit D has been defined. No new infrastructure is required; this pit will be mined through from the neighbouring Africoal SA (Pty.) Ltd. pit, whose existing infrastructure will be used to support mining at Pit D.
- The overland conveyor system will not be constructed until later in the project lifetime. Instead, coal will be trucked from Pits D and H.

Phase 0 has been added to the Project which entails the construction of an offloading facility and link to the Kusile Main Feed conveyor adjacent to Kusile Power station, as well as the (authorised) northern access road.

The amendment to the mine schedule and development of additional infrastructure will enable New Largo to access higher grade coal reserves at an earlier stage of the life of mine than envisaged in the original mine plan. This is essential as coal currently provides for most of South Africa's primary energy needs. The target destinations are expected to be Eskom (Kendal and Kusile Power Stations) and other power producers within South Africa but may vary as market conditions dictate from time to time. The mine will potentially contribute to the reduction of the domestic shortfall of coal, helping Eskom to ensure a sustainable supply of power, which the South African economy depends on.

Key findings of the impact assessment

The following key potential negative impacts are associated with the proposed changes:

- Impacts on air quality and noise levels due to the construction and operation of the destoning plant at Pit H, trucking of coal to end users (customers), as well as from the new offloading facility.
- Impacts on terrestrial ecology, soil and heritage resources as a result of the additional infrastructure required at Pit H, e.g. PCDs, workshops, offices, destoning plant, etc.
- Impacts on traffic on local roads as a result of trucking coal from Pits D and H to Eskom (Kendal and Kusile Power Stations) and other power producers.
- Impact on the water balance of the mine as a result of mining through the barrier pillar between Pit D and Klipfontein Colliery.

The necessary specialist studies have been conducted to assess the impacts of the proposed changes. The environmental baseline conditions (where relevant to the proposed changes) have also been updated as part of the specialist studies, since the original studies were conducted in 2012 and in some case are considered to be outdated. The key findings of the specialist studies can be summarised as follows:

- Air quality:
  - There has been significant changes in the emission sources within the project area since the original 2012 EIA, especially in terms of mining and power generation activities in the study area.
  - The distribution of sensitive receptors within the local area have remained relatively unchanged since 2012 other than natural expansion and growth of the residential areas over time.
  - Most of the individual farm residences remain throughout the MRA.
  - The only "new" significant sensitive receptor identified is the informal settlement behind Vlakfontein mine and adjacent to the R545. This community originated from the old farm workers accommodations pre 2012 and has subsequently become an informal settlement over the last eight years.
  - During the Operational Phase, it is anticipated that impacts on air quality at sensitive receptors due to the trucking of coal on unpaved haul roads will be of **Moderate** significance, but could be mitigated to

Low should the appropriate measures, such as application of reduced speeds on unpaved roads and wet dust suppression, be implemented.

- The destoning plant is anticipated to make a **Moderate** contribution to the PM10 concentration and dust fallout levels at nearby sensitive receptors. With the implementation of suitable mitigation measures (i.e. surrounding the plant with berms and installation of mist dust suppression systems, etc.), the impacts could be reduced to **Low**.
- There will be a **Moderate** impact regarding Greenhouse Gas (GHG) emissions released from the project associated with the trucking of coal compared to the conveying of coal due to the significant increase in hydrocarbon fuel usage on site which will increase the operation's cumulative carbon footprint.

- Noise:
  - Changes in the land use noise sources within a 10 km radius of the project area are likely to have occurred between 2012 and 2020, due to expansion of the power generation activities (Kusile Power Station), residential areas, and individual mining and/or industrial activities – and associated vehicular traffic.
  - The distribution of sensitive receptors within the local area have remained relatively unchanged since 2012 other than natural expansion and growth of the residential areas over time. Most of the individual farm residences remain throughout the MRA; and the only "new" significant sensitive receptor identified is the informal settlement behind Vlakfontein mine and adjacent to the R545. This community originated from the old farm workers accommodations pre 2012 and has subsequently become an informal settlement over the last eight years.
  - During the Operational Phase, it is anticipated that the increase in the baseline noise levels associated with the trucking of coal off site at nearby sensitive receptors along the road corridor will result in impacts of Moderate significance. Impacts are likely to be experienced within a few hundred meters of the corridor. Due to the number of anticipated trips per day, the impacts are anticipated to remain **Moderate** even with the implementation of suitable mitigation measures.
  - There will be a **Moderate** impact regarding an increase in the baseline noise levels associated with Pit H surface infrastructure, including the destoning plant, which is anticipated to be a significant local noise source. With the implementation of suitable mitigation measures, such as application of screens / berms to reduce the noise impacts, the impact is anticipated to be of a Low significance.
- Heritage:
  - The cultural landscape qualities of the region essentially consist of two components. The first is a rural area in which the human occupation is made up of a limited pre-colonial (Stone Age and Iron Age) occupation. The second component is a much later colonial (farmer) one, most of which developed during the last 150 years or less. Recently it gave rise to large-scale mining developments.
  - The Phase 1 heritage impact assessment revealed that no sites, features or objects of cultural significance were identified at Pit H and Pit D.
- Palaeontology:
  - All Karoo Supergroup geological formations are ranked as low to very high sensitivity, and within the study area the impact is potentially very high for the Vryheid Formation. Fossils likely to be found are mostly plants such as 'Glossopteris flora' of the Vryheid Formation. The aquatic reptile Mesosaurus

and fossil fish may also occur with marine invertebrates, arthropods and insects. Trace fossils can also be present.

- No fossils were recorded during the Phase 1 palaeontology impact assessment. It is anticipated that the construction phase activities will have no impacts on palaeontological resources, but it is always possible that chance find fossils could be unearthed when construction related activities (e.g. digging, drilling, blasting and excavating of foundations, trenches, channels and footing and removal of overburden) are being undertaken. In such an event the chance find procedure must be implemented.

- Visual:
  - The visual study area is characterised by a mosaic of undulating grasslands, crop fields and sites completely transformed by mining and associated activities. Accordingly, the study area is visually complex and has an overall low visual resource value. Negative impacts on the visual setting from mining have increased since the 2012 baseline characterisation.
  - The proposed developments at Pit D, Pit H and Phase 0 will have negative impacts on the visual environment. These centre on the physical presence of infrastructure, stockpiles, dust generation and lighting. It is anticipated, however, that these impacts will be largely 'absorbed' by the prevailing transformed and operational character of the study area, and are thus rated as having Low significance.
- Terrestrial ecology:
  - The development footprint of Pit D comprises mostly cultivated fields, large areas of grassland, and alien tree stands. The cultivated fields are under soy production. Most areas of grassland have been disturbed and are characterised by secondary grassland of the tall dry grassland on sandy midslopes community, dominated by the tall thatching grass Hyparrhenia hirta, with Aristida congesta and Pogonarthria squarrosa also commonly observed species.
  - The characteristics of land associated with the proposed infrastructure footprints of Pit H have not changed since the initial baseline was conducted in 2012. The pit footprint and most of the adjacent land where proposed infrastructure will be located consists of cultivated maize fields. Small patches of managed pasture, and non-cultivated areas of secondary grassland of the tall moist grassland on seldom waterlogged footslopes community, alien tree stands and wetland (tall wet grassland on regularly waterlogged footslopes) are also present.
  - None of the Red Listed or Protected Flora previously recorded in the New Largo MRA were identified in the Pit D or Pit H areas during the supplementary field survey conducted in July 2020.
  - The remaining areas of natural habitats in the New Largo MRA are of importance in maintaining ecological services and function within the landscape. They support varied ecological communities, some of which have the potential host to restricted (geographically) animal assemblages and communities, that are considered to be important for the conservation of biodiversity in the study area. In particular, the high-lying rocky shrubland supports a highly-localised and nationally Vulnerable plant species, Frithia humilis; an indication of the biological importance of the habitat type in the study area and region. This part of the MRA has also been identified as a Critical Biodiversity Area, that is classified as Irreplaceable – as such, any losses of this habitat should be avoided, as offsets are not considered appropriate in situations where irreplaceable biodiversity would be adversely impacted, as stipulated in the draft National Biodiversity Offset Policy.
  - The inclusion of additional infrastructure, including a destoning plant adjacent to Pit H, and a previously unplanned offloading facility and conveyor connection adjacent to Kusile (Phase 0), will result in a slightly larger infrastructure footprint within which construction activities will take place. Although the

cumulative infrastructure footprint is larger, the infrastructure will be constructed in an area currently occupied by maize fields; therefore, no additional impacts of loss, disturbance and fragmentation of terrestrial ecosystems and biodiversity to those already assessed are anticipated.

- Potential impacts associated with the operation of the offloading facility and conveyor connection adjacent to Kusile (Phase 0) relate to the effects of dust deposition on terrestrial ecosystems and biodiversity. Although the amount of dust being generated may increase, the area where the facilities will be developed are currently under maize, and sensitive terrestrial ecosystems such as the high lying rocky shrubland community are located beyond the area within which any potential contamination may occur; therefore, no additional dust impacts on terrestrial ecosystems and biodiversity to those already assessed are anticipated.
- The operation of the destoning plant at Pit H will result in an increased level of disturbance to terrestrial biodiversity to that already assessed for mining activities such as drilling and blasting; however, in the context of the location of the destoning plant in lands currently under maize, and adjacent to the existing N12 road and Mzimkhulu mining operation, no change in the magnitude of the impact is expected and no change in the significance of the impact of mining activities on terrestrial ecosystems and biodiversity to those already assessed are anticipated.

- Aquatic ecology:
  - The New Largo MRA is dominated by cultivated fields, with natural and semi-natural habitat in the form of grassland, wetlands and alien species woodlots confined to small and fragmented areas. Although water quality has deteriorated downstream of the Kusile Ash Dump, and downstream of the Phola wastewater treatment plant, no significant changes have occurred to the general baseline condition of the aquatic ecosystems and associated aquatic faunal species within the MRA since the 2012 impact assessment.
  - The inclusion of infrastructure, including a destoning plant, adjacent to Pit H, and a previously unplanned offloading facility and conveyor connection adjacent to Kusile (Phase 0), will result in a slightly larger infrastructure footprint within which construction and operational activities will take place. However, since the infrastructure will be constructed in an area currently occupied by maize field, no additional impacts of loss, contamination and fragmentation of aquatic ecosystems and biodiversity to those already assessed in 2012 are anticipated, and provided that the originally-recommended mitigation measures are implemented, no additional mitigation measures are considered necessary.
- Wetlands:
  - From a construction perspective, the development of infrastructure, including a destoning plant, adjacent to Pit H, will result in a larger infrastructure footprint within which construction and operation activities will take place. Although the infrastructure is sited in an area that is currently occupied by maize fields, wetness signatures were detected in the area and an additional approximately 4.8 ha of hillslope seepage wetland will be directly affected (lost) due to construction and operation of the infrastructure. These losses have been taken into account in the updated wetland mitigation strategy for the mine.
  - The extent of Pit D has increased westwards compared to the 2012 impact assessment; this will result in the loss of an additional 13 ha of isolated hillslope seepage wetland habitat. These losses have been taken into account in the updated wetland mitigation strategy for the mine.
  - The development of the Phase 0 infrastructure will include the construction of the (already authorised) access road across an area of hillslope seepage wetland that is currently occupied by maize fields.

Since this impact was included in the previous 2012 impact assessment, no additional impacts for the Phase 0 infrastructure were identified during this assessment.

- From an operational perspective, potential impacts associated with the operation of the offloading facility and conveyor connection adjacent to Kusile (Phase 0) relate to the effects of dust deposition on wetlands. Although the amount of dust being generated may increase, the wetland in proximity to the area where the Phase 0 facilities will be operating is currently under maize, and sensitive wetland ecosystems unaffected by mining are located beyond the area within which any potential contamination may occur; therefore, no additional dust impacts on wetland ecosystems to those previously assessed are anticipated.
- No new impacts on wetland ecosystems as a result of the operational phase activities associated with mining at Pit D and Pit H were identified.

- Soil:
  - For the most part, the baseline situation at Pit D and Pit H remained unchanged since the previous (2006) soil assessment. As with the 2006 baseline study, Hutton, Clovelly and Westleigh at Pit H, and Clovelly/Hutton at Pit D, were identified during the updated study. Mispah soil forms were however, identified at the Pit D and Pit H footprints which might be prone to erosion if not properly handled or managed.
  - Arable land is the dominant land capability for both Pit H and Pit D footprints. The land use for both Pit H and Pit D is agriculture as observed during the baseline survey conducted in 2006.
  - The increased footprint associated with the operational infrastructure as per the new mine layout at Pit H will sterilise additional soils. This is considered to be an impact of **Moderate** significance, which could be reduced to **Low**, provided the footprint is rehabilitated during the Decommissioning Phase.
  - The impacts previously determined for Pit D and Phase 0 areas were found to be unchanged, since the supporting infrastructure for Pit D will be from the nearby mine, and the Phase 0 infrastructure footprint was largely included in the original authorised project.
  - The contamination of soils as a result of dust distribution and fallout on the unpaved trucking routes and use of impacted water for dust suppression, is expected to result in an impact of **Moderate** significance, but could be reduced to **Low** provided the EMPr measures related to Dust control, Soil Management and Erosion Protection, Spill prevention, Response and clean-Up, Machinery, Vehicle Movement and Roads, are implemented.
- Traffic:
  - The predicted traffic impact as a result of the New Largo coal trucking contribution to the existing peak hour situation is expected to be of a **Low** significance prior to mitigation.
  - For the future 2030 scenario, it is predicted that road capacity upgrading will be required shortly after year 2030; however no mitigation measures are required by New Largo Coal from a capacity and operational point of view, since the impact on traffic that will be generated by the New Largo Coal Project in the future 2030 scenario was also assessed as being of **Low** significance.
- Surface water:
  - The updated baseline results indicate that there has been a deterioration of water quality in both the Wilge River and Saalklapspruit over the past 8 years, with increased upstream development.

- The infrastructure at Pit H and Phase 0 will be constructed in the areas where no watercourses exist, therefore no additional impacts on surface water during the Construction Phase to those already assessed are anticipated.
- The operation of the offloading facility and conveyor connection adjacent to Kusile (Phase 0) will generate dust, however, since there are no sensitive water resources located beyond the area within which any potential contamination may occur, no additional impacts on surface water resources are anticipated as a result of this activity.
- The operation of the destoning plant at Pit H will not result in increased impacts to the water resources. Two lined pollution control dams will be constructed at Pit H to manage contaminated runoff from the plant, seepage from the overburden stockpiles and excess water make pumped from the mine workings. Water in these dams will be used for dust suppression on haul roads. Evaporation paddocks will also be located on the downslope side of the overburden stockpiles to capture surface water runoff from these facilities.
- A water balance was developed for Pit H. The results were used to determine the water storage capacities for the PCD's and evaporation paddocks. The results also indicated that a maximum pumping rate of 10 000 m3/d will be required from the pit workings to the PCD 2 to ensure flooding does not occur. This will ensure that the in-pit sump is managed effectively to not impede mining activities.

- Groundwater:
  - The construction of the Phase 0 infrastructure will require a borehole supplying back-up water, to supplement/replace the Eskom water supply, if needed. However, this impact was assessed in the original 2012 groundwater impact assessment, and hence no further mitigation is proposed.
  - Mining through the barrier pillar at Pit D will result in an increased volume of excess mine water that will need to be managed as part of the Operational Phase water balance. This is considered an impact of **High** significance.
  - Mining through the barrier pillar at Pit D will result in an increase in mass load to groundwater quality, as a result of increased mine water ingress into Pit D, which should be managed and treated, as part of the main mine water management strategy. This is considered an impact of **High** significance.
  - The Pit H northern perimeter straddles the east-west aligned sub-catchment divide, therefore continued upgradient groundwater inflow to the pit is going to be negligible once mining has progressed in a generally down-gradient (southerly and easterly) direction as indicated by the latest mine plan. The pit spoils and rehabilitated areas behind the active box-cut will, however, increasingly receive direct recharge which will migrate through the spoils towards the active box cut and will need to be dewatered via a sump or possibly multiple sumps. This direct recharge has been included in the Pit H pit water balance calculations. This is considered an impact of **High** significance.
  - There is no material change in the geochemical impact of Pit D as a result of the proposed changes in mining schedule or mine plan.
  - The backfilling of reject material from the destoning plant into Pit H as part of the rehabilitation plan is unlikely to change the Pit H mine water quality previously identified in the 2012 studies.
  - Impacts on mine water quality will be managed through the below listed actions, as per the 2012 EMP:
  - Decreasing seepage post-closure through the use of a cover over the rehabilitated pit (cover design to be developed nearer to pit closure when rehabilitated pit final landform is available);

- Interception of pit water to prevent decant; and
- Treatment of intercepted pit water.
- The Pit H spoils (which will affect the chemistry of mine water removed from the pit for management and the PCD water quality) are assessed as Type 3 waste and classified as hazardous (environment).
- Reject material from the destoning plant is assessed as Type 3 waste and classified as hazardous (human health and environment).
- The potential impacts on the groundwater resource as a result of the mining of Pit H and Pit D, and decommissioning of supporting infrastructure in the northern region of the MRA (Phase 0), are largely covered in the original 2012 impact assessment.
- The recent (2019) groundwater model update, which incorporated the potential impacts of the Pit D extension, indicates a total predicted post closure decant rate of around 3.71 ML/d at several decant locations, generally located at the edge of the backfilled areas next to pre-mining drainage courses and associated wetlands, i.e. topographic lows. Any water decanting at the edge of the backfilled areas might pond at these locations, form surface runoff or re-infiltrate into the ground; however, predicted decant rates should be revisited once a post-closure elevation model becomes available.

- Socio-economic:
  - The project changes will not adversely influence the overall **Positive** impacts of the mine. These **Positive** effects are as follows:
    - The project will lead to increased business opportunities for local and regional suppliers. Most of the community members around New Largo live below the poverty threshold and may benefit from increased business and job opportunities. This benefit will also have an impact outside the mining area.
    - New Largo will encourage the employment of local community members and where appropriate develop their skills (as part of the SLP process) to a point where incomes will increase based on improving qualifications. The process may lead to an increased housing need and a rise in prices for accommodation in the area. The skills development will take place during commissioning, operation and continue to closure.
    - There is an expectation that New Largo will employ youth and women in Kendal, Wilge and New Largo areas. This expectation needs to be carefully managed and planned as part of the Social and Labour Plan's Skill Development Plans. The process needs to start immediately with a skills audit to determine the skills and qualification level in these communities.
  - Several adverse impacts have emerged due to the proposed project changes. These implications are causally related to the decision to start mining with Pit D and H and to truck coal, as the overland conveyor system will not be constructed until later in the project lifetime.
    - Coal will be trucked from Pits D and H to the destinations. There will be 275 truckloads of 32 tonnes each per working day (average 25 days per month) initiated from Pit D, and 250 truckloads from Pit H. Indications are that this load will be carried on sections of the R545, R555, and R960/686. At 475 truckloads per working day, this represents a notable increase in average traffic load. The potential impact is considered to be of **High** significance from a social perspective prior to mitigation; the residual impact is of **Moderate** significance.

- New Largo has changed the mine plans and reviewed the relocation processes and priority areas. These changes have led to uncertainty in terms of exact relocation timeframes for the New Largo Pit H, and Pit D affected community. New Largo did indicate that the first 10 years of operation would not result in any further relocation of people. However, there is still uncertainty regarding the relocation process, priority areas and overall timeframes. If not addressed, such a scenario could result in adverse human rights impacts. The potential impact is considered to be of **Moderate** significance from a social perspective prior to mitigation; the residual impact is of **Low** significance, since New Largo will conduct a resettlement action plan (RAP) to determine people which communities will be affected and when.
- There is an enduring perception that mining causes severe health hazards such as asthma and lung disease. The New Largo communities raised some concerns around the health and safety of the community. The potential impact is considered to be of **Moderate** significance from a social perspective prior to mitigation; the residual impact is of **Low** significance.
- There is a concern that blasting might impact on groundwater quality and volumes. This is an issue for communities that rely on borehole water supply. The potential impact is considered to be of **Moderate** significance from a social perspective prior to mitigation; the residual impact is of **Low** significance.
- Livelihood restoration aspects require more attention. This aspect was raised during the stakeholder consultation process. Livelihood restoration is a concern not only due to the implications of the project changes but also for the overall mine. The potential impact is considered to be negative and of **Moderate** significance from a social perspective prior to mitigation; the residual impact is expected to be of **Positive** significance.

The original, authorised EMPr has been revised to reflect the recommendations made in the updated specialist studies.

Aspects for inclusion as conditions of Authorisation

General Conditions

New Largo must:

- Implement all aspects of the EMPr in sections Part B of this document;
- Comply with all relevant legislation at all times;
- Undertake annual internal auditing of environmental performance and annual reporting to the DMRE, in line with the EMP commitments; and
- Undertake biennial external auditing of environmental performance and provide the DMRE with a copy of the audit report, in line with the EMP commitments.

Site Specific Conditions

Over and above the conditions contained in the original EA/EMPr, the following must be complied with:

Noise:

- The destoning plant infrastructure must be developed in such a manner such that the waste rock dumps act as screens to reduce the noise impacts at nearby sensitive receptors. If such layouts cannot be accommodated, then suitable earth berms must be constructed to reduce the noise impacts at nearby sensitive receptors.

Air quality:

- Wet suppression on unpaved trucking routes;
- Tarpaulin load covering, where possible, to prevent the generation of fugitive dusts while trucking on public roads;
- Suitable mitigation measures should be implemented on and/or at the destoning plant to mitigate the generation of fugitive dust and fine particulate emissions. These may include the following:
- Surrounding the plant with suitable berms to act as a screen; and
- Install dust mist suppression sprays to knock out the dust at source on the destoning plant.

Terrestrial ecology:

- The current extent and condition of the habitats where F. humilis was previously identified, and the likelihood of similar rocky ridge habitat in the MRA to support F. humilis, should be determined via a survey conducted by a suitably qualified/experienced botanist in the flowering season (wet season 2021). Areas where the species occurs should then be marked out and fenced off as necessary, to ensure that no further loss or disturbance of this species takes place.
- In the event that the in-situ conservation of F. humilis is considered at risk from previous mining operations, options for the harvesting of seed of the species for propagation, or translocation, must be defined and agreed with the relevant permitting authorities (e.g. SANBI, Mpumalanga Parks and Tourism Agency).
- A Biodiversity Action Plan that describes and schedules the required conservation actions for F. humilis and all remaining areas of natural habitat (high lying rocky shrubland, dry/moist/wet grassland, wetlands) within the New Largo MRA must be developed and implemented for the project prior to the commencement of mining.

Groundwater:

- Additional mine water generated from mining through the barrier of Pit D must managed by New Largo to ensure no mine affected water is released to the surrounding environment.

Social:

- The mitigation measures provided in the EMPR (Section Machinery, Equipment, Vehicle Movement and roads) addressing the potential safety and intrusion aspects relating to the trucking of coal on public roads must be adhered to, including transport contractors.
- Develop a livelihood restoration framework. The focus should not only be on eventual livelihood restoration, but also on resolving emerging project-related livelihood implications, including subsistence farming impacts.

<u>Reasoned opinion as to whether the proposed activity should or should not be authorised</u>

Provided that all the environmental management measures described in this amendment to the EA/EMPr are applied diligently, it is expected that the proposed changes to the approved EA/EMPr will not result in any environmental impacts that cannot be mitigated to acceptable levels.

Not granting this authorisation will result in the benefits of the project to New Largo Coal and to local residents not being realised.

Accordingly, it is the opinion of the environmental assessment practitioner that the application for EA/EMPr amendment to enable New Largo to undertake the activities described in this amendment to the EA/EMPr should be granted.

Abbreviations and acronyms

Abbreviation/Acronym	Explanation
Africoal	Africoal SA (Pty) Ltd SA
Anglo	Anglo American Inyosi Coal
BFS	Bankable Feasibility Study
BID	Background Information Document
Ca	Calcium
CAPEX	Capital Expenditure
CHPP	Coal Handling and Processing Plant
Cl	Chlorine
CRR	Comments and Response Report
CV	Calorific Value
DMRE	Department of Mineral Resources and Energy
DWS	Department of Water and Sanitation
EA	Environmental Authorization
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EHS	Environmental, Health, and Safety
EIA	Environmental Impact Assessment
EIS	Environmental Importance and Significance
ELM	eMalahleni Local Municipality
EMPr	Environmental Management Program
EWR	Ecological Water Requirements
F	Fluorine
FGD	Flue-gas Desulphurisation
GAA	Golder Associates Africa
GIIP	Good International Industry Practice
HCO_3	Bicarbonate
HPA	Highveld Priority Area
I&APs	Interested and Affected Parties
IFC	International Finance Corporation
IRP	Integrated Resource Plan
JMA	Jasper Muller and Associates

Abbreviation/Acronym	Explanation
LoM	Life of Mine
MAE	Mean Annual Evaporation
MAR	Mean Annual Run-off
MBSP	Mpumalanga Biodiversity Sector Plan
MDEDET	Mpumalanga Department of Economic Development, Environment and Tourism
Mg	Magnesium
MRA	Mining Rights Area
NAAQS	National Ambient Air Quality Standard
NDM	Nkangala District Municipality
NEM: WA	National Environmental Management: Waste Act
NEMA	National Environmental Management Act
New Largo	New Largo Coal (Pty) Ltd
NO_2	Nitrogen Dioxide
NWA	National Water Act
O_3	Ozone
PES	Present Ecological State
pH	Power of Hydrogen
PM_{10}	Particulate Matter of an Aerodynamic Diameter of 10 microns
RO	Reverse Osmosis
RoM	Run of Mine
RQO	Resource Quality Objectives
SANBI	The South African National Biodiversity Institute
SANS	South African National Standard
SO_2	Sulphur Dioxide
TDS	Total Dissolved Solids
WHO	World Health Organization
WQPL	Water Quality Planning Limits
WTP	Water Treatment Plant
WULs	Water Use Licences

Units of Measurement

Unit	Description
cm	Centimetre
ha	Hectares
km	Kilometres
kPa	Kilopascal
L/s	Litres per Second
m	Metre
m/s	Metres per Second
m^3/d	Metres Cubed per Day
mamsl	Metres above Mean Sea Level
mbgl	Meters below Ground Level
ML	Million Litres
Mm	Million Metres
mm	Millimetre
Mt	Million Tons
^oC	Degrees Celsius
ppm	Parts per Million
ppm	Parts per Million
v/c	Volume/Capacity
µg/ℓ	Microgram per Litre
L/s	Litres per Second

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APPENDICES

Part A
Scope of Assessment and Environmental Impact Assessment Report

1.0 INTRODUCTION AND BACKGROUND

Mining of the New Largo Coal reserve, previously owned by Anglo American Inyosi Coal (Anglo), is authorised through an Environmental Impact Assessment (EIA) process under the requirements of the National Environmental Management Act (NEMA) and the Mineral and Petroleum Resources Development Act (MPRDA). The Environmental Authorisation (EA) was issued by the Mpumalanga Department of Economic Development, Environment and Tourism (MDEDET) in 2012, and the Environmental Management Programme (EMPr) was approved by the Department of Mineral Resources and Energy (DMRE) in 2013. Furthermore, the Department of Water and Sanitation (DWS) issued three Water Use Licences (WULs) between 2013 and 2015. Thereafter, Anglo put the New Largo Coal Mine project on hold due to commercial agreements with Eskom that had not been concluded and submitted requests for extension of the validity of the authorisations to the Regulators.

New Largo Coal (Pty) Ltd. (New Largo) acquired the New Largo Coal Mine project from Anglo in August 2018 and subsequently commissioned a Bankable Feasibility Study (BFS) of Pit H to re-evaluate the deposit as a standalone mining operation, and a separate BFS for the remainder of the mine (referred to as the Main Mine). New Largo now proposes to amend the original mine schedule to commence mining of Pit H at an earlier date than the timeframes stipulated in the original mining schedule. This earlier schedule will require the development of some infrastructure not previously included in the EMPr. In addition, mining at the New Largo Pit D will commence sooner than originally planned. Pit D will be mined by Africoal SA (Pty) Ltd SA (Africoal), on behalf of New Largo, as an extension to their adjacent Klipfontein Colliery. The coal mined from Pit D and Pit H will be trucked to Kusile Power Station and other end users. In addition, New Largo will be implementing a product coal off-loading facility with associated required conveyor flights to convey coal to the Kusile coal stockpiling area. This infrastructure was largely included in the original project design; only the position, layout and timing of construction will change.

To give effect to these proposed changes, New Largo must apply for amendments to its approved EA and as such have requested Golder Associates Africa (Pty) Ltd. (Golder) to assist with the EMPr amendment process. The EMPr needs to be amended through a Part 2 (substantive) amendment in terms of the EIA Regulations (GN R. 326) (as amended). As part of the amended application, the potential impacts of the temporary infrastructure to be constructed at Pit H will need to be assessed.

2.0 CONTACT PERSON AND CORRESPONDENCE ADDRESS

2.1 Details of the Proponent

For the purposes of this project, the following person can be contacted at New Largo:

Table 1: Details of the proponent

Details	Description
Company Name:	New Largo Coal (Pty) Ltd.
Company Registration Address:	3 on Glenhove, Cnr Glenhove and Tottenham Avenue, Melrose Estate, Johannesburg, 2196, South Africa.
Telephone number:	011 047 7000
Contact Person Details	
Contact person:	Nicola Torley
Telephone:	011 047 7000
Email:	Nicola.torley@seritiza.com
Alternative contact person:	Pavan Rajlal
Telephone:	011 047 7043
Email:	pavan.rajlal@seritiza.com

2.2 Details of the Environmental Assessment Practitioner (EAP)

Golder is a member of the world-wide Golder Associates group of companies, as a 100% employee-owned group since its formation in 1960, Golder has created a unique culture with pride in ownership and a commitment to providing technically sound and cost-effective consulting and contracting services primarily in environmental and geotechnical services. Experiencing steady growth for nearly 60 years, Golder now has more than 7,500 dedicated professionals operating from more than 155 offices, in more than 40 countries worldwide. We serve our Clients as a globally connected community that shares knowledge to deal with technical issues requiring innovative approaches. Golder has offices in Midrand, Maputo and Accra. Golder has more than 300 skilled employees and is able to source additional professional skills and inputs from other Golder offices around the world.

For purposes of this EMPr Amendment application, the following persons may be contacted at Golder.

Name of Consultants

Name:	Golder Associates Africa (Pty) Ltd.
Address:	PO Box 6001, Halfway House, 1685
Environmental Assessment Practitioner:	Olivia Allen (Senior Environmental Practitioner) Email: OAllen@golder.co.za The full CV is provided in APPENDIX A
EAPASA Registration No:	2019/1725
Public Participation Specialist:	Brian Magongoa (Public Participation Specialist) BMagongoa@golder.co.za

2.2.1 Expertise of EAP

2.2.1.1 Qualifications of EAP

2.2.1.1.1 Education

- B.Sc. (cum laude) Zoology and Geography – University of the Free State (Bloemfontein);
- B.Sc. (Hons) (cum laude) Geography – University of the Free State (Bloemfontein); and
- M.Sc. Water Resource Management - University of Pretoria.

2.2.1.1.2 Professional Affiliations

- EAPASA Registered EAP (Ref. No. 2019/1725).

2.2.1.2 Summary of past experience

Olivia Allen has 15+ years' experience in the discipline of Environmental Sciences. Olivia specialises in environmental assessment, regulatory compliance, waste planning and integrated project management.

As a senior consultant, Olivia has successfully led, or been part of, various projects in the mining sector of coal, gold, diamonds, copper and platinum, the petroleum sector of gas extraction, and steel, ferrochrome and electrolytic manganese dioxide industrial sectors. She has extensive experience in mine water treatment related projects and has exposure to mine closure and rehabilitation related projects.

In the past, Olivia has functioned in various roles within the Golder technical stream, including report writing; project management, such as facilitation of meetings, budget control, scheduling and invoicing; and working closely with engineering teams and regulatory authorities to ensure successful project integration and outcomes.

Her environmental technical competencies include the following:

- Conducting Environmental Impact Assessments and compiling Environmental Management Plans;
- Development of Integrated Waste Management Plans;
- Compiling Water Use and Waste Management Licence Applications;
- Stakeholder engagement, including Regulatory Authorities;
- Co-ordination of Integrated Regulatory Processes; and
- Environmental Compliance Assessment and Auditing.

2.2.2 Declaration of Independence

Golder has no vested interest in the proposed project and hereby declares its independence as required by the EIA Regulations.

3.0 PROJECT DESCRIPTION

3.1 Overview of New Largo Coal

New Largo Colliery lies between the N4 and N12 national freeway, some 30 kilometres west of eMalahleni and 100 kilometres east of Johannesburg in the Mpumalanga Province. The full extent of the New Largo Mining Rights Area (MRA) extends from the N4 (Pretoria-Witbank National Road) to the south of the N12 (Johannesburg-Witbank National Road). Pit H is located within a satellite basin, separated from the wider New Largo coal deposit by the N12 road, whilst Pit D is located north of the N12 in close proximity to the New Largo coal deposit (Figure 1). The New Largo mine is intended to be the base coal supply to Eskom's Kusile Power Station, and as such, the Power Station was located immediately adjacent to the west/north-west of the mine.

Mining of the New Largo Coal reserve, previously owned by Anglo, is authorised through an EIA process under the requirements of the NEMA and the MPRDA. The EIA for New Largo Colliery, which included the Main New Largo Mine, was completed, and submitted in 2012 (Synergistics, 2012; DMR: 30/5/1/2/2/511MR F/2011/04/14/002). The application for the mine was authorised in 2013.

The following authorisations are in place for the Colliery:

1. Environmental authorisation from the MDEDET in terms of the NEMA and the Environmental Impact Assessment Regulations, 2010 (Government Notice 543 to 546, 18 June 2010) on 11 December 2012 with reference number: 17/2/3N-41, for certain listed activities to be undertaken on the farms Honingkrantz 536 JR, Hartbeestfontein 5637 JR, Eenzaamheid 534 JR and Roodepoortjie 326 JR in the Nkangala District, Mpumalanga Province;
2. Approved EMPr, in terms of the MPRDA, by the DMRE;
3. Approved waste management licence, in terms of the NEMWA, by the National Department of Environmental Affairs and/or MDEDET (Licence No. 12/9/11/L952/6);
4. Approved WUL's, in terms of the National Water Act (No. 36 of 1998), by the DWS:
   - WUL: 04/B20G/ACFGIJ/2538, File: 16/2/7/B200/C528 dated 11 January 2015 (Integrated WUL);
   - WUL: 04/B20G/CI/2246, File: 16/2/7/B200/C528 dated 22 August 2014 (R545 Provincial Road Realignment); and
   - WUL: 04/B20F/ACFGI/2310, File: 16/2/7/B200/K524 dated 22 September 2013 (Phola – Kusile Conveyor).

New Largo acquired the New Largo Coal Mine project from Anglo in August 2018. The mining tenement areas comprising New Largo are 100% owned by New Largo, a consortium owned by Seriti Resource Holdings (Pty) Ltd (Seriti) (45%), IDC (Industrial Development Corporation) (22.5%), and Coalzar Pty Ltd (22.5%), with the balance owned by an employee and community trust.

Since acquiring the reserve, New Largo has re-evaluated how to initiate the mining and some changes in both infrastructure and mine scheduling have occurred. These changes largely reflect matters of timing, size of the mining fleet and orientation of mining cuts; with a key change in timing relating to the planned commencement of mining. New Largo intends to develop the New Largo mining right into a large scale, long life coal mine to supply the baseload coal to the Kusile Power Station and other adjacent Eskom power stations.

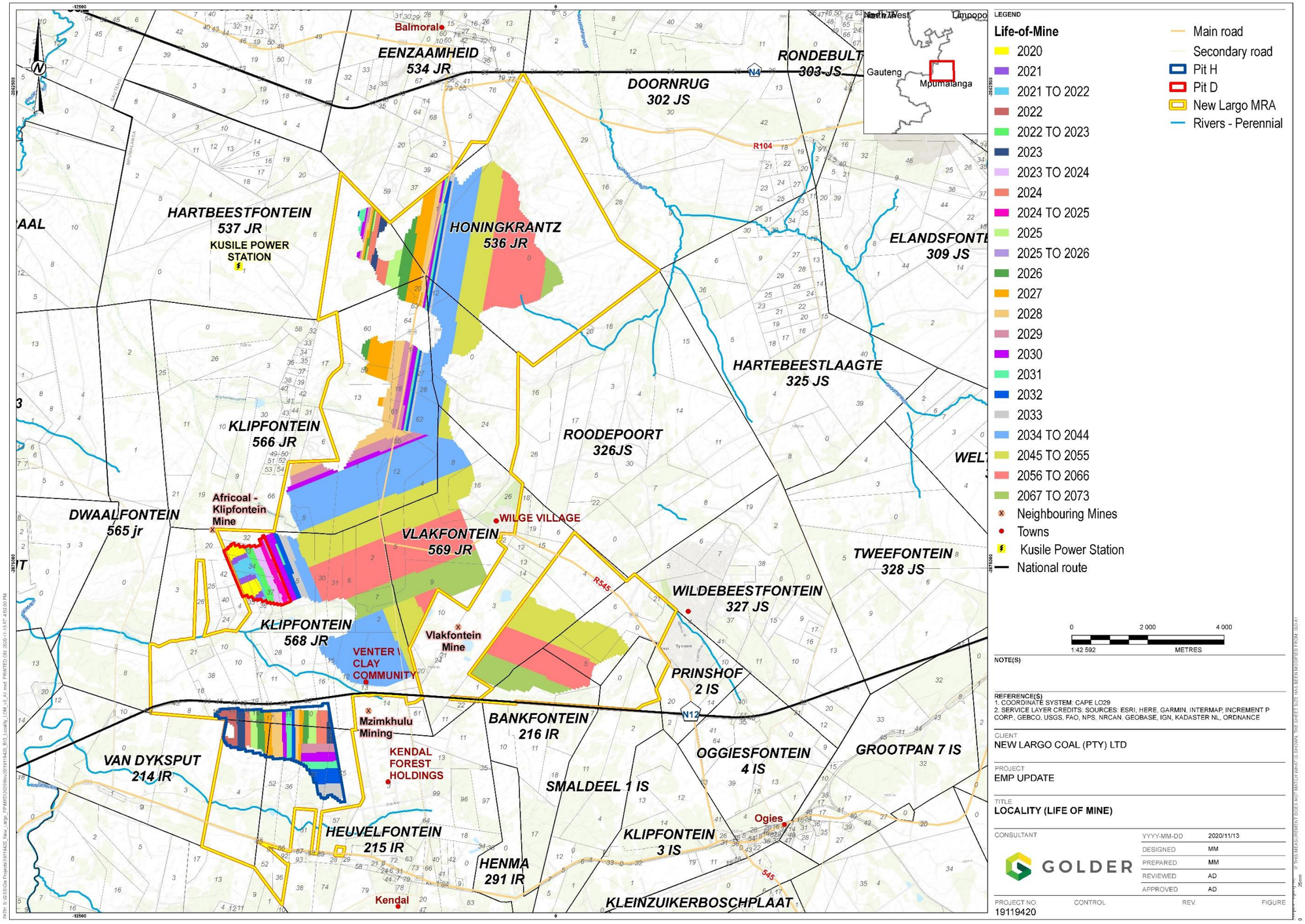

Figure 1: Project Locality, Life of Mine

3.1.1 Description of the Affected Properties

The property information related to New Largo is illustrated in Table 2. The main New Largo Coal Mine falls on Farms Honingkrantz, Hartbeesfontein, Eenzaamheid and Roodepoortjie. Pits D and H are associated with portions on Farms Klipfontein and Heuvelfontein. The farm portions are listed in Appendix B and illustrated in Figure 2, with the property owners presented in Figure 3.

Table 2: Property information

Farm Name	Honingkrantz Haartbeesfontein Eenzaamheid Roodepoortjie Klipfontein Heuvelfontein
Application area (ha)	12 136.53 ha
Magisterial district	eMalahleni
Distance and direction from nearest town	Oogies: approx, 4.5 km away in the South East Direction
21-digit Surveyor General Code for each farm portion	See Appendix B

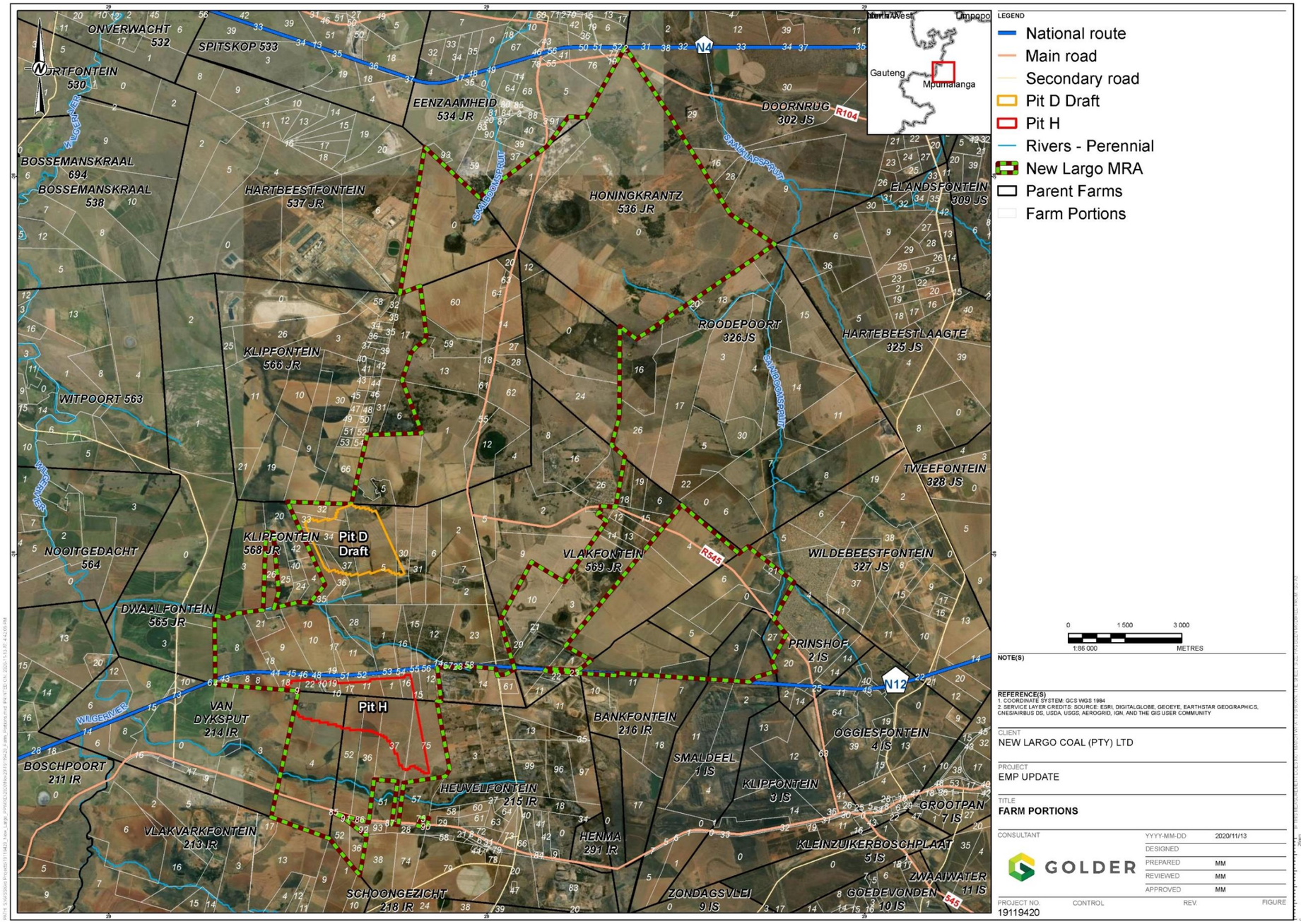

Figure 2: Farm portions associated with New Largo Coal

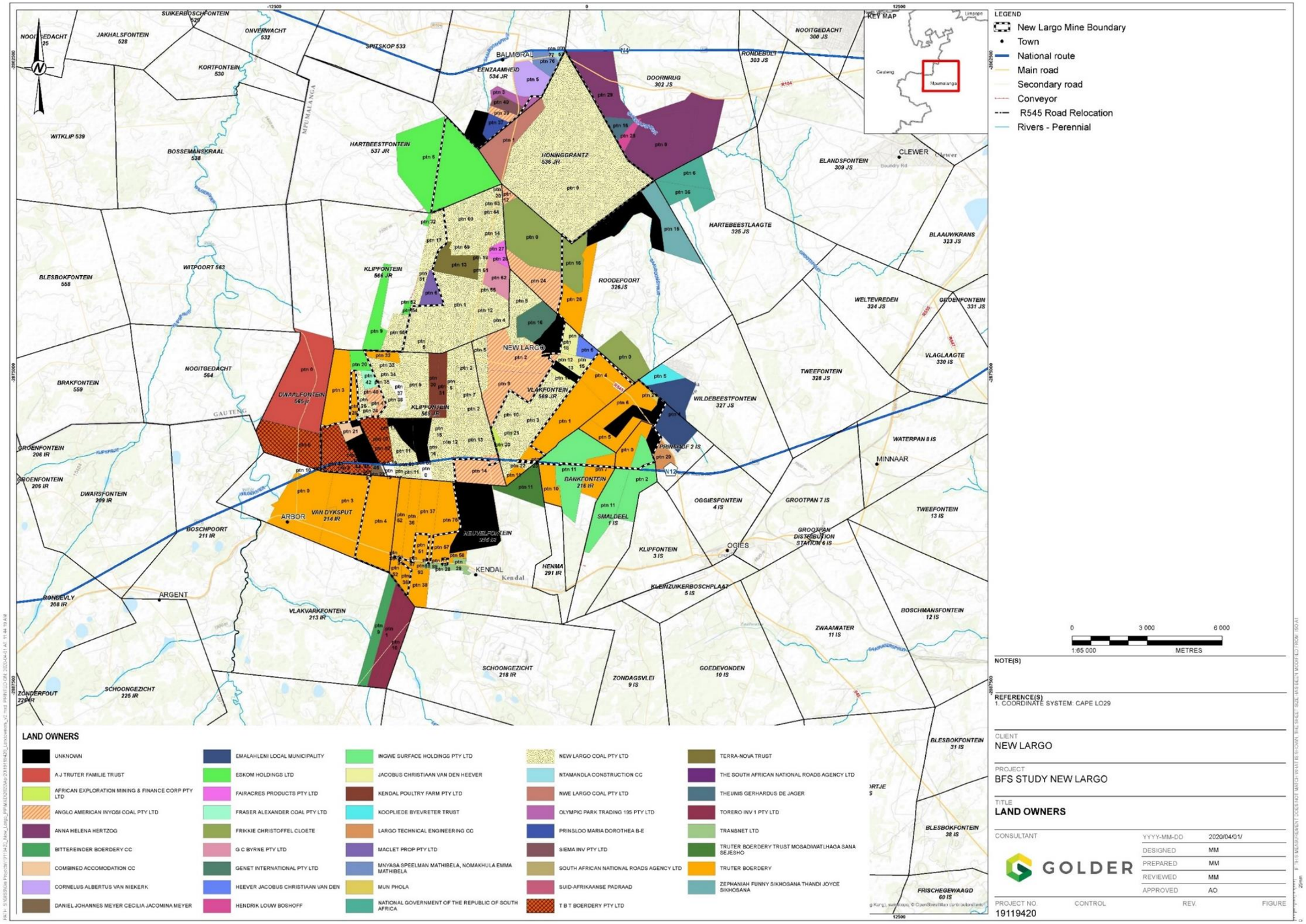

Figure 3: Property owners associated with the project area

3.2 Activity life description

- The amendment to the mine schedule and development of additional infrastructure will enable New Largo to access higher grade coal reserves at an earlier stage of the Life-of-Mine (LoM) than envisaged in the original mine plan. This is essential as coal currently provides for most of South Africa's primary energy needs. The target destinations are expected to be Eskom (Kendal and Kusile Power Station) and other power producers within South Africa. The mine will potentially contribute to the reduction of the domestic shortfall of coal, helping Eskom to ensure a sustainable supply of power, which the South African economy depends on.
- The development of the New Largo mine will occur in phases. The Project is currently at the start of the implementation phase, and mining activity has commenced at Pit D. The principal activities and infrastructure to be implemented during each phase are summarised as follows:
- 2020: Commence truck-and-shovel mining at Pit D,
- 2021 – Commence with construction of the Phase 0 infrastructure (interim coal truck offloading facility) _;
- 2022: Commence truck-and-shovel mining at Pit H:
  - There will be a transitional period during which the mine progresses from the initial box-cut, pre-strip, and ramp up, through to full production.
- 2025: Commence mining at the main New Largo mine:
  - New Largo prefers to develop the main ore body in 2 phases as mentioned below:
    - Mining Phase 1 (2025-2028): Mining Phase 1 will mainly consist of the first box-cut and dragline operation and will include the start of construction of most of the infrastructure. All Phase 1 infrastructure will be implemented by the end of Year 5 (i.e. 2028); and
    - Mining Phase 2 (2032-2039): will be implemented by end of Year 8. It will entail the development of a coal processing plant, the construction of haul roads, permanent Water Treatment Plant, Run-of-Mine (ROM) stockpiles and the introduction of Dragline 2.

The operational life of the main New Largo mine is estimated to be 50 years.

3.3 Overall Project Description

An overview of the project description contained in the 2012 New Largo EIA (Synergistics, 2012) has been updated and summarised below.

3.3.1 Mining Activities

The presence of the old underground workings posed limitations on the mining methods chosen as well as on mine scheduling / sequencing to achieve safe mining conditions as well as the coal qualities required for Kusile. The use of opencast mining using draglines, supported by small truck and shovel operations were selected as the most appropriate approach to mining the resource.

Truck and Shovel will be used as the sole extraction method for Pit D, Pit H and the first two years of production at the main pit. Throughout the operation, it will also be used to some extent at Pits G, C, and E. Three dragline excavators will be introduced over the LoM as the primary mining method. Each will enable an approximately 4Mtpa ramp-up in saleable coal production, allowing phased development and delayed capital expenditure. Single- and double-bench excavations will be used to expose the two target seams. During dragline operations, throw-blasting and bulldozing of spoil is planned to reduce handling of the overburden as much as possible.

Simulations were undertaken using RPM Global Xpac to provide detailed timeseries of box-cut construction and mining operations. These were used as the basis for estimating fleet equipment requirements and associated operating hours, maintenance and replacement schedules, human resource requirements (number and level), and usage of consumables (diesel, electricity, explosives, and lubricants).

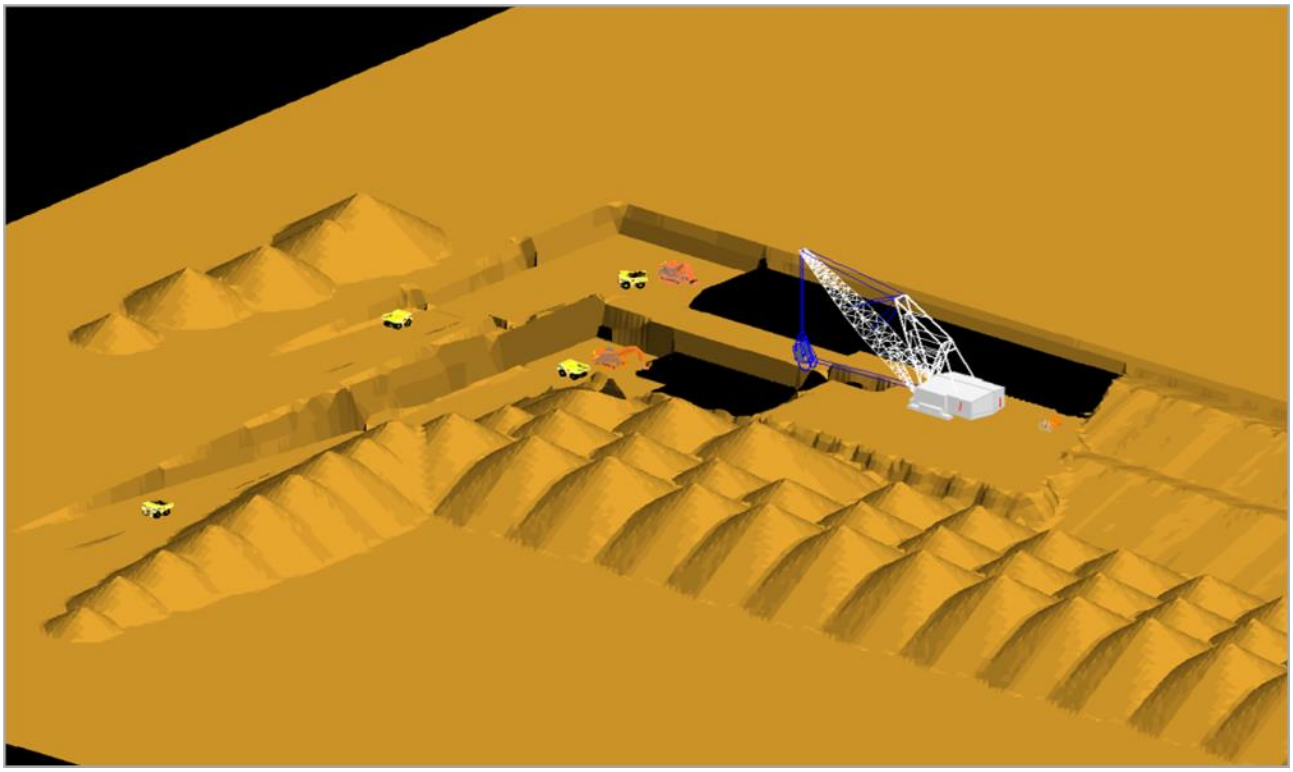

Figure 4: Isometric view of perpendicular coal access ramps - Double seam

3.3.2 Coal Processing

A coal processing plant will be required when mining proceeds to the southern areas where poorer quality coal is located. Higher quality coal (from the northern areas) will have to be blended with lower quality coal to ensure a constant supply, at the correct coal specifications, to Eskom.

The New Largo main mine will produce a total Run of Mine (RoM) of 567Mt over its 50-year LoM, resulting in 490Mt of saleable coal. The separate Pit D mini pit operation will produce approximately 3Mtpa saleable coal over a five-year period totalling 14Mt, while the separate Pit H mini pit operation will produce approximately 3Mtpa of saleable coal over a ten-year period totalling 27Mt. Production at the main pit is scheduled to commence two years into production after the mini pit operations - ramping up as they ramp down.

The mine is scheduled to have a peak RoM of approximately 14.7Mtpa, while peak saleable coal production of approximately 12.0Mtpa.

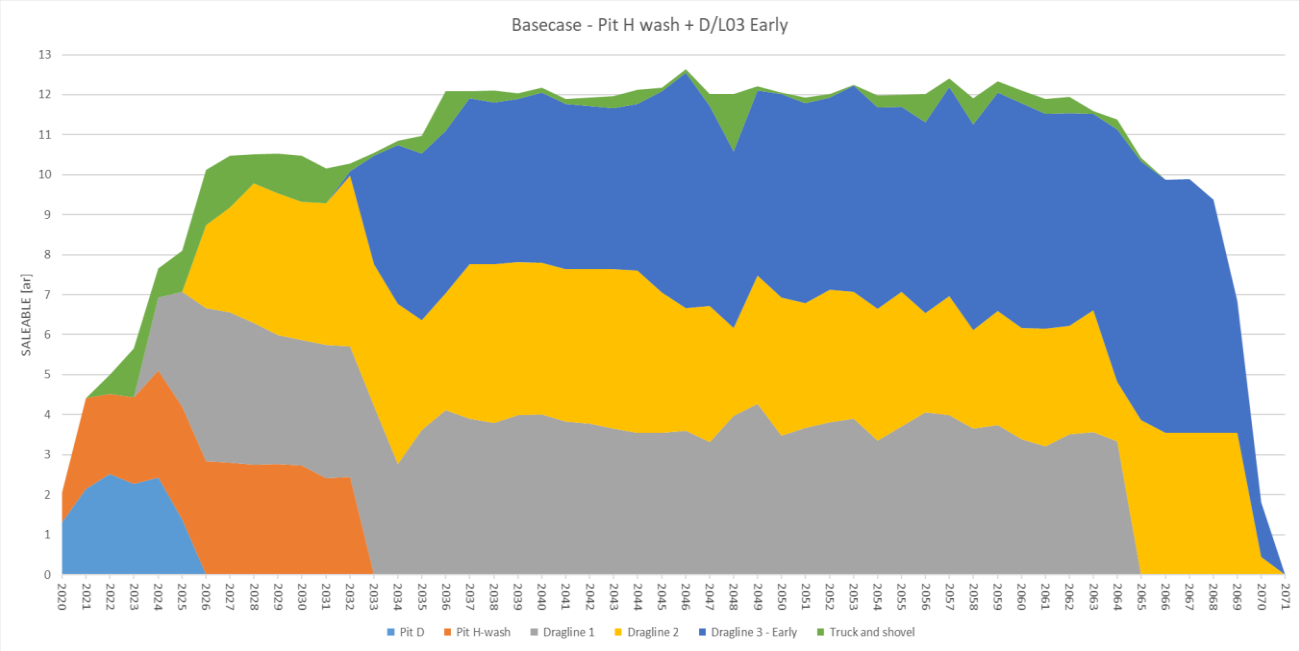

Figure 5: As Received Production from New Largo mines, with main pit split by excavation type

Pit D

All ROM coal mined at Pit D will be processed through an existing Air Plant (FX plant) located at Klipfontein. Product/Saleable Coal will be stockpiled on existing facilities at Klipfontein.

Pit H

All ROM coal mined at Pit H will be crushed with in -pit crushers initially. At a later stage this ROM will be processed through a de-stoning plant which will be constructed within the Pit H footprint.

Main Mine

During Phase 1 of the main mine operation, coal will be delivered at one RoM tip, where it will undergo primary crushing and stockpiling via a windrow stacker. Raw coal fines passing a -50mm primary screen will be sent directly to product, while oversize coal will be sent to the -50mm tertiary crusher.

During Phase 2 of the main mine a second RoM tip will be introduced with a second stacker and switchover facilities allowing the stackers to be fed by either tip. Tip 2 will feed a screening and beneficiation plant, where out-of-specification coal will be washed using dense medium separators in a magnetite medium. Raw coal sent for washing will be crushed to -250mm and passed through a -15mm tertiary screen, of which the approximately 60% oversize will be washed and the approximately 40% undersize will bypass the wash plant. The heavy fraction from washing will be discarded and the light, washed coal fraction will be sent to the tertiary -50mm crusher.

Later in the New Largo LoM an expanded wash plant will allow both tips to feed the wash plant.

The coal stockyard will consist of 6 x 60,000t capacity beds arranged in 3 parallel rows with an additional 2 x 60,000t capacity emergency stockpile. A 23km conveyor will transport the coal to Kusile.

As Kusile does not have a product stockpile, it is important that the supplied feed meets the minimum coal quality specification, to avoid disrupting operations (Table 3). New Largo will manage this through selective mining, monitoring, blending, and beneficiation of approximately 30% of the raw coal. This requirement will increase over the LoM as the average quality of the produced coal decreases.

Table 3: Kusile Coal Quality Specification

Coal Quality (Air Dried Basis)			2012 Coal Specifications	2017 Coal Specifications	2019 Coal Specifications
	Unit	**Design**			
CV	MJ/kg	18.8	**> 16.7**	**> 18.1**	**> 18.8**
Ash	%	35.8	**< 38.0**	**< 36.0**	**< 34.0**
Volatiles	%	18.4	**> 16.5**	**> 18.5**	**> 18.5**
Total moisture as received	%	7.0	**< 10.0**	**< 8.0**	**< 8.0**
Sulphur	%	1.3	**< 1.8**	**< 1.3**	**< 1.3**

Figure 6 shows the Resource blocks requiring selective mining and beneficiation, which are mostly located in the south of the mining right area. Green, purple & blue blocks represent out-of-specification material:

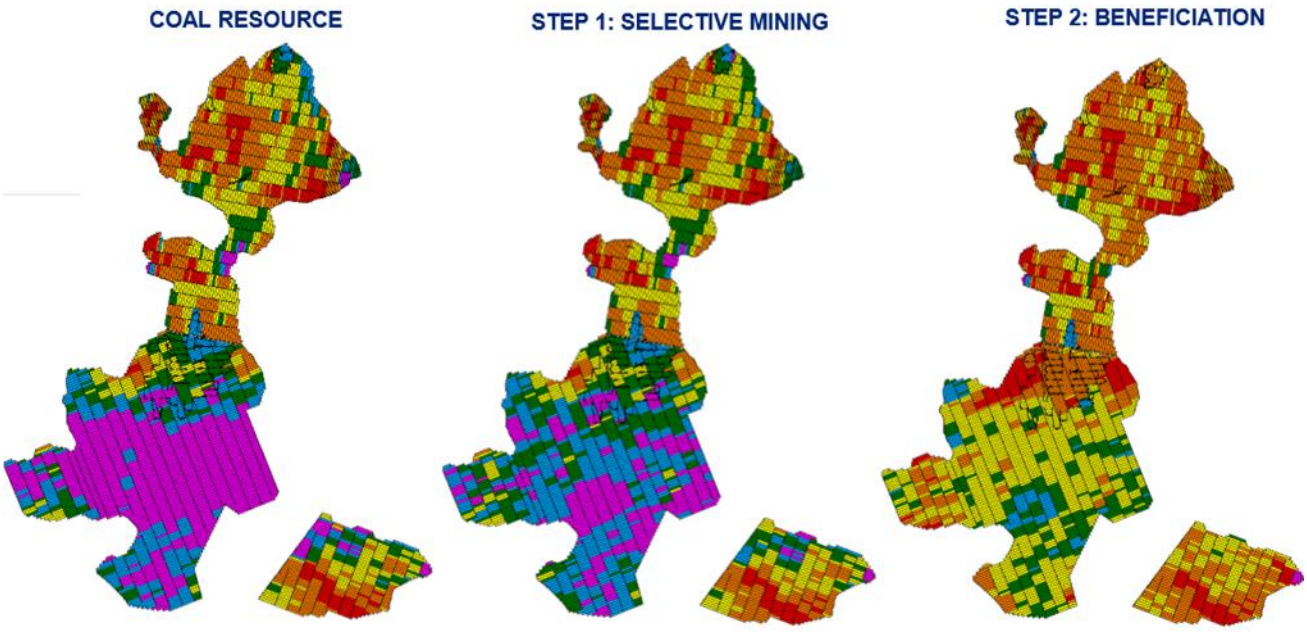

Figure 6: Coal Resource with green, purple & blue blocks representing out-of-specification material

3.3.3 Coal Discards Dump Facility

The discard dump facility for the main mine will be implemented in Phase 1 of the New largo project. In the initial stages no discard dump facility has been allowed for as no discards will be generated.

The fundamental coal discards disposal philosophy for the New Largo Colliery is that coal discards generated from the proposed washing plant will be disposed back into the open mining pit void wherever possible. Within the mine planning, areas of the mined open pit lower than the post-mining groundwater re-charge/decant elevation have been identified as suitable for discards disposal. The available air space volume within these

zones has been determined and is sufficient to accommodate the predicted coarse discards volumes. The proposed strategy for the in-pit discards disposal operation is that coarse coal discards emanating from the washing plant will be conveyed and discharged into an associated 1000 tonne silo adjacent to the plant. Haul trucks from the mining operation, after depositing at the ROM tip, will report to the discards silo to be loaded with discards for the return trip. It is anticipated that only a portion of the trucks will be required to transport discards. Within the identified discards disposal sections of the open pit, the haul trucks will tip the coal discards and the heaps will then be spread into a 500mm thick layer (combination of dozer/grader operation) and compacted via four passes of a ten-tonne vibro roller or similar.

It is likely in practice however, that there will be instances when it will not be possible to transport and/or deposit the discards back to the pit (instances of poor visibility, weather conditions, flooding, no access, no deposition area available etc.). To cater for these a surface discards disposal facility has been provided. The facility has been designed to cater for 10Mt of coal discards, equivalent to 6.25Mm3 based on a placed density of 1.6t per m3. The geometry of the facility has been conservatively based on a maximum height of 25 metres above the surrounding ground level and with side slopes of 1v:8h or just over 7 degrees. The flat side slopes will facilitate ease of placement of soil, vegetation establishment and growth and ongoing maintenance which can be carried out safely with agricultural equipment. The flat side slopes and low overall height will also improve any visual impact whilst also providing flexibility to accommodate any increase in the quantity of discards to be disposed on the facility. Based on the foregoing parameters a footprint area of 700m x 700m is required or approximately 50 hectares.

A suitable site for the surface facility has been identified on the mini pit mining area. Once the mini pit area has been mined and backfilled, the area identified for the discard's facility will be prepared and infrastructure constructed according to a programme based on the anticipated start date of the washing plant. The detailed phasing of construction will be done during the detailed engineering design phase. It must be noted that when backfilling the mini pit, the footprint area for the surface discards facility will not be rehabilitated (i.e. soil placed and vegetated), soil designated for this area must remain stockpiled off the footprint for use later in the rehabilitation of the discard's facility.

A site selected for the disposal facility will be accessed via a haul road and light vehicle road.

Apart from base preparation (mainly for access by haul trucks and to minimize settlement) there is no provision for lining the base of the facility. Clean water diversions drain/berm and a concrete-lined dirty water collection drain/s have been included around the perimeter of the facility, the construction of these will be phased to suit the dump development.

Clean water is diverted away from the facility to join the general clean water system whilst the dirty water is drained via a silt trap to a 5Ml capacity lined storage facility, polluted water collected here is pumped over to the main pollution control dam.

The facility is relatively small (10Mt capacity) and it has been assumed that it will develop linearly over a period of 20 years. Due to the fall from east to west across the facility (approx. 1:50), the progressive development of the dump will be from the south-west (lowest) corner and growing progressively eastwards.

There may be a requirement for dust control on the facility and haul road and it is anticipated that this will be by the mines dust control system and equipment (i.e. dust a side emulsion). The access haul road and the initial section onto the dump footprint will be as per the haul road construction details.

There will be allowance for in-situ/impact compaction of the first two years footprint area of the dump development, thereafter it will be under working cost.

Coal beneficiation is planned for Pit H by dry processing using a destoning Plant (also called an air plant). The air process technology in the destoning Plant upgrades the feed material over a vibrating screen in conjunction with air from a force fan. No process water is used, and no slurry is produced. Pit H will have its own destoning Plant which will beneficiate the ROM coal from Pit H, in the same way the Pit D ROM coal is to be beneficiated at Klipfontein. The destoning plant reject material generated by the destoning plant at Pit H, will be backfilled to the Pit.

The run of mine (ROM) coal from Pit D will be processed at the De-stoning Plant (air plant) at Klipfontein and the rejects will not return to New Largo.

3.3.4 Water Management

Main Mine

Dewatering of the underground workings is required at least four years ahead of the start of mining at the main mine. A water treatment plant (WTP) will treat the water during Phase 2 and excess treated water will be released to tributaries once approvals are in place. In-pit dewatering will take place during mining using approximately 27 X 150kW in-pit pump units, suitable for handling acidic water, and 2 X 300kW pumps for emergency events. There is to be no in-pit storage of water during mining, with water instead held within a 1,200Ml holding dam on surface and later a 1,000Ml dam planned within the Pit G void.

During Phase 1, a 4Ml per day temporary WTP will be provided at New Largo in close proximity to the future permanent water treatment facility. The collection of mine affected water and borehole water is depicted in Figure 7 (Delta BEC, 2019).

The WTP will have a neutralisation and Reverse Osmosis (RO) process. The neutralisation process will be used to treat the dewatering water and pit water for use as process water at the Coal Handling and Processing Plant (CHPP). The RO plant will treat the mine water to supply the mine's potable water requirements and for the discharge to the environment (Delta BEC, 2019).

The temporary WTP will be operated by a contractor. The use of a temporary WTP will allow the quality and quantity of the feed water to be assessed to establish the design specifications for the permanent WTP.

Bulk water supply from the New Largo underground workings is intercepted at the dewatering point situated on the Farm Klipfontein 566JR. The decant water flows into a 10Ml plus freeboard (50m x 50m x 3,5m deep); plastic-lined Decant Raw Water Dam in a 250mm diameter pipeline (refer to Figure 7), in addition to the 1,5Ml of decant water, the underground workings will also be dewatered using three strategically positioned boreholes as recommended by Frank Hodgson in "Report Mine-water balance for New Largo Colliery" dated 10 November 2011. The borehole pumps will pump water from the underground workings to the Decant Raw Water Dam in 250mm diameter pipelines. These pipelines have been positioned to avoid mining where reasonably possible.

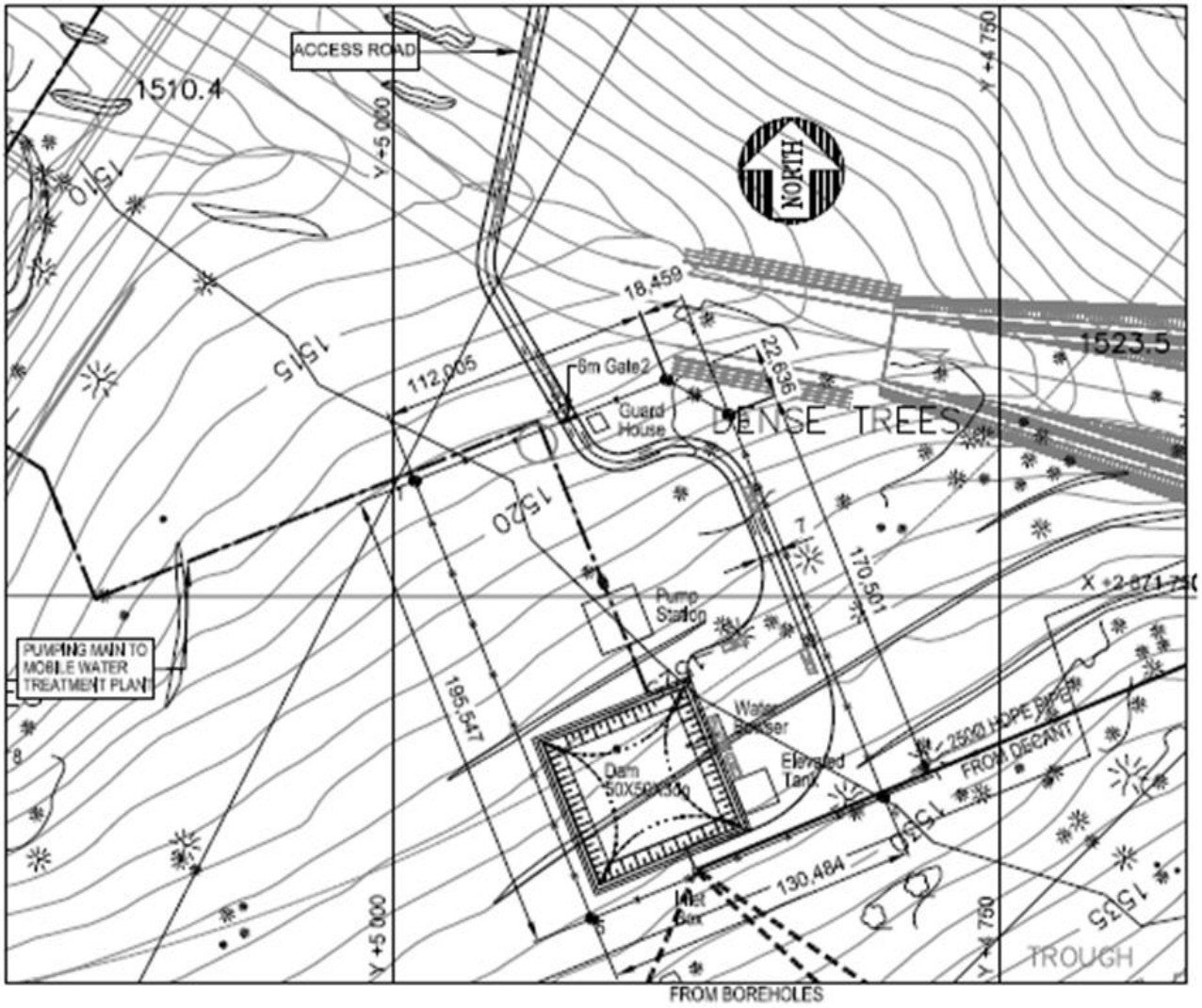

Figure 7: Decant Point General Arrangement

A pump station situated at the Decant Water Dam pumps water at a rate of 400m³ per hour to the mobile WTP located at New Largo where water is then treated at a rate of up to 4Ml per day. Considering the Life of Mine, the WTP is capable of treating water at this rate between the period of Year 1 to Year 5 thereafter a permanent WTP will be implemented.

The water will be treated to potable standards and will be stored in a 1Ml Potable Water Reservoir from where the water is pumped by means of a 22kW pump to a 250kl Elevated Tank positioned at New Largo. From the Elevated Tank, water is supplied to the Fire Water reservoirs and the New Largo infrastructure.

A pump station supplied from the Elevated tank delivers bulk water along the overland conveyor.

Surplus water produced (approximately 2.5Ml per day) by the WTP will be discharged into the natural watercourses (Delta BEC, 2019) in terms of a water use authorisation.

Waste handling facilities have been provided in close proximity to the WTP for the gypsum and brine generated from the treatment process in the form of a 100m x 100m bunded concrete slab and a 5Ml plastic-lined dam respectively as shown in Figure 7. There are two alternatives available for the disposing of gypsum; the first is to use the gypsum as part of the backfill in the pit and the second is for the appointed Water Treatment Plant

Contractor to dispose it in a licensed off-site waste handling facility or find a suitable off-take. It is important to note that the contract with the WTP contractor will be structured to include for this activity.

Water for construction purposes will be sourced from the 10Ml Decant Raw Water Dam. Water tankers will be filled by means of an overhead tank which is supplied using a submersible pump located in the dam and the system is manually controlled by the tanker driver.

Pit H

Specifically, in relation to Pit H there are no components of infrastructure indicated in relation to water management infrastructure (pipes, sumps and pumps, pollution management infrastructure) although there is one borehole licensed in proximity to Pit H and a licensed water discharge point to the South of the Pit.

Pit D

This pit will be mined through from the neighbouring Africoal pit, whose existing infrastructure will be used to support mining. No water management infrastructure is required at this location.

3.3.4.1 Sewage Reticulation and Treatment Plant for Phase 1

Main mine

During construction and for the duration of Phase 1, a small “Lilliput” sewage treatment plant, model SBC6000 FK capable of treating sewage of 50 to 75 persons at 90 litres per person per day, will be installed at the permanent sewage treatment site. The treatment plant comprises a pre-digestion tank, a balancing tank, an aeration tank and a chlorinator to chlorinate the effluent.

Treated effluent will gravitate to the pollution dam sited below the treatment plant. The dried sludge produced from the process will be transported by the operating contractor to licensed disposal sites.

Sewage from the Plant office and the Project office will gravitate in a buried 110mm diameter, uPVC sewer pipeline to the “Lilliput” sewage treatment plant. Manholes will be provided along its total length and at all changes in direction.

The contractors will construct a conservancy tank to be serviced by a tanker (‘honey sucker’) and the sewage will be disposed off-site at a suitable sewage treatment plant. Contractors’ will also, in the event of the sewage not reporting to the conservancy tank provide their own toilet disposal arrangement for their staff and workers during the construction period in the form of porta-loos or a similar approved facility along the conveyor.

Pit H

During the first phase of mining, it is assumed that the sewage demand will be quite small and thus only a hired portable sewage system will be required (by making use of a Honeysucker system). During Phase 2, the sewage demand will have increased due to the increase in mining operations and increase of workers on site, hence the proposed sewage system will be installed. The sewer network of the mine is summarised as follows:

- Sewage will enter the system from the connections that will be provided at all relevant infrastructure;
- Sewer connections from the structures will discharge into manholes situated close to the structures;
- From these manholes, the sewage will enter the main sewer network;
- All sewage will flow to the conservancy tank.

Pit D

This pit will be mined through from the neighbouring Africoal pit, whose existing infrastructure will be used to support mining. No additional sewage treatment infrastructure is required at this location

3.3.5 Pollution Control Dams

Main mine

Storm and wash down water from within the workshop complex, tip area, crusher area, stockpile area, haul roads, ramps and discard dump are considered to be dirty. This water will be collected in a series of concrete-lined drains that will flow into, either, the Admin area polluted water dam, the Plant area polluted water dam or the Tip 2 transfer dam. Water from the pit will be pumped into the Ramp Transfer Dams which in turn will gravity feed or pump into the stilling chambers located close to the outfall drain just above the 5 storage dams.

Upstream of each dam is a silt trap and oil traps are provided at all the workshops and wash bays.

The polluted water dams typically provide surge capacity for a 1:50 year storm plus 800mm freeboard. The water levels in these pollution dams are to be maintained empty, so as to ensure the surge capacity is available should a large rainfall event occur.

The project technical risk assessment has shown that the Administration Dam should be sized to accommodate the 1:250-year storm event due to its closeness to the pit.

The dams are lined with a 2mm thick HDPE liner and all inlet, overflow and outlet structures will be reinforced concrete. The 5 Storage dams together with the Balancing Dam are designed to retain all the water from the pollution dams, runoff from the polluted areas, pit dewatering and all surplus dirty water.

As the capacity of the dam exceeds 50Ml and/or wall heights exceed 5m, the design of the dam requires the appointment of an Approved Professional registered dam engineer. This dam will also have to be registered with the Dam Safety Officer of the Department of Water and Sanitation.

Dirty/Polluted water dams should be maintained empty at all times to ensure that storage capacity is always available to accommodate excessive storm events.

Pit H

PCD 1 receives inflow from direct rainfall and runoff from the plant area. Outflows from this PCD are evaporation, dust suppression and spillage. The capacity of the PCD1 is 45 000 m3. The operational rule for dust suppression at the dam is that the water can be extracted at any time. This was done to ensure that the PCD remains as empty as possible.

PCD 2 water is pumped from the in-pit sump (30 000 m3), there is no catchment directly contributing to this PCD. The Outflows from this PCD are evaporation, dust suppression and spillage. The capacity of the PCD is 59 533 m3. The operational rule for pumping from the in-pit sump is when the PCD 2 has capacity greater than 10% and stops when the PCD capacity is greater than 95% i.e. maximising the PCD storage capacity. The pumping will stop when the PCD is full, this is likely to occur most wet seasons. It is therefore important to ensure that the PCD water level is kept as low as possible to ensure that there is capacity available during the wet season, this will ensure the pit working are not impeded by flooding. The operational rule for dust suppression at the dam is that the water can be extracted if the PCD capacity is greater than 20 %. This was done to ensure that the PCD remains as empty as possible

Pit D

This pit will be mined through from the neighbouring Africoal pit, whose existing infrastructure will be used to support mining. No additional PCD infrastructure is proposed at this location.

3.3.6 Silt Management

Main Mine and Pit H

The silt management philosophy is primarily that de-silting takes place at source, thus silt traps have been provided at bunded areas at conveyor transfers. Similarly, stockpile areas will be provided with large bed silt traps at the end of each stockpile to ensure adequate silt storage volume and reasonable settling time is provided. A final large bed silt trap will be provided at the end of a pollution drain system, before the pollution control dam, to minimise silting of the dam.

These final silt traps are sized to suit the flow expected from drain system and the available cleaning equipment. All stockpile and final silt traps are provided with two separate and isolatable beds that enable drying and de-silting by mechanised means. Silt drying beds will be designed to suit the available machinery for the plant area, typically a bobcat or a front-end loader with 3m to 4m wide bucket.

Silt traps that are not conveniently situated near to coal stockpiles, such as those along overland belts, will be provided with drying beds, for placement of removed saturated silt to enable drying to desired moisture content. All silt traps will also be provided with an overflow/bypass channel to operate under severe rain events.

Pit D

This pit will be mined through from the neighbouring Africoal pit, whose existing infrastructure will be used to support mining. No additional silt management infrastructure is proposed at this location.

3.3.7 Waste Streams

Based upon the current understanding of the New Largo operation, a number of waste streams will be generated, which will be managed in the following groups:

3.3.7.1 Domestic Waste

- General household waste (incl. plastic);
- Cans (aluminium);
- Paper;
- Glass;
- Organic waste;
  - Leaves, grass cuttings, branches/tree cuttings;
  - Wood products; and
  - Perishable produce.
- Salvageable items;
  - Salvageable steel;
  - Tyres; and
  - Other, including wood, plastic, pipes, cables, bricks, paint tins and rubber.

3.3.7.2 Hazardous Waste

- Hydrocarbons (e.g. used oil, diesel spillage);
- Batteries;

- Rubber;
- Contaminated PPE;
- Empty grease drums;
- Empty chemical containers (plastic and glass);
- Fluorescent tubes;
- Oil-contaminated soil, paper, plastic, rags;
- Empty oil drums;
- E-Waste;
  - Appliances;
  - Printers, copiers and scanners;
  - Cables;
  - Computers, monitors, keyboards, mouse; and
  - Miscellaneous (CDs, punch cards, etc.).

3.3.7.3 Mine Waste

- Waste rock;
- Oil/steel contaminated ore;
- Contaminated (chemical/ hydrocarbon) spillage; and
- Coal discard material.

3.3.7.4 Other Waste

- Building rubble; and
- Sewage sludge and screenings from the sewage works.

3.3.8 Electrical Infrastructure

3.3.8.1 Bulk Power Supply

The bulk electrical supply will be derived from two sources. The initial stages will be supplied from an 8 MVA temporary supply. The mining operations will be enabled by a 40 MVA, standard power supply that will be upgraded to premium power in future.

3.3.8.2 Eskom 8 MVA Temporary Power Supply

An 8 MVA temporary power supply was made available to New Largo in 2012. The point of supply was installed but never used, resulting in vandalism and theft. Eskom has agreed to provide a budget quotation for the remedial work and to review the initial power allocation.

The 8 MVA, 22 kV temporary power supply will be sufficient to provide power to the mine until the first dragline starts production in 2022. The temporary power will be used to supply the Eskom feed conveyor, FX plant and dragline erection site via suitably rated minisubs.

3.3.8.3 Eskom 132 kV Premium Power Supply

Eskom have been requested to provide a bulk power supply at 132kV to the mine. It is proposed that the standard portion of the power supply be derived from Bravo substation at Kusile while the premium power

portion will be derived from Khutala substation. The supply substations will be confirmed by Eskom. The power supply to the mine should be commissioned by December 2021 with the premium portion being commissioned by December 2027.

The power supply to the mine will be metered at 132kV, with the Eskom substation and the Mine's consumer substation being constructed on a common terrace. The substation will consist of a 132kV busbar to power two 40 MVA 132/22 kV transformers with a further two 132kV feeder bays to supply power to the North and South open pits.

The Eskom scope of work for the standard portion of the power supply is to:

- Construct a 132kV busbar at Bravo substation Kusile.
- Construct a 6km 132kV line from Bravo to New Largo substation. (Existing 400kV structures will be restrung).
- Construct a 132kV bulk power supply point at New Largo.

The Eskom scope of work for the premium portion of the power supply is to:

- Extend the 132kV busbar at Khutala and construct a 132kV feeder bay.
- Construct a 132kV overhead line from Khutala to New Largo substation.
- Equip a 132kV feeder bay at New Largo substation.

All above mentioned infrastructure can only be confirmed after Eskom has processed the application and provided a budget estimate for the supply.

3.3.9 Activity Infrastructure

The infrastructure associated with New Largo will be phased to accommodate the mining operations. The following infrastructure may be implemented during Phase 1.

- Conveyors (CVY 604, -606, -610. -613, -614)
- Tip 1 (North Tip)
- Haul Road (Pit A to Tip 1)
- Conveyor (Tip to ROM Stockpile)
- ROM Stockpile 1
- FTP Silo 1
- Tertiary Crusher Bin
- Sub-station 14
- Assizing Bin
- Distribution Bin
- 10kt Silo
- Ramps (G1, G2, A2 – A4)
- Dragline 1
- Temporary WTP
- Access Roads and Parking Areas
- Security Building
- Explosive Magazine Facility
- Pollution Control Dams (PCDs)
- Mine Offices
- Change House
- Mine Stores
- Store Yard
- Earth Moving Vehicle (EMV) Workshops
- Pit Offices
- Tyre Store / Repair Area
- Sewage Treatment Plant

- Dragline 2
- Haul Road (From Ramp A4 to the Pit C)
- Dragline Assembly Yard and Dragline Road to Pit A
- Overburden Road
- R545 Road Diversion
- Light Duty Vehicle (LDV) / Field Services Workshop
- Flammable Store
- Gas Store
- LDV Fuel Bay
- Contractors Laydown Area
- Survey & Geology Parking
- Laboratory
- Plant Offices
- 5 x Single Haul Road Underpasses
- Pit Access Road
- Training Centre
- Security Fence
- Topsoil Stockpile Area (45 Ha)
- Field Service Workshop & Parking
- Core Shed
- Dust Control Silo
- EMV Wash Bay
- Cable Repair Shop
- Clinic
- Hard Stand Area EMV's
- Bulk Oil Storage
- Shift Meeting Room
- Production Foreman's Meeting Room
- Service Bay Workshop
- EMV Office Parking
- Emergency Services / Fire Station
- Canteen
- Community Hall
- EMV Brake Test Ramp
- Stores Loading Area
- Delivery Truck Overspill Parking
- Water Bowser Filling Point
- Silt Trap 3
- LDV Wash Bay
- Salvage Yard and Waste Handling
- LDV Brake Test Ramp
- EMV Workshop Parking Area
- Weigh Bridge
- Product coal off-loading facility
- Access road to Product off-loading facility

It is anticipated that Phase 2 infrastructure will include the following:

- Permanent WTP;
- Haul Road Pit E to South Tip;
- Conveyor (Tip to ROM Stockpile);
- Coal Processing Plant 2 x DMS (Required in Quarter 2, Year 7);
- Tip 2 (South Tip) (Commissioned by Quarter 2, Year 8);
- ROM Stockpile 2 (Will be required when Tip 2 is commissioned);

- FTP Silo 2;
- 2 x Primary Screening;
- 2 x Secondary Screening; and
- Discard Dump (Required when Plant is commissioned).

Phase 3 entails the design of the following key infrastructure;

- Expansion of permanent WTP as required;
- Dragline (Haul Road to Pit E);
- Dragline 3 (Operational by Quarter 4, Year 12);
- Coal Process Plant 1 x DMS; and
- 1 x Secondary Screening Plant.

New Largo is now considering the mining of Pits H and D and Phase 0 in the initial stages. The proposed infrastructure associated with Pit H and D and Phase 0 are indicated below but not limited to the following (Figure 9 to Figure 11):

Pit H:

- Opencast box-cut of Pit H;
- Haul roads;
- ROM stockpile;
- Overburden stockpiles;
- Mobile crusher;
- 2 x Pollution Control Dams;
- Evaporation paddocks; and
- FX Plant (Air-dry processing system, referred to as “de-stoning plant”).

Pit D:

- Opencast box-cut of Pit D;
- Haul roads;
- ROM stockpile; and
- Overburden stockpiles;

Phase 0:

- Workshops, offices, weighbridge areas and stockpile areas.

The mine boundary area (including Pits H and D) in relation to the environmentally sensitive areas is indicated in Figure 12.

3.4 Key Changes from Existing Authorised Project

The following key changes are noted:

- The overland conveyor system will not be constructed until later in the project lifetime. Instead, coal will be trucked from Pits D and H (Figure 8):
  - Pit D = 220 000 Tonne (T) per month at 25 working days per month = 275 truck loads per day on 32T coal road trucks; and
  - Pit H = 200 000 T per month at 25 workings days per month = 250 truck loads per day on 32T coal road trucks.
- Phase 0 has been added to the Project which entails the construction of an offloading facility and link to the Kusile Main Feed conveyor adjacent to the MRA boundary with Kusile Power station, as well as the (authorised) northern access road (Figure 9).
- The planned commencement of mining is now through pits Pit D and H.
- Because mining is now starting at Pit H, the following infrastructure is necessary to support mining at this location (Figure 10):
  - haul roads, access roads, product stockpiles, destoning plant, Pollution Control Dam (PCD) with a silt trap for dirty water management.
  - reject material from the destoning plant will be backfilled into Pit H, along with the waste rock and overburden as part of the approved rehabilitation plan.
- The extent of Pit D has been defined. No new infrastructure is required; this pit will be mined through from the neighbouring Africoal pit, whose existing infrastructure will be used to support mining at Pit D (Figure 11).

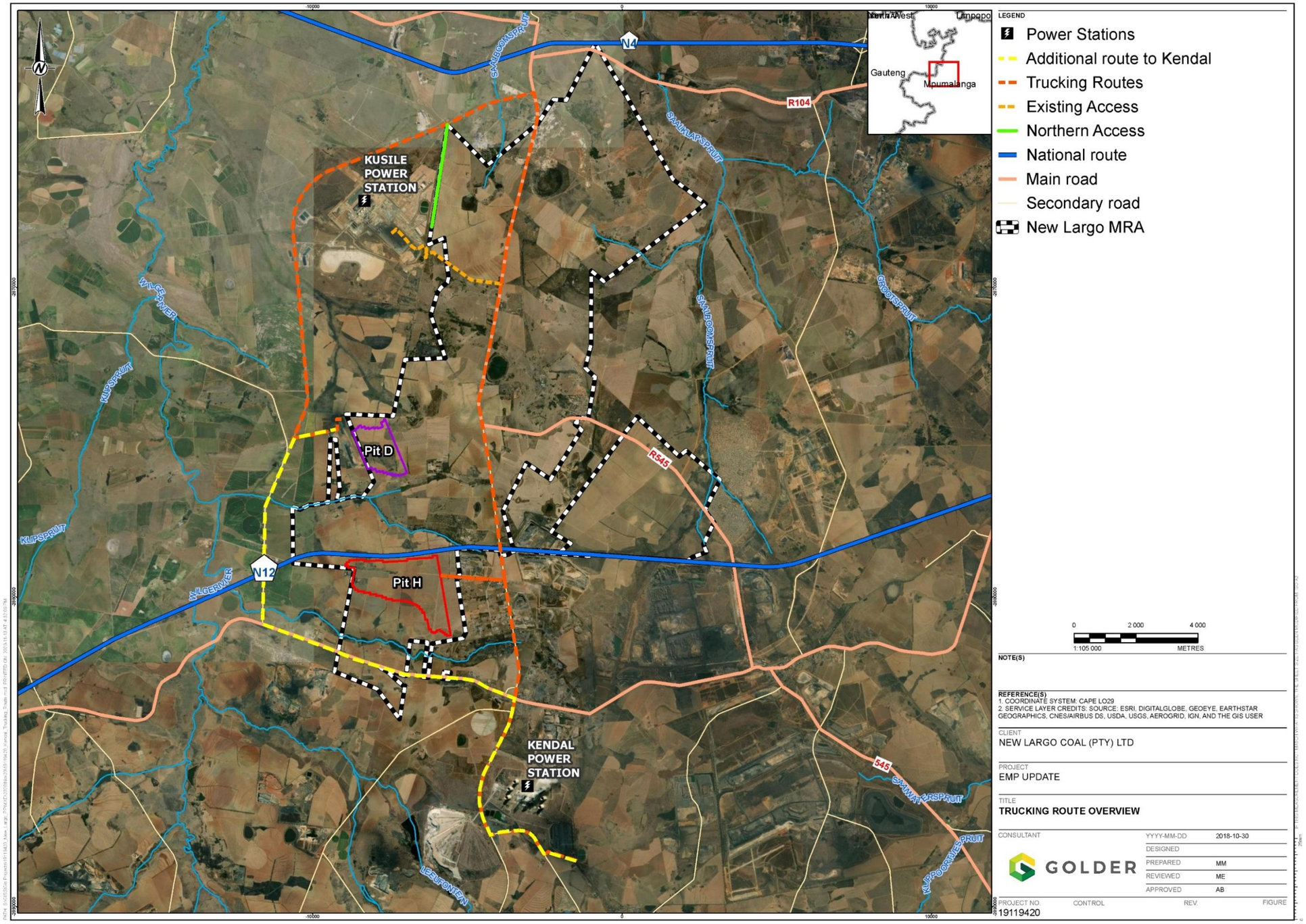

Figure 8: Proposed trucking routes from Pit D and Pit H to Kendal and Kusile Power Stations

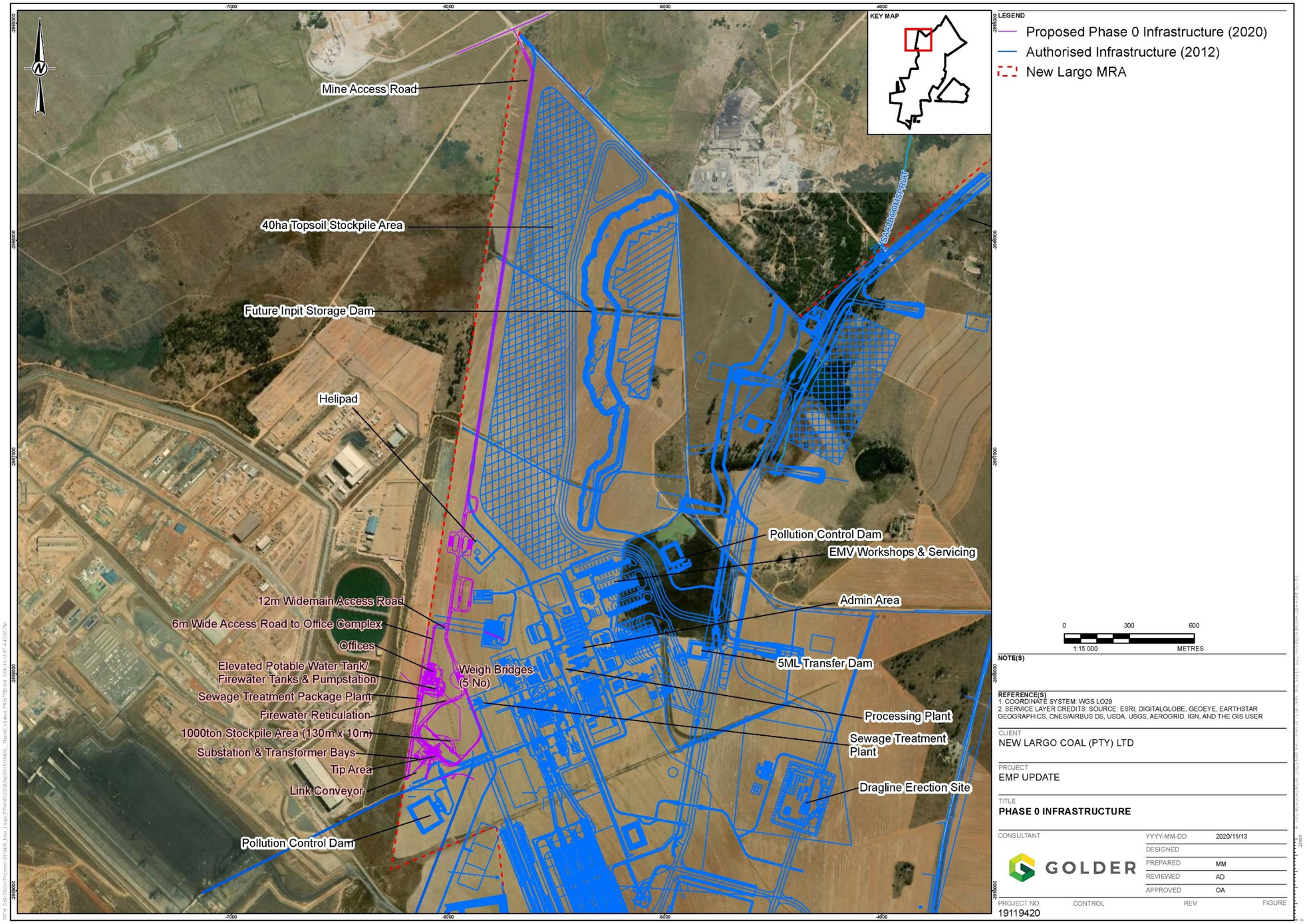

Figure 9: New Phase 0 infrastructure (2020) and authorised infrastructure (2012)

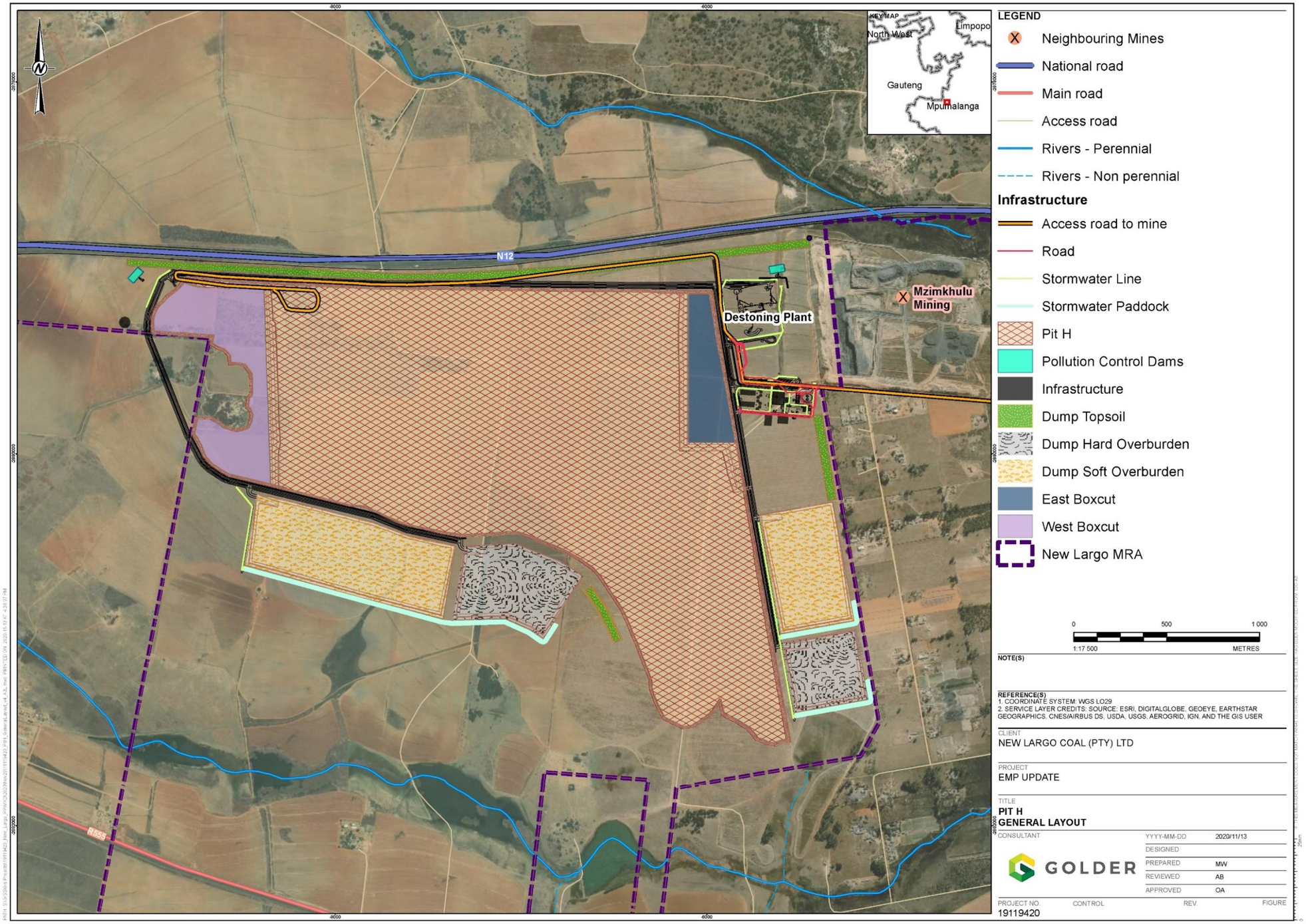

Figure 10: Pit H Layout and Infrastructure

Figure 11: Pit D layout and infrastructure

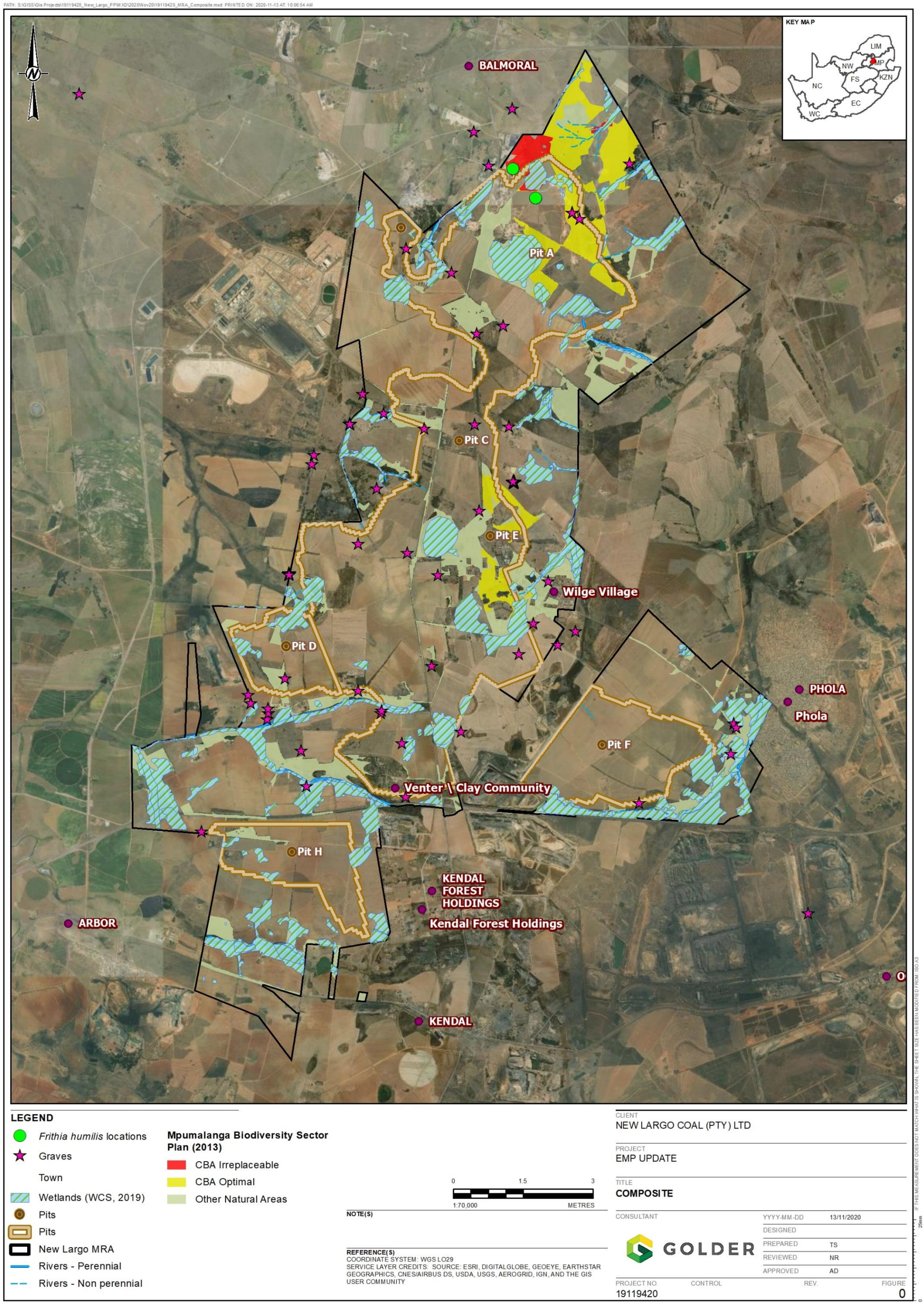

Figure 12: Composite map showing the sensitive areas

3.5 Consideration of Alternatives

The original EIA conducted for New Largo Colliery (Synergistics, 2012) investigated various alternatives to the project, including the “no-go” development option. The results of that investigation indicated that Kusile Power Station is key in achieving National Government’s electricity generation strategy for South Africa. The New Largo coal reserve is located directly to the east of Kusile, ideally situated to meet the Power Station’s demand.

Should the New Largo resource adjacent to Kusile not be developed (no-go development option), coal from elsewhere would be required to supply Kusile Power Station.

Failure to supply adequate coal to Kusile Power Station will result in power shortages in the national grids since there are no short to medium term options to replace Kusile’s energy generation capacity on a national level and that it will have negative impacts on national economic growth and development.

In terms of scale and tonnages required, there is no alternative coal mine, or combination of smaller coal mines that could supply this coal on schedule and at the correct qualities and quantities. New Largo is the best suited coal reserve to supply Kusile.

3.5.1.1 Mining Methods

During the previously-conducted consideration of alternatives exercise, part of which included the identification of appropriate mining methods for the resource, several portions of the New Largo coal reserve where mining by underground methods had taken place in the past were identified. Collapse of old underground workings and spontaneous combustion poses a hazard to both the workforce and equipment if not adequately managed. The presence of the old underground workings posed limitations on the mining methods chosen as well as on mine scheduling / sequencing to achieve safe mining conditions as well as the coal qualities required for Kusile. The use of opencast mining using draglines, supported by small truck and shovel operations was selected as the most appropriate approach to mining the resource. The use of this combination of methods facilitates:

- Extraction of shallow coal seams with a low stripping ratio (tons of overburden/tons of coal), generally too shallow for underground mining;
- Recovery of coal reserves remaining in areas previously mined by underground methods;
- Maximisation of the utilisation of the New Largo coal reserve and thus coal supply to Kusile in order to sustain Kusile for the longest period possible from the New Largo coal reserve; and
- Production of the vast quantities of coal required by Kusile.

Underground mining was not considered as an alternative mining method.

3.5.1.2 Location of Infrastructure

During the consideration of alternatives process (Synergistics, 2012), the identification and selection of locations for the placement of infrastructure was done based on a process that considered access to the reserves, location of sensitive environments, servitudes, areas previously underground mined and visual impact.

The positioning of surface infrastructure such as tips, the coal processing plant, haul roads and conveyors to Kusile, took cognisance of the location of Kusile, location of the mineable coal reserve in relation to Kusile, and the fact that coal needs to be hauled from the mine and conveyed to Kusile. Distances and efficiency were prioritised from an economic and air quality point of view - since the haulage of coal is the single most significant source of dust at an opencast coal mine.

The positioning of infrastructure also took cognisance of existing power lines, pipelines, roads and adjacent mining activities. The majority of the surface infrastructure is located between the New Largo mining area and Kusile.

3.5.1.3 Surface Infrastructure

3.5.1.3.1 Access Roads

The existing gravel Provincial “School Road” off the R545 from the north-east of the mine will be used for access to the construction site and is currently in reasonable condition; however, provision has been made for an additional wearing course and upgrade for drainage. Access to the dragline site will also be from the “School Road” and will be constructed by the dragline contractor as part of their scope of work.

Improved access has also been provided to New Largo’s farm (previously known as Mr A. Van Rooyen’s farm). This farm is to be used as an induction, training facility and a medical centre. A turning circle has been provided at the intersection between the existing farm road and the “School Road”.

At a point on the “School Road” approximately 250m from the intersection of the R545, a construction entrance security complex has been provided.

3.5.1.3.2 Internal Mine Roads

The main arterial inside the mine area starts from the main entrance gate situated north of the mine infrastructure footprint to the end of the store's area on the south. This road is a 7,4m wide surfaced road with kerbs and shoulders. This road widens at the entrance and at the store's area to provide for a vehicle & truck waiting area and a weighing facility, respectively.

The secondary roads within the mine office and workshop complex vary between 6m and 7,4m wide and are surfaced with 30mm pre-mix and constructed to the same specification as the main access road. Mountable kerbs have been provided along all surfaced roads.

Secondary roads have been provided to the Mine Offices, Main Store, Clinic, Emergency Services, Shift Meeting Room, Production Foreman’s Room, Pump Rehab Workshop, Bulk Fuel/Oil Storage, Pit Offices, EMV Office, Tyre Store, LDV Workshop and the LDV Wash-bay on the eastern side off the main arterial. To the western side of the main arterial, secondary roads have been provided to Survey & Geology, Training Centre, future Plant Offices, future Plant Workshop and the future Plant area. Access to the Distribution Bin, the silos and the Stockyard can be achieved off the western secondary roads. Surfaced roads have been provided to and around the Primary and Secondary Screening buildings.

The main arterial leads onto gravel surfaced road that provides access to the Laydown area, the haul road and the haul road maintenance road. Tertiary roads are also provided to Tip 1, Stockpile areas, Explosive magazine and to the Distribution Bin and the overland conveyor. These roads are 6m wide gravel roads.

Side drains have been provided along the roads and, where necessary, concrete-lined drains are provided. All gravel drains will be hydro seeded or grassed for erosion protection.

Stormwater culverts have been provided along the roads where appropriate to ensure stormwater flows from the high side to the low side of the roads.

Light duty 4m wide gravel access/maintenance roads have typically been provided to the sewage treatment plant, the pollution control dams, and the pump stations and along the conveyor routes.

3.5.1.3.3 Maintenance Roads

A 6-metre-wide gravel-surfaced maintenance road runs parallel to the haul road, but does not have direct access to it except at a limited number of locations where controlled access is provided to areas such as the Tip, Pit Ramps and the Dust Suppression Tank.

Five two-way underpass structures (dual 4m wide x 4.2m high) have been provided where the maintenance road crosses under the haul road. Due to the restricted vertical clearance, these underpasses can only be

traversed by light vehicles and certain heavy vehicles. The maintenance road permits maintenance staff to access earthmoving vehicles that have broken down on the haul road and to access the ramp de-watering dams and Discard and Temporary Stockpile areas.

Light duty maintenance roads have been provided for access to facilities which are accessed infrequently, such as storage dams. These roads are four-metre-wide and have reduced pavement layer-works.

3.5.1.3.4 Temporary Access for Construction

During the construction phase, temporary access to the site will be obtained from the existing R545 Provincial Road via the existing gravel Provincial School Road (S234). The temporary mine access will be from the School Road some 250 metres from the existing R545 intersection. In the interest of safety during construction, the temporary construction access to the mine (from the east) is completely separate from the permanent mine access, which will be from the north-west.

A parking area for 200 vehicles is to be provided adjacent to the temporary mine entrance at the Security Complex, but outside the security area. Private vehicles will not be permitted to enter the construction area. Buses will be provided by the contractors to transport personnel within the construction area. Personnel will be accessing the site via pedestrian gates at the security complex and will then walk along covered walkways to the bus shelter, where they will board buses for transport to their on-site workplaces. The reverse procedure will apply when leaving the construction site.

Vehicles delivering new plant and equipment enter a waiting area at the security complex for inspection and clearance, before proceeding onto mine property. A similar waiting area is provided for the inspection of vehicles departing the mine property.

3.5.1.3.5 R545 Re-alignment

The R545 re-alignment is authorised, and no changes or amendments to the proposed re-alignment are being considered as part of this EMPr amendment application. The information on alternatives considered for the authorised R545 alignment is presented below for completeness.

The existing provincial road R545 (also referred to as D686) crosses the proposed mining area. The mining operation will undermine a section of the existing road, which will be closed to traffic.

The R545 provides a north-south link between the N4 in the north and the N12 in the south and provides direct access to these two freeways via access interchanges. Due to the significance of the R545 in the local road network, it will be necessary to retain the R545 by constructing a new section of road to bypass the proposed mining area.

The re-alignment of the R545 forms part of the Stage 2 development of the New Largo Mine. It is anticipated that the construction of this re-alignment will be completed by the start of year 1, which correlates to the time when mining activities will occur near the R545.

An application for Environmental Authorisation of the road re-alignment has been submitted to the DMRE (MP 30/5/1/2/3/2/1 (10026) EM) and a Water Use Licence Application submitted to the DWS.

Various alternative routes for the re-alignment of the R545 were investigated by Jeffares and Green Consulting Engineers in consultation with relevant stakeholders. A report on the alternative routes was prepared in May 2009.

An investigation was undertaken by Synergistics Environmental Services (Synergistics, 2012) to identify the environmentally sensitive areas in the vicinity of the proposed route and to determine the environmental constraints that should be imposed on the proposed alignment of the R545. As part of this study an investigation into the impact of the proposed developments in the New Largo area on the traffic predicted to use the R545,

was undertaken by (WSP SA Civil and Structural Engineers (Pty) Ltd., 2011). The study was documented in the report entitled “S0403/TRA/00: New Largo Colliery Traffic Impact Assessment Report (Version 0)” prepared in August 2011. This report proposed the upgrading of several existing intersections to accommodate the predicted future traffic.

Discussions were held with officials of the Mpumalanga Department of Public Works, Roads and Transport in order to obtain their input on the proposed new alignment of the R545.

A Geotechnical investigation of the existing soil conditions along the route for the re-aligned section of the R545 was undertaken. Soil samples were collected and were tested at a materials laboratory. The findings of the investigation were documented in a report entitled “Geotechnical Report for New Largo Colliery R545 Road Deviation” numbered 000-0130-RPT0013.

Based on the findings of these studies and discussions and taking into consideration the merits and constraints of the various alternative alignments, a route passing to the east of the mining area was finally accepted and approved in principle.

3.5.1.3.5.1 Horizontal Alignment

Several alternative horizontal alignments were considered before finalizing the route of the re-aligned section of Road R545. This final alignment was determined subject to the following constraints:

- The road should be re-aligned on property controlled by New Largo Coal (wherever possible);
- The road should clear the 500m blasting zone for the new mine;
- The road should, as far as possible, avoid environmentally sensitive areas;
- The new road alignment should minimize the impact on existing services (e.g. overhead power lines).
- At its northern end, the R545 should intersect the existing road at a point opposite the new access road for the Kusile Power Station, which is currently under construction.

For a 100 km/hr design speed, the minimum permissible radius for a horizontal curve is specified as 350 metre (with a desirable minimum horizontal curve radius of 600 metre). Horizontal curves shall not be less than 300 metre in length.

The selected alignment of the R545, was Approved in Principle by the Mpumalanga Department of Public Works, Roads and Transport.

3.5.1.3.5.2 Vertical Alignment

For a 100 km/hr design speed, the minimum K value for a crest vertical curve is specified as 62; the minimum for a sag vertical curve is 37. The desirable minimum length of a vertical curve specified as 180 metre.

- Environmental Considerations

  The route for road R545 crosses several environmentally sensitive areas and these areas were avoided wherever possible. At the northern end of the re-alignment, the R545 is aligned to bypass to the north of the occurrence of the environmentally-sensitive *Frithia* plant. The section of R545 between 12 500km and 12 900km has been shifted northwards out of the mining property onto Portion 26 of Roodepoortjie 326 JR, to avoid the environmentally sensitive stream on the adjacent property.

- Traffic Considerations

A Traffic Impact Study, which assesses the impact of mining and other industrial development in the area, was prepared by WSP SA Civil and Structural Engineers (Pty) Ltd. This study predicts the future traffic on the R545 and proposes the upgrading of intersections on the R545 to accommodate this traffic. In terms of this report, the following existing intersections should be upgraded and traffic signals installed to accommodate the predicted traffic flows:

- The southern ramp terminal at the N12/R545 interchange; and
- The northern ramp terminal at the N12/R545 interchange.

The study proposes that a traffic circle should be constructed at the northern end of the proposed re-alignment of the R545 at its intersection with the new Kusile Road.

- Intersections
  - Major Intersections

At the northern end the re-aligned R545 will tie to the existing road at a T-junction, where it intersects with the new Kusile Road. A large number of turning movements are anticipated at this intersection and a large number of these will be right turns across opposing traffic. From a traffic safety perspective, it is proposed that a "Modern Roundabout" type traffic circle should be constructed at this new intersection. This type of intersection is particularly effective in handling opposed right-turning traffic safely. Traffic analysis undertaken in the Traffic Study prepared by WSP Engineers shows that a traffic circle will accommodate the predicted traffic volumes with minimal delay.

International experience indicates that Modern Roundabouts can be expected to operate with a higher degree of traffic safely than a normal intersection.

The roundabout should have an internal diameter of 80 metres and the width of the circulating roadway should be 10 metres wide. Depending on the proposed phasing of the mining operation, it may be necessary to initially construct all four approaches, although in the longer term the southern approach will become redundant and will be closed to traffic.

3.5.1.4 Pit D and Pit H Alternatives

The overland conveyor system will not be constructed until later in the project lifetime. Instead, coal will be trucked from Pits D and H (See Figure 8 for the trucking route overview).

- Pit D = 220 000 Tonne (T) per month at 25 working days per month = 275 truckloads per day on 32T coal road trucks; and
- Pit H = 200 000 T per month at 25 workings days per month = 250 truckloads per day on 32T coal road trucks.

The following trucking route alternatives were considered as valid options:

- Trucking route one from Pit D to Kusile Power Station;
- Trucking route two from Pit D to Kendal power station in the south;
- Trucking route three from Pit H to Kendal power station; and
- Trucking route four from Pit H to the Kusile Power Station in the north.

All four trucking routes are viable and are considered acceptable based on final agreements with Eskom regarding the coal resource qualities and Eskom's power generation demand requirements.

The following additional alternatives were deemed nonviable:

- Pit H infrastructure layout with the destoning plant located inside the pit – an option not operationally feasible as it leads to project facing challenges and sterilises portions of the coal reserve; and
- "No Go" alternative – not viable on economic grounds.

4.0 DESCRIPTION OF THE SCOPE OF THE OVERALL ACTIVITY

The Main New Largo resource is of a suitable quality to supply a power station employing pulverised coal combustion technology.

Based on the coal quality specifications provided by Eskom, the Kusile Power Station will require approximately 17 million sales tonnes per annum. When fully operational, the Kusile Power Station will consist of six units of 800 megawatts (MW) each and a total capacity of 4800 MW. First coal was supplied to the Kusile Power Station in 2015 from third party sources. Units 1, 2 and 3 are planned to be synchronized in 2020 and the Power Station is planned to be fully operational by 2023 until 2072.

4.1 Listed and Specified Activities

The listed activities associated with New Largo are authorised through an Environmental Authorisation (Mpumalanga Department of Economic Development, Environment and Tourism , 2013) and an Environmental Management Programme (Synergistics, 2012) approved by the DMR.

New Largo is authorised in terms of the 2010 NEMA EIA Regulations (GN R. 543) and since the regulations have changed subsequently, a comparison is made between these activities and the 2014 EIA Regulations (GN R. 326) (Appendix C).

Appendix C indicates that the current NEMA EIA listed activities do not significantly influence the activities that are already authorised. This analysis, considered together with the infrastructure associated with Pit H, concludes that this amendment does not trigger any new listed activities; no environmental authorisation is therefore required.

5.0 POLICY AND LEGISLATIVE CONTEXT

New Largo operates under legislative requirements of the MPRDA, NEMA, National Environmental Management: Waste Act (Act No. 59 of 1998) (NEM: WA) and the National Water Act (Act No. 36 of 1998) (NWA) (Synergistics Environmental Services, 2012). The legislation and all policies relevant to New Largo are briefly described in the following sections and are applicable throughout this entire document.

5.1 National Environmental Management Act

New Largo is associated with various infrastructure that is authorised in terms of the NEMA and the EIA regulations (Government Notice Regulation (GNR) 543 to 546, published 18 June 2010). The authorisations include:

- Environmental authorisation from the MDEDET in terms of NEMA and the Environmental Impact Assessment Regulations, 2010 (Government Notice 543 to 546, 18 June 2010) (Mpumalanga Department of Economic Development, Environment and Tourism , 2013); and
- Approved EMPr, in terms of the MPRDA, by the DMRE (Synergistics, 2012).

5.2 Mineral and Petroleum Resources Development Act

New Largo operates under the Mining Right (MP 30/5/1/2/2/511MR) granted by the DMRE in 2018.

5.3 National Water Act

New Largo operates under the following WULs:

- WUL: 04/B20G/ACFGIJ/2538, File: 16/2/7/B200/C528 dated 11 January 2015 (Integrated WUL);
- WUL: 04/B20G/CI/2246, File: 16/2/7/B200/C528 dated 22 August 2014 (R545 Provincial Road Re-alignment); and
- WUL: 04/B20F/ACFGI/2310, File: 16/2/7/B200/K524 dated 22 September 2013 (Phola – Kusile Conveyor).

New Largo has recently submitted to the DWS an amendment for the WUL to include Section 21(c) and (i) water uses for mining through the Honingkrantz Pan. In relation to the change in mine plan, it is anticipated that no water uses will require further authorisation.

Furthermore, a WUL application for Pit H is also going to be submitted, for the following water uses, which were not covered in the existing licences:

- Section 21 (a) taking water from boreholes (NSW10 and NSW2) and from the existing in-stream dam 1 and dam 2;
- Section 21 (f) discharging form the sewage treatment works;
- Section 21 (g) for the conservancy tank (during initial phase) x2 PCD's, dust suppression and the in-pit mineral residue disposal; and
- Section 21 (j) dewatering of Pit H.

5.4 National Environmental Management: Waste Act

The NEM: WA commenced on 1 July 2009. In terms of this Act, all listed waste management activities must be licensed and undergo an integrated with the environmental impact assessment process as stipulated in Section 44 of the Act.

Government Notice 921 lists the waste management activities that require licensing in terms of the NEM: WA. Amendments to these regulations, GN R. 632 (24 July 2015) are applicable to mining residue deposits and residue stockpiles.

Since the New Largo activities were authorised prior to 2015, all mine waste associated with New Largo is authorised under the existing EMPr, (Synergistics, 2012), while the non-mineralogical infrastructure associated is authorised under the following:

- Approved waste management licence, in terms of the NEMWA, by the National Department of Environmental Affairs and/or MDEDET (Licence No. 12/9/11/L952/6) (Department of Environmental Affairs and Tourism, 2015).

5.5 Other Legislation

5.5.1 Air Quality

5.5.1.1 National Environmental Management: Air Quality Act (NEM: AQA)

The National Environmental Management: Air Quality Act (NEM: AQA) has shifted the approach of air quality management from source-based control to the control of the receiving environment. The Act also devolved the responsibility of air quality management from the national sphere of government to the local municipal sphere of government (district and local municipal authorities). Local municipalities are thus tasked with baseline characterisation, management and operation of ambient monitoring networks, licensing of listed activities, and emission reduction strategies. The main objectives of the Act are to protect the environment by providing

reasonable legislative and other measures that (i) prevent air pollution and ecological degradation, (ii) promote conservation and (iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development in alignment with Sections 24a and 24b of the Constitution of the Republic of South Africa.

5.5.1.2 Ambient Air Quality Standards

The South African National Ambient Air Quality Standards (NAAQS) for common pollutants prescribe the allowable ambient concentrations of pollutants which are not to be exceeded during a specified time period in a defined area (Table 7). If the standards are exceeded, the ambient air quality is defined as poor and potential adverse health impacts are likely to occur.

Table 4: South African National Ambient Air Quality Standards

Pollutant	Averaging Period	Limit Value (µg/m^3)	Limit Value (ppb)	Frequency of Exceedance	Compliance Date
Nitrogen dioxide (NO_2) [(a)]	1 hour	200	106	88	Immediate
	1 year	40	21	0	
Particulate matter (PM_{10}) [(b)]	24 hours	75	-	4	Immediate
	1 year	40	-	0	
Ozone (O_3) [(c)]	8 hours (running)	120	61	11	Immediate
Lead (Pb) [(d)]	1 year	0.5	-	0	Immediate
Carbon monoxide (CO) [(e)]	1 hour	30 000	26 000	88	Immediate
	8 hours (calculated on 1 hourly averages)	10 000	8 700	11	
Benzene (C_6H_6) [(f)]	1 year	5	1.6	0	Immediate
Sulphur dioxide (SO_2) [(g)]	10 minutes	500	191	526	Immediate
	1 hour	350	134	88	
	24 hours	125	48	4	
	1 year	50	19	0	
Particulate matter ($PM_{2.5}$) [(h)]	24 hours	40		4	Immediate
	24 hours	25		4	1 January 2030
	1 year	20		0	Immediate
	1 year	15		0	1 January 2030

Notes:

a) The reference method for the analysis of NO_2 shall be ISO 7996;

b) The reference method for the determination of the particulate matter fraction of suspended particulate matter shall be EN 12341;

c) The reference method for the analysis of ozone shall be the UV photometric method as described in ISO 13964;

d) The reference method for the analysis of lead shall be ISO 9855;

e) The reference method for analysis of CO shall be ISO 4224;

f) The reference methods for benzene sampling and analysis shall be either EPA compendium method TO-14 A or method TO-17;

g) The reference method for the analysis of SO2 shall be ISO 6767; and

h) The reference method for the analysis of PM2.5 shall be EN14907.

5.5.1.3 National Dust Control Regulations

On 1 November 2013, the National Dust Control Regulations were promulgated under NEM: AQA and published in the Government Gazette No. 36974. The dust fall standard defines acceptable dust fall rates in terms of the presence of residential areas (Table 8). Importantly, all non-compliances require the submission of a dust fallout monitoring report to the local air quality officer.

Table 5: Acceptable dust fall rates

Restriction areas	Dust fall rate (mg/m^2/day over a 30 day average)	Permitted frequency of exceedance
Residential areas	Dust fall < 600	Two per annum (not in sequential months)
Non-residential areas	600 < Dust fall < 1 200	Two per annum (not in sequential months)

5.5.1.4 Highveld Priority Area Air Quality Management Plan

The New Largo operation is located within the Highveld. The Highveld area is associated with poor air quality and elevated concentrations of trace gas pollutants due to the region having a high concentration of industry, mining, power generation and other non-industrial sources (Held et al, 1996 and DEAT, 2006). For this reason, the Minister of Environmental Affairs declared the region a priority area, namely the Highveld Priority Area (HPA) in November 2007.

The primary motive of the Highveld Priority Area (HPA) declaration and the HPA Air Quality Management Plan (HPA AQMP) is to achieve and maintain compliance with the national ambient air quality standards across the HPA, using the constitutional principal of progressive realisation of air quality improvements (DEAT, 2007). The HPA AQMP thus allows for the alignment of air quality practices with legal and regulatory requirements to ensure air quality management planning is implemented effectively (DEAT, 2007). As the New Largo operations are located within the HPA and is thus required to operate within the air quality requirements of the HPA AQMP.

5.5.2 Noise

5.5.2.1 South African National Standard (SANS) for Noise

TheSouth African National Standard (SANS) Method for environmental noise impact assessment (SANS 10328:2008) provides a method for evaluating the noise impact of a proposed development. It is an umbrella document and makes many references to SANS 10103:2008 The measurement and rating of environmental noise with respect to annoyance and to speech communication (SANS 10103:2008).

The SANS 10103 Code of Practice provides typical ambient noise rating levels ($L_{Req,T}$) in various districts. The outdoor ambient noise levels recommended for the districts are shown in Table 6 below.

It is probable that the noise is annoying or otherwise intrusive to the community or to a group of persons if the rating level of the ambient noise under investigation exceeds the applicable rating level of the residual noise (determined in the absence of the specific noise under investigation), or the typical rating level for the ambient noise for the applicable environment given in Table 6.

Table 6: Typical Rating Levels for Ambient Noise

Type of district	Equivalent continuous rating level ($L_{Req.T}$) for noise (dB(A))					
	Outdoors			Indoors, with open windows		
	Day night $L_{R,dn}$	Day time $L_{Req,d}$	Nigh time $L_{Req,n}$	Day night $L_{R,dn}$	Day time $L_{Req,d}$	Night time $L_{Req,n}$
a) Rural districts	45	45	35	35	35	25
b) Suburban districts with little road traffic	50	50	40	40	40	30
c) Urban districts	55	55	45	45	45	35
d) Urban districts with one or more of the following: workshops; business premises; and main roads	60	60	50	50	50	40
e) Central business districts	65	65	55	55	55	45
f) Industrial districts	70	70	60	60	60	50

Notes:

1) If the measurement or calculation time interval is considerably shorter than the reference time intervals, significant deviations from the values given in the table might result;

2) If the spectrum of the sound contains significant low frequency components, or when an unbalanced spectrum towards the low frequencies is suspected, special precautions should be taken, and specialist advice should be obtained. In this case the indoor sound levels might significantly differ from the values given in Column 5 to 7;

3) In districts where outdoor $L_{R,dn}$ exceeds 55 dB, residential buildings (e.g. dormitories, hotel accommodation and residences) should preferably be treated acoustically to obtain indoor $L_{Req,T}$ values;

4) For industrial districts, the $L_{R,dn}$ concept does not necessarily hold. For industries legitimately operating in an industrial district during the entire 24 h day/night cycle, $L_{Req,d}$ =, $L_{Req,n}$ = 70 dB can be considered as typical and normal;

5) The values given in columns 2 and 5 in this table are equivalent continuous rating levels and include corrections for tonal character, impulsiveness of the noise and the time of day;

6) The values given in columns 3, 4, 6 and 7 in this table are equivalent continuous rating levels and include corrections for tonal character and impulsiveness of the noise; and

7) The noise from individual noise sources produced, or caused to be produced, by humans within natural quiet spaces such as national parks, wilderness areas and bird sanctuaries should not exceed a maximum A-weighted sound pressure level of 50 dBA at a distance of 15 m from each individual source.

SANS 10103 provides criteria for evaluating the community or group response to a noise source, these are presented in Table 7.

Table 7: SANS 10103 Categories of community or group response

Excess, $\Delta L_{Req,T}$ dB(A)	Category	Description
0 to 10	Little	Sporadic complaints
5 to 15	Medium	Widespread complaints
10 to 20	Strong	Threats of community or group action
>15	Very Strong	Vigorous community or group action

SANS 10103 provides three methods for determining the excess level ($\Delta L_{Req,T}$) of a proposed development:

- ΔLReq,T = LReq,T of ambient noise under investigation MINUS LReq,T of the Residual noise (determined in the absence of the Rated noise, i.e. the specific noise under investigation);
- ΔLReq,T = LReq,T of ambient noise under investigation MINUS the typical Rating level for the applicable district as determined from Table 7 (above) from SANS 10103:2008; or
- ΔLReq,T = Expected increase in LReq,T of ambient noise in an area because of a proposed development under investigation.

Blasting and Vibration

Although no specific South African standard limits have been set for blasting and vibration impacts, the following limits have been imposed on New Largo Coal via the approved EMP:

- A 500-meter safety zone around the perimeter of blasting to be maintained and evacuated during blasting, unless approval for relaxation of the 500 m safety zone has been obtained from the relevant authorities;
- Limit vibration to below 7.0 mm/s at points of concern such as occupied residences / areas where people live;
- Air blast levels should not exceed 128 dB at points of concern such as occupied residences / areas where people live;
- Strict control needs to be applied to prevent fly rock from posing a risk where blasting occurs within 1 200 m from any occupied residence and areas where people live;
- Design blasts for vibration amplitudes below 25 mm/s at any part of a Transnet pipeline;
- Design blasts for vibration amplitudes below 50 mm/s at any part of other pipelines; and
- Design blasts for vibration amplitudes below 150 mm/s at any part of a road (R545, N4, N12).

5.5.2.2 Heritage

The National Heritage Resources Act (NHRA 25 of 1999) is applicable to visual resources such as cultural landscapes, proclaimed buildings and sites, nature reserves, and proclaimed scenic routes. Section 38 of the NHRA provides that the heritage resources authority be notified and the necessary assessment undertaken, where a development < 5000 m^2 is proposed.

5.5.2.3 Biodiversity

The National Environmental Management: Biodiversity Act (10 of 2004) (NEMBA) provides for the management and conservation of South Africa's biodiversity within the framework of the NEMA; the protection of species and ecosystems that warrant national protection; the sustainable use of indigenous biological resources; the fair and

equitable sharing of benefits arising from bioprospecting involving indigenous biological resources; the establishment and functions of a South African National Biodiversity Institute; and associated matters. It includes provision for:

- The management of invasive species (Alien and Invasive Species Lists, 2016; draft Amendments to the Alien and Invasive Species Lists, 2018);
- Conservation of threatened or protected species and ecosystems; and
- Norms and standards for biodiversity management plans.

The draft National Biodiversity Offset Policy (2017) sets out a framework for the design and implementation of offsets for species and habitats of concern. Should future updated ESIAs for New Largo Coal as part of the environmental authorisation amendment process indicate that significant residual impacts remain on biodiversity features of concern following the application of the mitigation hierarchy, offsets may need to be designed and implemented via a Biodiversity Action Plan.

The South African National Biodiversity Institute (SANBI) have developed National Wetland Offset Guidelines (Macfarlane et al., 2014) which is the official DWS endorsed standard for developing wetland offsets. The document sets out recommendations for the assessment of impacts on wetlands in order to identify wetland offset requirements, identification and assessment of offset receiving sites for water resources and ecosystem services, and the implementation of wetland offset/mitigation strategies.

5.5.3 International Guidelines

World Bank Group Environmental, Health, and Safety Guidelines

The World Bank Group Environmental, Health, and Safety Guidelines (known as the ‘EHS Guidelines’) were developed in 2007. They are intended to be living documents and are occasionally updated.

The EHS Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP), as defined in the International Finance Corporation (IFC's) Performance Standard 3: Resource Efficiency and Pollution Prevention. IFC uses the EHS Guidelines as a technical source of information during project appraisal activities, as described in IFC's Environmental and Social Review Procedures Manual.

The EHS Guidelines contain the performance levels and measures that are normally acceptable to the IFC and that are generally considered to be achievable in new facilities at reasonable costs by existing technology. For IFC-financed projects, application of the EHS Guidelines to existing facilities may involve the establishment of site-specific targets with an appropriate timetable for achieving them. The environmental assessment process may recommend alternative (higher or lower) levels or measures, which, if acceptable to IFC, become project or site-specific requirements.

In cases where South Africa’s national regulations differ from the levels and measures presented in the EHS Guidelines, the Project will be required to achieve whichever is more stringent, should international financing be sought. Since the requirements of the South African national standards set out in the preceding sections are generally in accordance with the requirements of the EHS guidelines, achieving the national standards as required in the existing authorisations should be sufficient in also satisfying international financing requirements from an EHS perspective.

A potential exception to this statement is likely to apply to biodiversity (including wetlands) which is governed by IFC’s Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources (2012) and the accompanying Guidance Note (GN6) which was recently updated in June 2019. The requirements of PS6 in terms of no net loss of natural habitats and net gain of critical habitats are more stringent

than the requirements set out in the existing environmental authorisation as well as those detailed in the water use license.

International Finance Corporation and World Health Organisation Air Quality Guidelines

As the proposed New Largo project requires international funding, the project must be benchmarked against South African air quality standards, the IFC Performance Standards and the standards set out in the IFC EHS Guidelines and the current World Health Organisation (WHO) Air Quality Guidelines. The IFC EHS Guidelines advise that “relevant standards” with respect to ambient air quality are national legislated standards or, in their absence, the current WHO Air Quality Guidelines or other internationally recognised sources. As South Africa has its own nationally legislated standards, these have been used to determine significance of the potential air quality impacts.

The WHO guidelines are intended to support actions for air quality at the optimal achievable level for public health protection in different contexts. WHO does not formally prescribe how these guidelines should be used but does provide “Interim Targets” to aid in policy development to bring air quality in line with the proposed guideline values. Furthermore, the IFC EHS Guidelines suggest that emissions should not contribute more than 25 percent of the relevant air quality standards to allow additional, future sustainable development in the same airshed. It also states that projects located within poor quality airsheds (if the nationally legislated standards are exceeded significantly), should ensure that any increase in pollution is as small as feasible, and amounts to a fraction of the applicable short term and annual average air quality guidelines.

International Standards and Guidelines – Environmental noise

The WHO together with the Organization for Economic Co-ordination and Development (OECD) have developed guidelines based on the effects of the exposure to environmental noise. WHO recommends a standard guideline value for average outdoor noise levels of 55 dB(A) is applied during the daytime in order to prevent significant interference with the normal activities of local communities. The relevant night-time noise level is 45 dB(A). WHO further recommends that, during the night-time, the maximum level of any single event should not exceed 60 dB(A) in order to avoid sleep disruption. Specific ambient guidelines are also set for dwellings, bedrooms and schools

5.6 Previous Environmental Impact Assessment Process

An EIA process for opencast mining of the New Largo coal reserve was initiated in 2006. The process included participation by stakeholders and the development of a stakeholder issues and response report. The project was delayed in 2007 and then postponed due to AAIC internal planning requirements.

After the EIA regulations changed in 2010, a new application for environmental authorisation was lodged when AAIC re-initiated the project planning process. Stakeholders again had the opportunity to participate during a full EIA process. The information gathered during 2006/07 was used in the draft EIA Report to supplement new data collected after the environmental baseline studies were re-initiated in 2010.

The EIA for New Largo Colliery, which included the Main New Largo Mine, was completed and submitted in 2012 (Synergistics, 2012); DMR: 30/5/1/2/2/511MR F/2011/04/14/002). The application for the Project was authorised on 06-02-2013.

The various stages of the previous EIA process are summarised in the sections that follow. The key information produced in the 2012 EIA process (specialist impact assessments, as relevant) are appended to this report (Appendix C).

5.6.1 EIA Scoping Process and Study Outcomes

A scoping study was conducted as the first phase in the EIA process by Synergistics (2012). During the scoping phase, the following tasks were completed:

a) Project and baseline environmental information were collated. Baseline information for this scoping report was gathered through visual inspections of the project area and surroundings, desktop studies and review of existing reports.

i) Landowners, adjacent landowners, local authorities, environmental authorities, as well as other stakeholders which may be affected by the project, or that may have an interest in the environmental impacts of the project were identified.

j) Interested and affected parties (I&APs) were informed about the proposed project.

k) Public meetings were arranged, and I&AP issues and concerns were identified.

l) Environmental authorities were consulted to confirm legal and administrative requirements.

m) Environmental issues and impacts were identified and described.

n) Development alternatives were identified and evaluated, and non-feasible development alternatives were eliminated.

o) The nature and extent for further investigations and specialist input required in the EIA phase was identified.

p) The draft and final scoping reports were submitted for review by authorities, relevant organs of state and I&APs.

q) Key I&AP issues and concerns were collated into an issues and response report for consideration in the EIA phase.

6.0 NEED AND DESIRABILITY

The key objective of the New Largo Coal Mine Project is the production of coal to meet the country's integrated resource plan (IRP) objectives. The presence of the New Largo coal reserve played a significant role in determining the locality of the Kusile Power Station and is strategically situated for further distribution of coal to different power stations. This section describes the importance of New Largo by giving a brief overview of the coal market.

6.1 South African Domestic Coal Market

The South African domestic market principally comprises the acquisition by Eskom of around 130 Mtpa of thermal coal to fire its fleet of power stations. In addition, around 20 Mtpa of thermal coal is burned by various internal industries including sugar, paper and healthcare. The principal focus of this domestic market analysis is on Eskom and its coal requirements.

In South Africa, thermal coal is currently responsible for 90% of the countries' power generation with South Africa the 7th largest producer of coal globally, accounting for 94% of Africa's total coal production. As with the developing nations of India and southeast Asia, the story in Africa is expected to be similar, with continued support for coal fired power generation needed to keep up with population and development growth. Coal production in Africa is limited to the sub-Sahara with major projects in South Africa, Botswana, Zimbabwe and Mozambique. Following the long-awaited update to the original 2011 Integrated Resource Plan, coal is still expected to contribute over 60% of power generation in South Africa in 2030 (Forbes, 2019).

In the last few years, the lack of incremental coal fired capacity, growth in power demand and cessation of ability to defer essential power station maintenance has created a situation where Eskom's reserve margins have run at bare break-even levels, with resultant sporadic load-shedding between 2008 and 2014. These cuts since

returned in 2018, contributed to by coal supply shortages at as many as seven power stations in Mpumalanga Province (Reuters, 2018) and delayed maintenance plans that put a strain on plant availability.

The figure below illustrates the existing base load power stations principally located in western Mpumalanga Province in the region of the New Largo Coal Mine Project. It also identifies Eskom's two new build facilities; Medupi and Kusile. Considering construction delays, and the increasing need to transport coal from stockpiles in Limpopo Province to supply its plants in Mpumalanga, there is increasing pressure for Eskom to secure a new reliable coal supply close to Kusile.

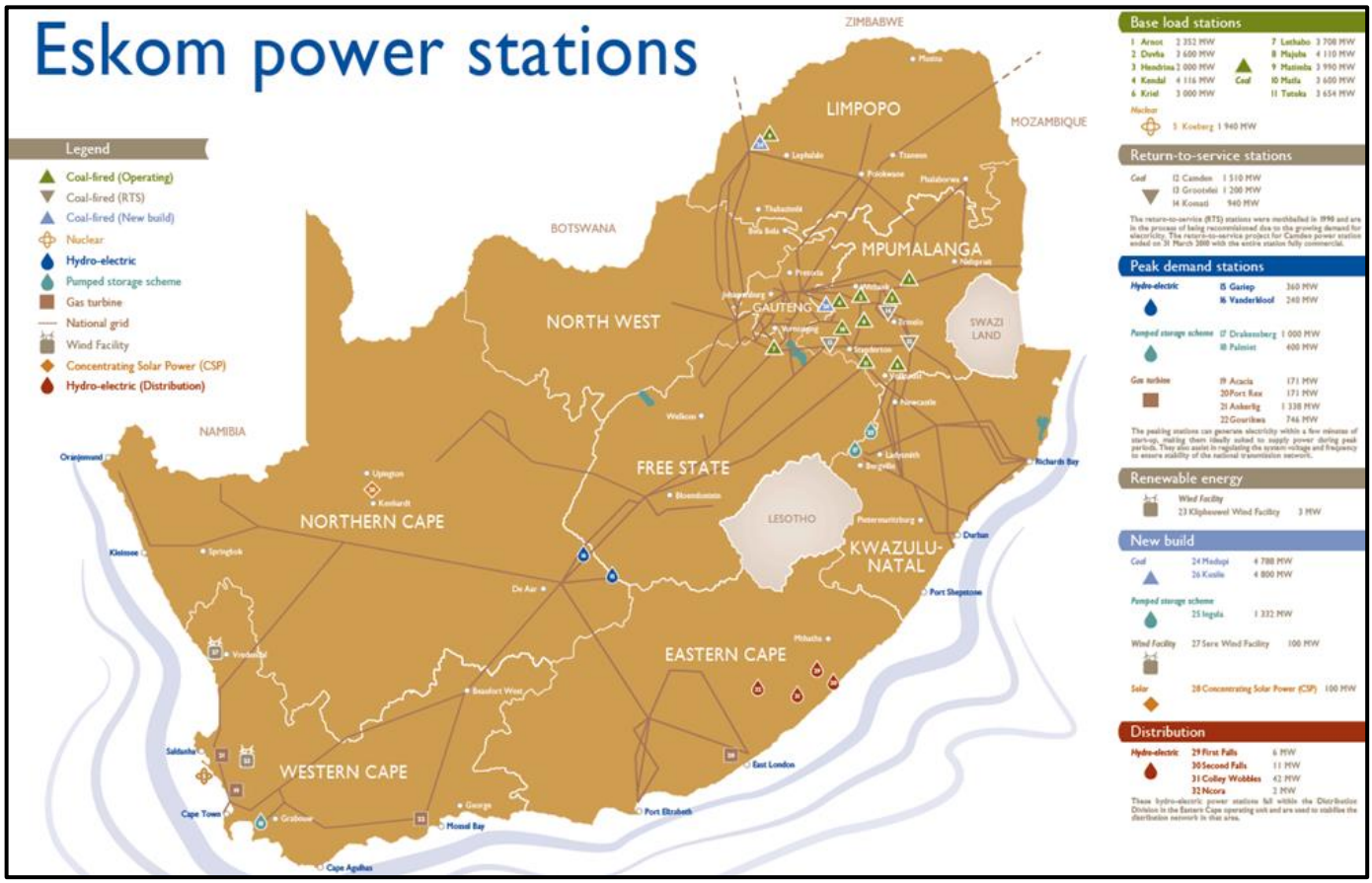

Figure 13: Eskom power stations and distribution map

6.2 Eskom Power

Eskom's power station fleet essentially falls into three coal quality bands. The older stations typically burn higher Calorific Value (CV), lower ash coal whilst the new stations can burn lower CV, higher ash coal.

Table 8: South African power station qualities

Station	Coal source	Max burn (Mtpa)	Expected coal CV* (MJ/kg)
Camden	None	7	24.2
Arnot	Arnot Colliery	8	23.8
Kriel units 1-3	Kriel Colliery	6	23.1
Tutuka	New Denmark Colliery	13	22.5
Hendrina	Optimum Colliery	8	22.2
Duvha	Middelburg Mine Services	14	21.9
Grootvlei	None	6	21.4
Majuba	Being contracted	14	21.4
Komati	None	4.5	21.0
Kriel units 4-6	Kriel Colliery	6	20.6
Matla	Matla Colliery	15	20.5
Kendal	Khutala Colliery	16	19.2
Kusile**	New Largo	17	18.8
Matimba***	Grootegeluk	15	20.4
Medupi***	Grootegeluk	17	20.4
Lethabo	New Vaal Colliery	18	16.0

*CV measured on an air-dried basis; note that other quality parameters (ash, sulphur, volatiles, abrasiveness) are as important as CV. Each station has a delay reject limit that is lower than the expected quality. Source: Eskom. **Resource committed, but project still under development ***Coal is of a different quality to the Mpumalanga coal, with very high volatiles

High quality

- Older stations requiring high quality coal
- Compete directly with in-situ grades for export coal

Intermediate quality

- Can generally use middling grade coal from RB1 exports
- Compete directly with lower grade exports

Lower quality

- Newer stations designed to operate on low in situ grade coal
- No direct competition with exports

6.3 Kusile Power Station

In 2005, AAIC were originally approached by Eskom to evaluate the potential to supply coal to the proposed Kusile Power Station, located immediately adjacent to the North of their New Largo Coal Mine Project.

The Kusile Power Station has been designed to comprise six 800MW units for a total installed capacity of 4 800MW once completed, and in doing so will be the fourth-largest coal-fired power station worldwide with an expected operational lifespan of approximately 50 years. The facility will also be the first flue-gas desulphurisation (FGD) plant in South Africa.

In December 2016 Unit 1 was synchronised with the South African grid, coming online commercially in August 2017. Unit 2 achieved full commercial operation in October 2020. Units 3 to 6 are planned to come online sequentially over the next few years. Kusile will require 15 to 17 Mtpa of thermal coal at full load.

6.4 Pit H Need and Desirability

Since initial inception between AAIC and Eskom in 2005, the New Largo Coal Mine Project, in particular, has been considered a key deposit, critical to the medium to long-term power generation for the Kusile Power Station. Following the completion of a number of feasibility studies by AAIC and New Largo Coal, the Pit H deposit has been delineated as a separate 'development-ready' coal resource within the main project.

Pit H boasts particularly shallow coal (generally within 50 m depth) occurring as a smaller sub-basin separate from the main New Largo deposit further to the north. The resultant low stripping ratio allows for low mining costs. The site is also supported by existing road infrastructure that will be able to easily transport coal 15 km

to the north to Kusile, or south to Kendal. It is expected that pre-stripping at Pit H will begin in Q1 2022 , with coal extraction ramping up throughout Q2 2022, and reaching full production of 3 Mtpa by Q3 of 2022.

Once in operation, Pit H is planned to produce a minimum of approximately 3 Mtpa of ROM coal over a total mine life of at least thirteen years. At full production the mine is expected to employ around 150 people, with the much of the projected labour force intended to be sourced from the primary and secondary community zones of influence. It is proposed that the coal will be transported by road the short distance from the mining area to the Kusile Power Station, 15 km to the north, to supply coal to Eskom. Kendal Power Station represents an alternative option for supply, being located approximately 9 km to the south.

Kusile's second unit (Unit 2) came online commercially in October 2020. Unit 2 requires approximately 2.5 Mtpa of coal – which can be met directly by Pit H. Discussions are ongoing between New Largo Coal and Eskom about this supply. Further New Largo coal supply could support the ramp-up in power generation capacity from Kusile, as Unit 3 comes on online in 2030, and beyond. Because mining is now starting earlier than originally planned at Pit H, infrastructure including haul roads, access roads, product stockpiles, destoning plant, and a Pollution Control Dam (PCD) with a silt trap for dirty water management, is necessary to support the commencement of mining at this location. The destoning plant separates rock from coal, which is necessary to deliver coal of a standard that satisfies the specification set by Eskom.

The amendment to the mine schedule and earlier mining of Pit H, including development of supporting infrastructure at Pit H, will enable New Largo to access higher grade coal reserves at an earlier stage of the Life-of-Mine (LoM) than envisaged in the original mine plan. This is essential as coal currently provides for most of South Africa's primary energy needs. The target destinations are expected to be Eskom (Kendal and Kusile Power Station) and other power producers within South Africa but may vary as market conditions dictate from time to time. The mine will potentially contribute to the reduction of the domestic shortfall of coal, helping Eskom to ensure a sustainable supply of power, which the South African economy depends on.

The additional ecological impacts of the construction and operation of the infrastructure now required at Pit H are expected to be minimal, since although the infrastructure footprint will now be larger, the infrastructure will be located in an area that is currently occupied by maize fields; and as such, no significant additional impacts on ecosystems or biological diversity are anticipated.

6.5 Pit D

No new infrastructure is required at Pit D to support mining at this location, since this pit will be mined from the western direction from the neighbouring existing Africoal Klipfontein mine, whose existing infrastructure will be used to support mining at Pit D.

The amendment to the mine schedule and earlier mining of Pit D will enable New Largo to access higher grade coal reserves at an earlier stage of the Life-of-Mine (LoM) than envisaged in the original mine plan. This is essential as coal currently provides for most of South Africa's primary energy needs. The target destinations are expected to be Eskom (Kendal and Kusile Power Station) and other power producers within South Africa but may vary as market conditions dictate from time to time. As is the case for Pit H, the coal from Pit D will potentially contribute to the reduction of the domestic shortfall of coal, helping Eskom to ensure a sustainable supply of power, which the South African economy depends on.

The mining footprint of Pit D comprises mostly cultivated fields (soy), with some areas of disturbed secondary grassland, and hillslope seeps; since no infrastructure is proposed at Pit D, no additional ecological impacts to those already assessed in the 2012 EIA, and subsequently authorised, are expected.

6.6 Phase 0 off-loading facility

Phase 0 entails the construction and operation of a product coal off-loading facility adjacent to the MRA boundary with Kusile Power station, with associated required conveyor flights to convey coal to the Kusile coal stockpiling area, and the (authorised) northern access road.

The need for the Phase 0 infrastructure has been precipitated by the need to truck coal from Pit D and Pit H to Kusile Power Station, since the (authorised) conveyor will only be constructed later in the life of mine. In addition, the current high levels of coal truck traffic delivering coal in the quantities required to supply Kusile is causing backlog in their stockyard; the construction and operation of the Phase 0 infrastructure will allow New Largo to avoid contributing to delays in coal delivery, and assist Eskom to ensure a sustainable supply of power to the national grid, which the South African economy depends on. Some of the infrastructure that will be constructed as part of Phase 0 has been previously authorised (e.g. the access road), although some will be located in a slightly different location to what is now being proposed (e.g the site offices) (Figure 9).

The ecological impacts of the construction and operation of the Phase 0 infrastructure are expected to be minimal, since although the infrastructure footprint will be larger, the infrastructure will be located in an area that is currently occupied by maize fields; and as such, no significant impacts on ecosystems or biological diversity are anticipated.

7.0 PUBLIC PARTICIPATION PROCESS

This section provides an overview of the public participation process undertaken for the original New Largo EMPr (Section 7.1) and for the EMPr Amendment process (Section 7.2). The full report for the public participation process conducted in 2011-2012 is appended to the EIA report appended in Appendix C, while the public consultation documents generated for this EA/EMPr amendment process is presented in Appendix D.

7.1 Summary of Public Participation undertaken in 2012

7.1.1 Public Participation Process undertaken

During the EIA previously conducted for New Largo Colliery (Synergistics, 2012), potential Interested and Affected Peoples (I&APs) were identified through networking and the use of the AAIC and Eskom I&AP databases developed since 2006. The existing databases included landowners, neighbouring landowners and people who participated in previous EIA processes in the area. Press advertisements and site posters were used to identify new I&AP's.

A background information document (BID) was circulated in March 2011 to all landowners either personally or via registered mail, while all the identified I&APs received an electronic copy via e-mail.

Another BID focusing on the proposed R545 road deviation was distributed in July 2011 to all landowners either personally or via registered mail, while all the identified I&APs received an electronic copy via e-mail. Both these documents included a response sheet and a request for written comments. The BID distributed in July 2011 also highlighted the proposed New Largo Colliery project and invited participants to participate in the EIA process.

General public meetings were held on 12 and 13 May 2011 and a meeting was also held on 20 May 2011 with Dr. Koos Pretorius of the Federation for a Sustainable Environment, Ms Carol Wentzel and Ms Annamie Duvenhage from the Bronkhorstspruit and Wilge River Conservation Association in Witbank to discuss the proposed project with them.

A water focus group meeting was held on 26 July 2011 that was attended by approximately 80 people. Concerns regarding water resources were discussed. This meeting came about through a special request by stakeholders

during the public meetings which were held on 12 and 13 May 2011. The Draft EIA for the New Largo Feasibility Study went out for review and public consultation during March 2012.

A public meeting was held on the 6th of March 2012 to provide feedback on specialist findings and environmental impacts. An open house session was held from 11h00 to 18h00 where each I&AP could discuss specific environmental issues and concerns. These concerns were captured in the Issues and Response Report and were updated for the Final EIA.

With regards to grave and community relocations, a separate engagement process was followed by Professional Grave Solutions and Digby Wells respectively.

All affected landowners were contacted on an individual basis to discuss their concerns and specific impacts or current environmental and property status on their land. This process continued throughout the EIA process, and was detailed in the Final EIA report.

7.1.2 Summary of key issues raised

Key issues / comments raised during the 2012 EIA process by authorities and I&APs included:

- Loss of wetlands;
- Possible lack of completed Wetland offset plan in advance of construction;
- Late start to construction of New Largo Coal Mine would impact on delivery of coal to Kusile, thus compromising national electricity generation and supply;
- Economic benefits of New Largo Coal Mine and Kusile;
- Economic feasibility of the water treatment plant to treat water for many years post closure;
- Impact on the availability of clean water and impacts on downstream environments;
- Loss of arable land and food production, land capability;
- Air quality (New Largo Coal will operate in an area with elevated baseline emission levels);
- Impacts on neighbours (most of the negative social impacts of a project such as New Largo Coal Mine are often experienced locally by the people living in close proximity to the project);
- Relocation of a section of a Provincial Road (the R545 north-south link between the N4 and N12);
- Impact on grassland remnants currently remaining within mining footprint;
- Impact on localized Frithia humilis found on rocky area in northern portion on mining area;
- Concerns that the proponent would not deliver on the commitments in the EMP;
- Impact on properties directly affected by mining (landowners, farm workers, people living on the land, tenants); and
- Job losses and social impacts at closure.

Each of the key issues were addressed in the 2012 EIA report and EMP.

7.2 Public Consultation Process for the EMPr Amendment

7.2.1 Objectives of Public Participation

Opportunities for Comment

Documents are made available at various stages during the EMPr Amendment process to provide stakeholders with information, further opportunities to identify issues of concern and suggestions for enhanced benefits, and to verify that the issues raised have been considered.

The public participation process is designed to provide information to and receive feedback from I&APs throughout the EMPr Amendment process, thus providing organisations and individuals and other stakeholders with an opportunity to raise concerns and provide comments and suggestions regarding the proposed project.

The principles that determine communication with society at large are included in the principles of the NEMA (Act 107 of 1998, as amended) and are elaborated upon in General Notice 657, titled “Guideline 4: Public Participation” (Department of Environmental Affairs and Tourism, 19 May, 2006), which states that: “Public participation process means a process in which potential I&APs are given an opportunity to comment on, or raise issues relevant to, specific matters.”

Public participation is an essential and regulatory requirement for a EMPr Amendment process and will be undertaken in terms of Chapter 6 of the EIA Regulations GN R.326. Public participation is a process that is intended to lead to a joint effort by stakeholders, technical specialists, the authorities and the proponent/developer who work together to produce better decisions than if they had acted independently.

The public participation process is designed to provide sufficient and accessible information to I&APs in an objective manner.

7.2.2 Pre-application Phase Capacity Building

New Largo Coal started operations at Pit D in 2020 and is therefore a relatively new existing operation. As part of the commencement of the mining operation, New Largo has been actively engaging with landowners and affected communities. During these meetings, the various mining processes and associated impacts have been discussed, and progress feedback provided.

Furthermore, Focus Group Meetings have been convened with the local farmers (on 18 September 2020) and the Kendal community forum (on 21 October 2020). The key purpose of these meetings was to share information about the project and the EA/EMPr Amendment and WUL application processes; and for I&APs to ask questions, raise issues of concern, contribute comments and suggestions for enhanced benefits.

The meeting invitation letters, presentations and attendance registers are appended in Appendix D.

7.2.3 Identification of I&APs

The existing I&AP database generated as part of the 2012 public participation process, has been updated through a process of networking and referral, obtaining information from the recent meetings New Largo Coal has had with stakeholders, as well as the Focus Group Meetings. The I&AP database for the project is appended in Appendix D. There are currently 287 stakeholders on the I&AP database.

7.2.4 Registration of I&APs

The NEMA Regulations distinguish between I&APs and registered I&APs.

I&APs, as contemplated in Section 24(4) (d) of the NEMA include: "(a) any person, group of persons or organisation interested in or affected by an activity; and (b) any organ of state that may have jurisdiction over any aspect of the activity".

In terms of the Regulations:

"An EAP managing an application must open and maintain a register which contains the names, contact details and addresses of:

Please register as an I&AP

Stakeholders are encouraged to register as I&APs and participate in the consultation processes by completing the Registration and Comment sheet and returning it to the Public Participation Office. The Registration and Comment Sheet can also be completed on-line via Golder's website: www.golder.com/public.

a) All persons who; have submitted written comments or attended meetings with the applicant or EAP;

b) All persons who; have requested the applicant or EAP managing the application, in writing, for their names to be placed on the register; and

c) All organs of state which have jurisdiction in respect of the activity to which the application relates."

As per the EIA Regulations, future consultation during the impact assessment phase will take place with **registered I&APs**. Stakeholders who were involved in the initial consultation and who attended the focus group meetings have been added to the register. The I&AP register will be updated throughout the EMPr Amendment process.

7.2.5 Project Announcement

The proposed project will be announced on Friday, **20 November 2020**. Stakeholders will be invited to participate in the EMPr Amendment and public participation process and to pass on the information to friends/colleagues/neighbours who may be interested and to register as I&APs.

The proposed project will be announced as follows:

- Distribution of the background information document and a letter of invitation to participate to all I&APs on the database, accompanied by a registration, comment and reply sheet that was mailed/emailed to the entire stakeholder database. Copies of the announcement documents are attached in Appendix D;
- The above-mentioned documents will be available at the public places listed below and posted to the Golder website www.golder.com/public;

Place	Address
Phola Police Station	2171 Mthimunye Street, Phola
Ogies Police Station	1 Main Road, Ogies
eMalahleni Main Library	Cnr. Hofmeyer and Elizabeth Avenue, eMalahleni
Golder Associates Africa, Maxwell Office Park, Magwa Crescent West, Waterfall City, Midrand	Building 1, Maxwell Office Park, Magwa Crescent, Waterfall City, Midrand, 1865

- A newspaper advertisement will be published in the Witbank News, on **20 November 2020**; and

- Site notices will be placed at the entrance to the proposed project site and at visible places at the boundary of the property.

7.2.6 Draft EMPr Amendment Report

The draft EMPr Amendment Report will be available for public review until **11 January 2021**. The report will be available at the public places listed above and posted to the Golder website www.golder.com/public.

An additional focus group meeting, and a public meeting will be convened during the public review period, both of which will comply with the National COVID-19 Regulations. Invitation letters to these meetings will be sent out during the public review period.

7.2.7 Final EMPr Amendment Report

The EMPr Amendment Report will be updated after the expiry of the public review period. All the issues, comments and suggestions raised during the comment period on the draft EMPr Amendment report will be added to the comments and response report (CRR) that will accompany the Final EMPr Amendment report. The Final EMPr Amendment report will be submitted to the DMRE, and the DWS.

On submission of the Final EMPr Amendment report to the authorities, a personalised letter will be sent to every registered I&AP to inform them of the submission and the opportunity to request copies of the final reports.

7.2.8 Lead Authority's Decision

Once the DMRE has taken a decision about the proposed project, the Public Participation Office will immediately notify I&APs of this decision and of the opportunity to appeal. This notification will be provided as follows:

- A letter will be sent, personally addressed to all registered I&APs, summarising the authority's decision and explaining how to lodge an appeal should they wish to.

7.2.9 Summary of Issues Raised thus Far

The issues raised by stakeholders in the recent Focus Group Meetings as part of the EA/EMPr Amendment and WULA processes, can be summarised as follows:

7.2.9.1 Focus Group Meeting with Affected Farmers

The issues / concerns raised during the focus group meeting of 18 September 2020 are summarised as follows:

- Concerns relating to impact on yield and quality of borehole water;
- Concerns related to the impact the project may have on people's livelihoods and jobs in the area;
- Limitations to further expansions of local businesses, e.g. chicken farms, due to the Kusile Power Station and the New Largo Coal Mine;
- Proximity of chicken farm to Pit D operations and associated impacts, specifically pertaining to biosecurity; and
- Concerns related to safety risks in areas that were previously fenced off for safety reasons, but are currently not fenced since the fences have been removed.

7.2.9.2 Focus Group Meeting with Kendal Community Forum

The issues / concerns raised during the focus group meeting of 21 October 2020 are summarised as follows:

- Concerns about the proximity of Pit H infrastructure to Kendal community;
- Concerns relating to the timing of relocating farmworkers' families;

- Concerns relating to further water quality and quantity impacts on community boreholes;
- Concerns related to the dilapidated state of municipal infrastructure and gravel roads, and whether New Largo Coal will assist the community in this regard, including provision of electricity;
- Concerns related to blasting procedures and blasting causing cracks in homes and responsibilities / grievance mechanisms for addressing complaints; and
- Concerns that the relocation of the R545 will affect the community with regard to access to Ogies, Wilge and other farming areas.

Refer to Appendix D for the full Comment and Response Report capturing the issues raised during the Focus Group Meetings.

8.0 BASELINE ENVIRONMENTAL ATTRIBUTES

A baseline environment description for the New Largo Coal Mine Project area was compiled by Synergistics in 2011 to 2012 from data gathered via visual inspections of the project area and surroundings, desktop studies and review of existing reports, for the physical environment (climate, topography, soils, geology, air quality, noise, surface water and ground water), biological environment (flora, fauna and wetlands) and socio-economic environment (economic features, population structure, employment, land use, land ownership, land claims and cultural heritage). Where still relevant, key findings from these studies are summarised below, with the full reports appended hereto in Appendix C.

Key components of the 2012 baseline description were updated accordingly for this EA/EMPr amendment, including surface water, groundwater, wetlands, terrestrial and aquatic biodiversity, air quality, noise, heritage, palaeontology, traffic and social aspects. These reports are appended in Appendix E.

8.1 Meteorological Overview

8.1.1 Rainfall

To assess rainfall conditions, the meteorological station based in the town of Ogies (located 4.5 km's south-east of New Largo's MRA) was utilised to provide an understanding of the meteorological characteristics. Due to the very close proximity of this station to New Largo, the experienced meteorological conditions at this station are anticipated to be very similar to that experienced at New Largo. The South African National Accreditation System (SANAS, 2012) TR 07-03 standards stipulate a minimum data recovery of 90% for the dataset to be deemed representative of conditions during a specific reporting period. The percentage recovery for parameters recorded exceeded 90% and is thus considered reliable for use in this assessment. Rainfall is a key influencing factor in ambient air quality:

- Rainfall is typically much higher during the spring and summer months, where approximately 90% of the annual precipitation occurs between October through to April. Little rainfall occurs during the autumn and winter months between May to September. The driest month is usually July. Precipitation usually reaches its peak in January, where in 2019 there was an average of 92 mm. Figure 14 depicts the monthly average rainfall data as observed at Ogies over 2019.

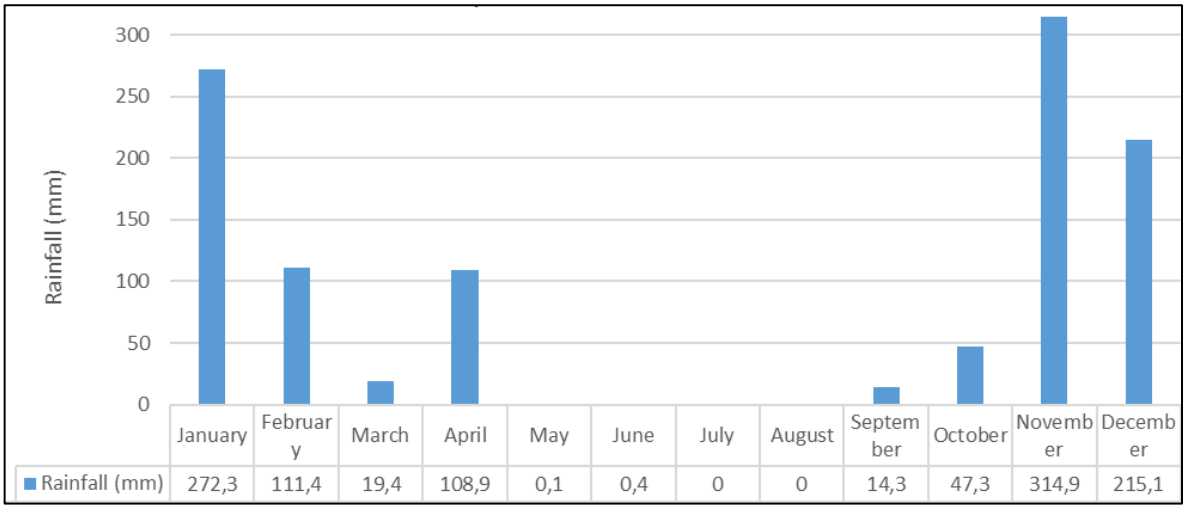

Figure 14: Monthly rainfall at Ogies during 2019 (Source: https://www.worldweatheronline.com/ogies-weather-averages/mpumalanga/za.aspx, 19/05/2019)

8.1.2 Temperature

Ogies and New Largo fall within semi-arid climatic conditions, where temperatures are generally warm and temperate with warm summers and cold winters usually associated with frost. The annual average temperature is approximately 16°C. The temperature in January (i.e. during the summer season) averages approximately 20°C, however daily maximum temperatures may exceed 27ºC on occasion. June and July are the coldest months (i.e. the winter season), with temperatures averaging approximately 9°C (https://en.climate-data.org/africa/south-africa/mpumalanga/ogies-189664/,19/05/2019) (Table 9).

Table 9: Annual average temperature at Ogies (https://en.climate-data.org/africa/south-africa/mpumalanga/ogies 189664/, 19/05/2019)

Temperature (°C)	January		February	March	April	May	June	July	August	September	October	November	December	Total
Average	20.1		19.7	18.4	15.5	12.1	8.9	8.9	11.6	15.3	17.8	18.6	19.7	**15.6**
Minimum	13.7		13.4	11.7	8.1	3.7	0	0	2.5	6.7	10.2	11.9	13.2	**7.9**
Maximum	26.6		26.1	25.2	22.9	20.5	17.8	17.9	20.8	23.9	25.4	25.4	26.3	**23.2**

8.1.3 Wind Field

To assess wind conditions, site-specific modelled MM5 meteorological data was obtained from Lakes Environmental Software for the period January 2016 to December 2018. The data coverage was centred over the adjacent Klipspruit Colliery discard facility (approximately 1 km south of New Largo's MRA) (anemometer height of 14 m) with a grid cell dimension of 12 km x 12 km over a 50 km x 50 km domain. Due to the very close proximity, the experienced meteorological conditions are anticipated to be almost identical to that experienced on site at New Largo. The percentage recovery for parameters recorded was 100% and is thus considered reliable for use in this assessment. The wind conditions for the site using the modelled MM5 data is discussed below.

Winds at New Largo are predominantly from the northern and south-easterly sectors (Figure 15). Wind speeds are moderate, averaging ±3 to 5 m/s with a low percentage (±13%) of calm conditions (<1 m/s).

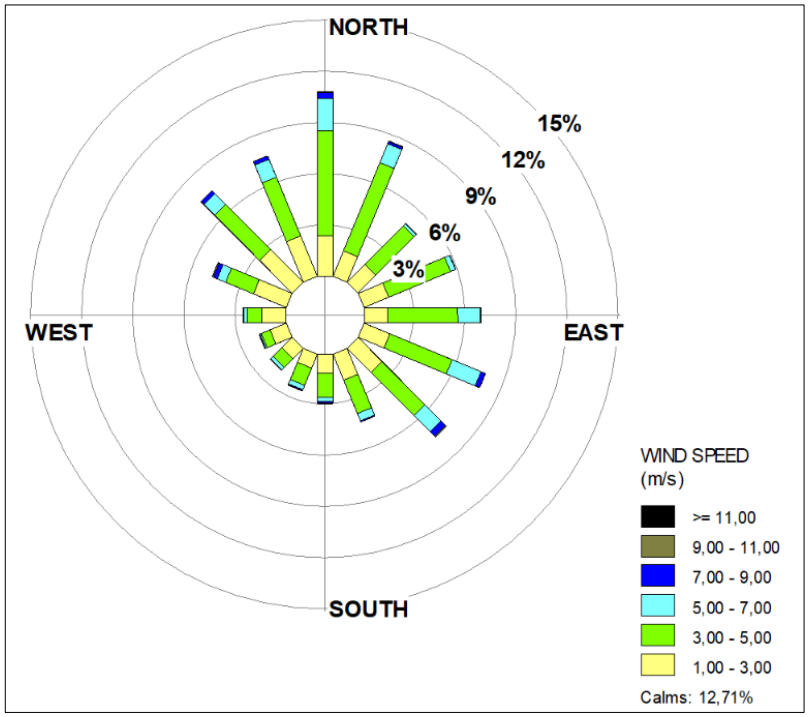

Figure 15: Modelled annual wind rose for New Largo (2016-2018)

8.2 Topography

The general topography is characterised by gently rolling terrain with no steep inclines. The elevation of the topography in the area ranges from 1 654 mamsl to 1 349 mamsl.

8.3 Land Cover

Figure 16 shows the 2018 land cover classification for the entire New Largo MRA, while Figure 17 shows the land cover classification specifically associated with Pits D and Pits H.

It is evident that the majority of land within and surrounding the MRA is classified as ‘cultivated land’, with mines and quarries also abundant (Figure 16). Non-developed land cover classes, such as ‘forested land’, ‘grassland’, ‘wetlands/waterbodies’ are present in the landscape, however, these are generally confined to small, localised portions. This land cover pattern, represented by a prevalence of modified habitats and only small and spatially discrete areas of natural habitat, is largely mirrored at a local scale at Pit D and Pit H (Figure 17).

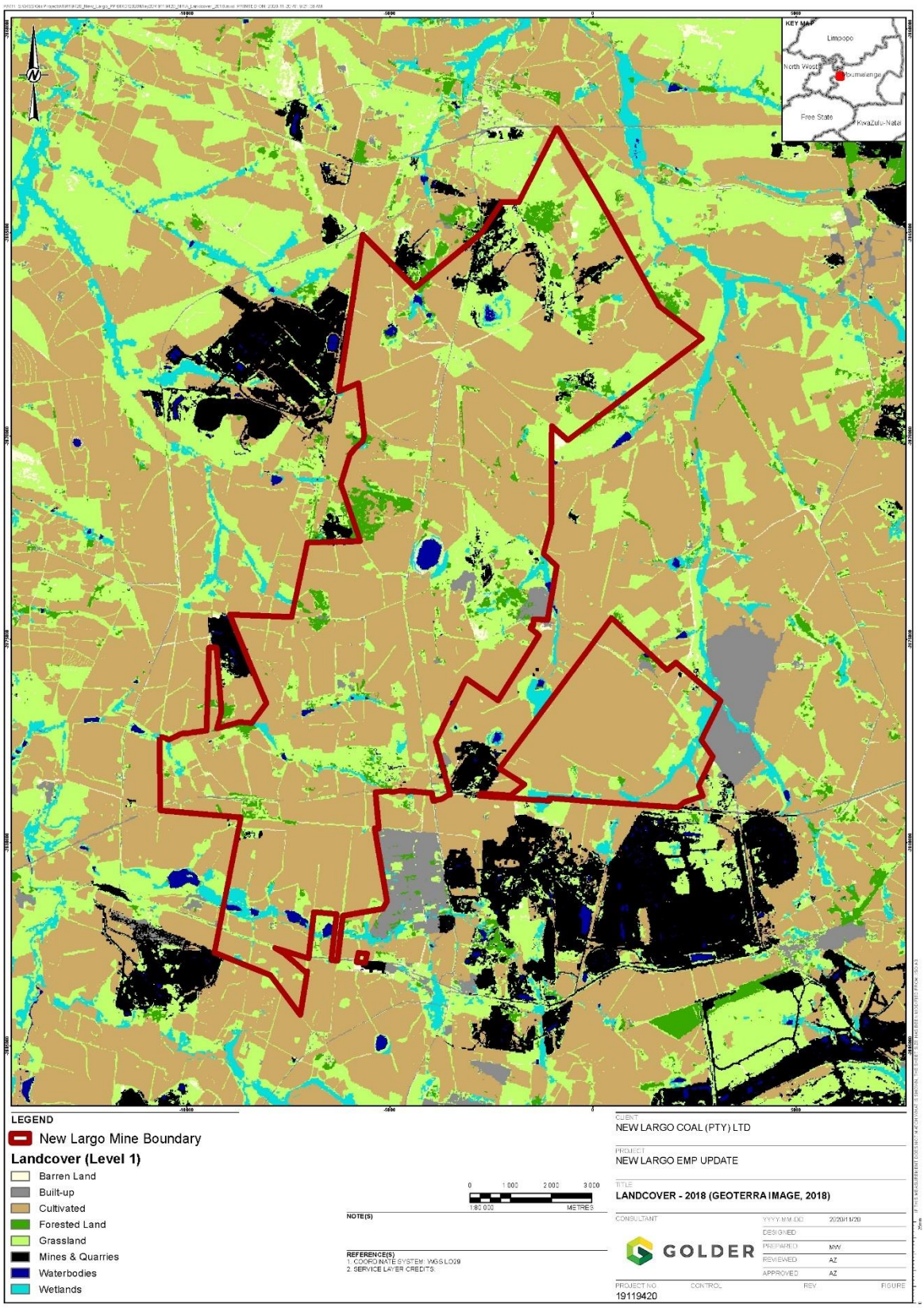

Figure 16: Land cover of the entire New Largo mining rights area (GeoTerra Image, 2018)

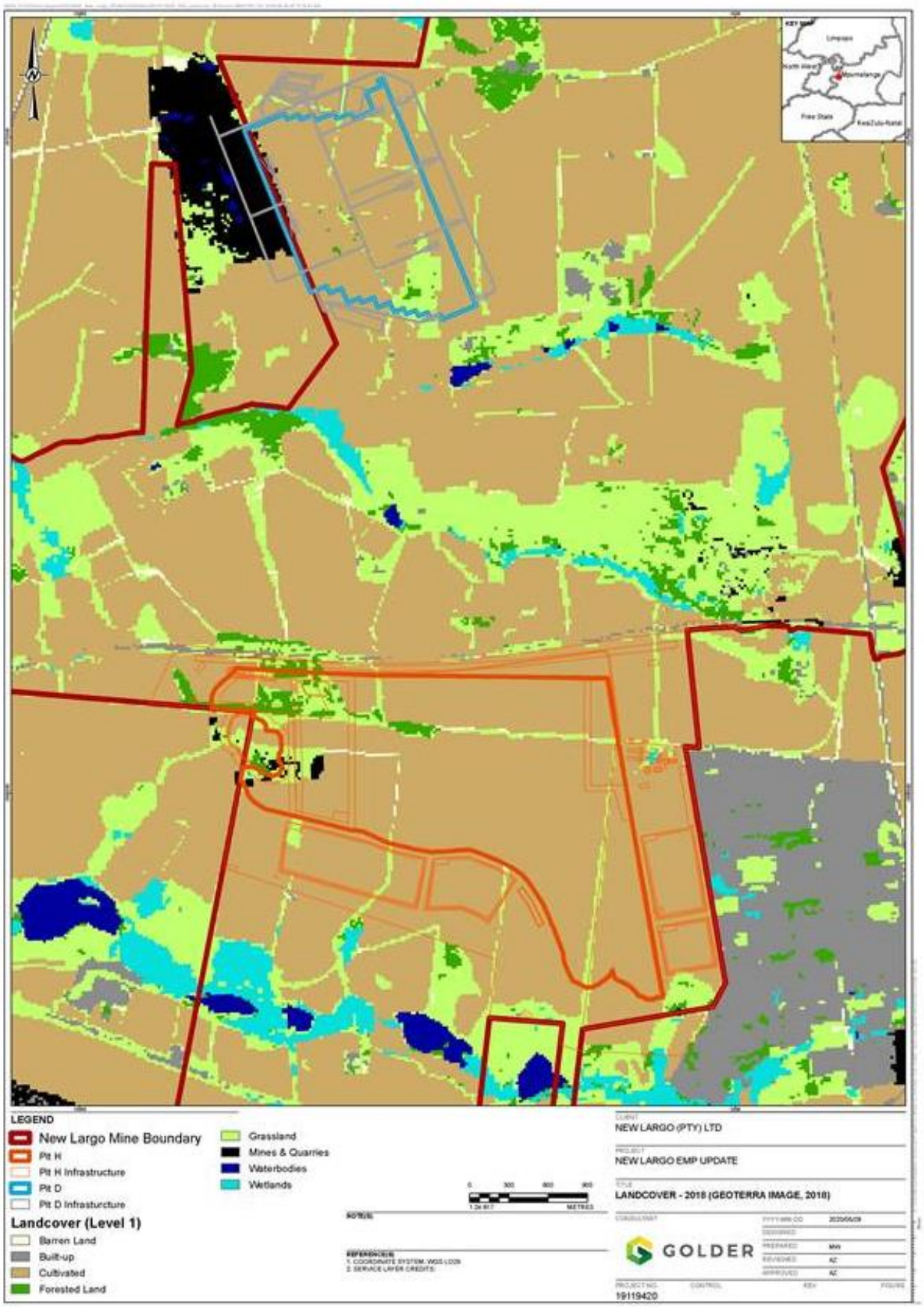

Figure 17: Land cover associated with Pit H and Pit D (GeoTerra Image, 2018)

8.4 Soils

A baseline soil study was conducted in 2006 (SES, 2006) and an impact assessment study was further undertaken in 2012 (SES, 2012) (Appendix C), with an update conducted in 2020 (Appendix E). The 2020 study included reconnaissance soil and land use surveys to inform the re-evaluation of the impact assessment on the soil and land capability of Pit H and Pit D. The following sections characterise the soils differentiating between 2006, 2012 and 2020.

8.4.1 Soil Forms

The majority of soil forms encountered in the study area are of the orthic phase, include Hutton and Clovelly. Some hydromorphic soil forms were also identified, including the Longlands as shown on Figure 18 (SES, 2006).

8.4.2 Physical Characteristics

The physical characteristics of the soil encountered include (SES, 2012):

- Topsoil clay percentages that range from 12% 25% depending on the host geology from which they are derived.
- Subsoil clays that range from 18% to greater than 45%
- Moderate to good in-situ permeability rates (0.74 to 2.15m/day)
- Moderate to good intake (infiltration) rates of 5 to 12 mm/hr
- Moderate (80 to 120 mm/m) water holding capacities.

The major soil types that exhibit moderate structure and which were encountered within the study area are associated with the more highly hydromorphic soil forms and colluvial soils associated with the low lying areas in and around the drainage lines and wetland environments (SES, 2012).

8.4.3 Chemical Characteristics

In general, the chemical analysis returned results typical for soils derived from sedimentary parent materials (SES, 2012). A sample was taken from the soils derived from the more basic parent materials, from the two major pans, and from the areas bordering the wetlands (Transition Zone). The results of the analysis indicate the following general trends:

- A pH range of between 3.70 and 6.55 (slightly acid) for the range of soils within the site
- Calcium, phosphorous and potassium levels are average to slightly higher than average
- Sodium, zinc and magnesium values are generally moderate to slightly low
- The organic carbon matter content varies from 0.19% to 4.23% C but is generally low (<0.75% C).

The study area has been affected by the commercial farming that has been practiced for many years on significantly large portions of the study area. It is likely that these activities will have impacted on the soil chemistry and to a limited extent on the landforms that have developed.

8.4.4 Soil Reconnaissance Survey

A reconnaissance survey (1 observation point per 100 ha) was conducted in June 2020, to confirm the findings of the baseline study in 2006, specifically for Pit H and Pit D.

8.4.4.1 Pit H

A total of six (6) auger holes were drilled up to 120 cm or refusal at the footprint of Pit H to assess the physical properties of the soil against the baseline conditions. A summary of field descriptions from each auger hole is presented in Table 10. The dominant soil forms were Hutton (716 ha of the infrastructure footprint) and Clovelly (75 ha of the infrastructure footprint) found within the mid slope and upper foot slope terrain units. The area covered by Hutton and Clovelly soil forms were mostly cultivated.

The remaining areas were covered by Westleigh (33 ha of the infrastructure footprint) and shallow Hutton soil forms (39 ha of the infrastructure footprint). The Westleigh soil form was observed to be moist and becoming saturated with depth. The shallow Hutton soil form was characterised by weathered sandstone at shallow depth of <45 cm. Areas covered by Westleigh and shallow Hutton soil forms were on undisturbed grassland.

Table 10: Physical properties and soil forms at Pit H

Soil Map Unit	Dominant Soil form	Texture	Effective soil depth (cm)	Summarised descriptions	Area (%)*
Pit H					
sHu	Shallow Hutton	Sand (Sa)	20	Dark brown (10YR 4/6) fine sandy orthic A on yellow red (5YR 5/6) coarse sand on highly weathered sandstone observed at 45 cm below ground level found on upper mid slope terrain units. **Observation ID – RP5**	39
Cv	Clovelly	Sand (Sa)	32	Yellow brown (2.5YR 4/2) fine sandy orthic A with small quartz stones (20 - 30%) on red (2.5YR5/8) fine sandy apedal B observed up to 120 cm below ground level found on mid slope and foot slope terrain units. **Observation ID – RP4**	75
Hu	Hutton	Sand (Sa)	50	Dusky red (2.5YR3/2) fine sandy orthic A on red (2.5YR4/8) fine sandy red apedal B observed up to 120 cm below ground level on mid slope and foot slope terrain units. **Observation ID – PD1A, RP10 & RP11**	716
We	Westleigh	sandy clay (SaCl)	30	Brown (10YR4/3) fine sandy orthic A that is compacted on surface on yellow brown (10YR5/8) fine sandy clay soft plinthic horizon with red large soft mottles observed up to 120 cm on lower foot slope terrain unit. **Observation ID – RP9**	33
Shaft	Old shaft area			Old shaft area where the ground has subsided in certain areas	11

Note: * Approximate areas where infrastructure and the pit area will be located.

8.4.4.2 Pit D

A total of five (5) auger holes were drilled up to 120 cm or refusal along areas of proposed infrastructure at Pit D to assess the physical properties of the soil against the baseline conditions. The dominant soil forms were Hutton (194 ha of the infrastructure) and Mispah soils forms (110 ha of the infrastructure) as shown on Figure 19. Cultivated areas were on Hutton soil form whilst natural grassland was on Mispah soil form characterised by shallow bedrock (sandstone). **Although Mispah soil form was not delineated in the 2007 baseline study, the soil form could be susceptible to erosion due to a high index of erosion of 1.45** which is a product of the erodibility factor and slope percentage as determined by Wischmeier et al. (1971). The erosion factor is determined from the soil texture, permeability and organic matter content and soil structure (Wischmeier et al., 1971). A summary of field descriptions from each auger holes are presented in Table 11.

Table 11: Physical properties and soil forms at Pit D

Soil Map Unit	Dominant Soil form	Texture	Effective soil depth (cm)	Summarised descriptions	Area (%)*
Pit D					
Ms	Mispah	Sand (Sa)	15	Brown (7.5YR5/3) fine sandy orthic A with small quartz stone on highly weathered sandstone observed from 15 cm below ground level on upper mid slope to crest positions. **Observation ID – PD1& PD3**	110
Hu	Hutton	Loamy sand (LmSa)	43	Dusky red (2.5YR3/2) fine loamy sand orthic A with severe sealing on surface and slight crusting. A red (2.5YR4/8) fine loamy sand apedal B with 10-15% quartz stones was observed under the orthic A up to 120 cm below ground level on mid slope to upper foot slope terrain units. **Observation ID – PD2 &PD2A &PD3A**	194

Note: * Approximate areas where infrastructure and the pit area will be located.

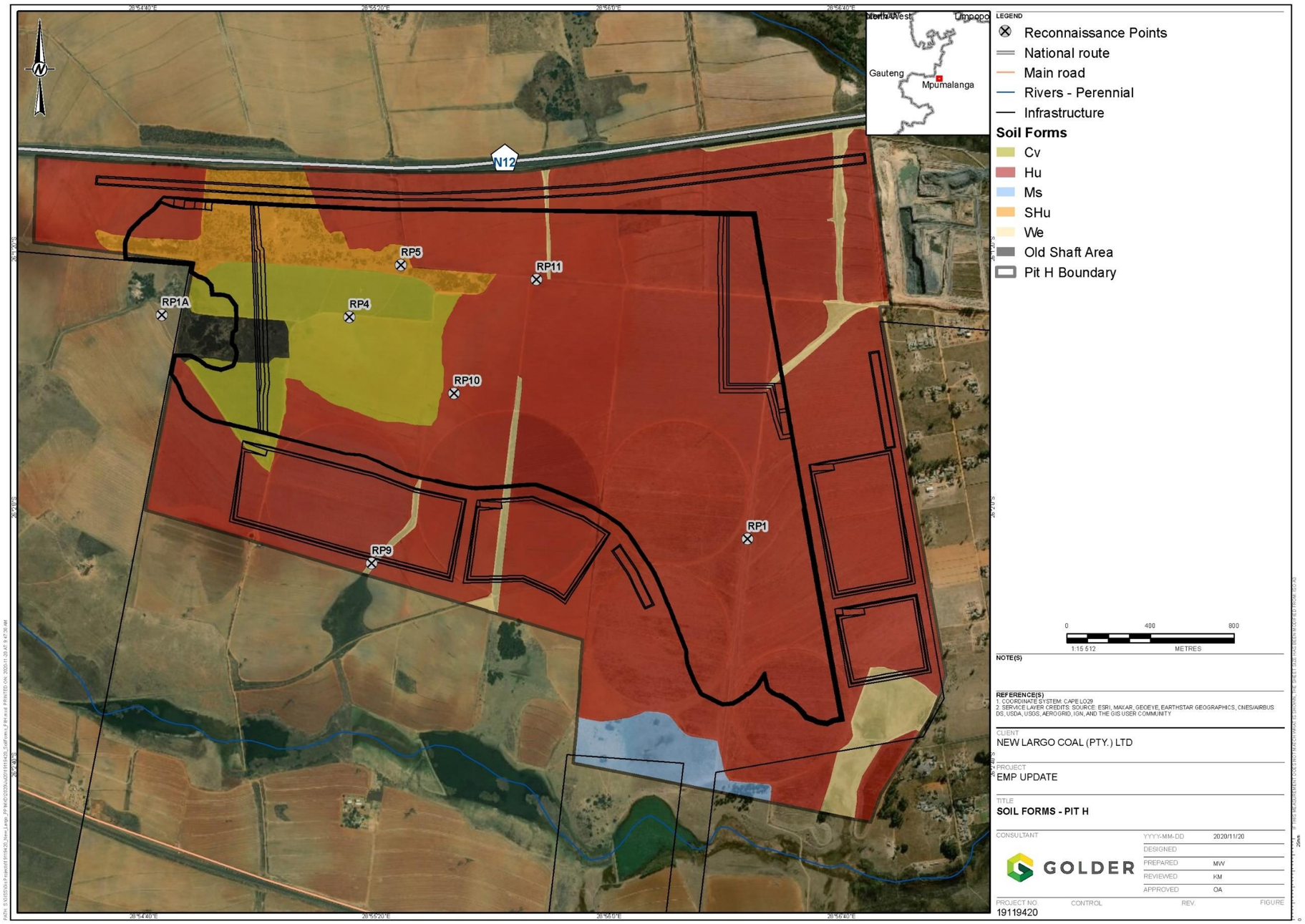

Figure 18: Map showing the spatial distribution of soil forms identified at Pit H

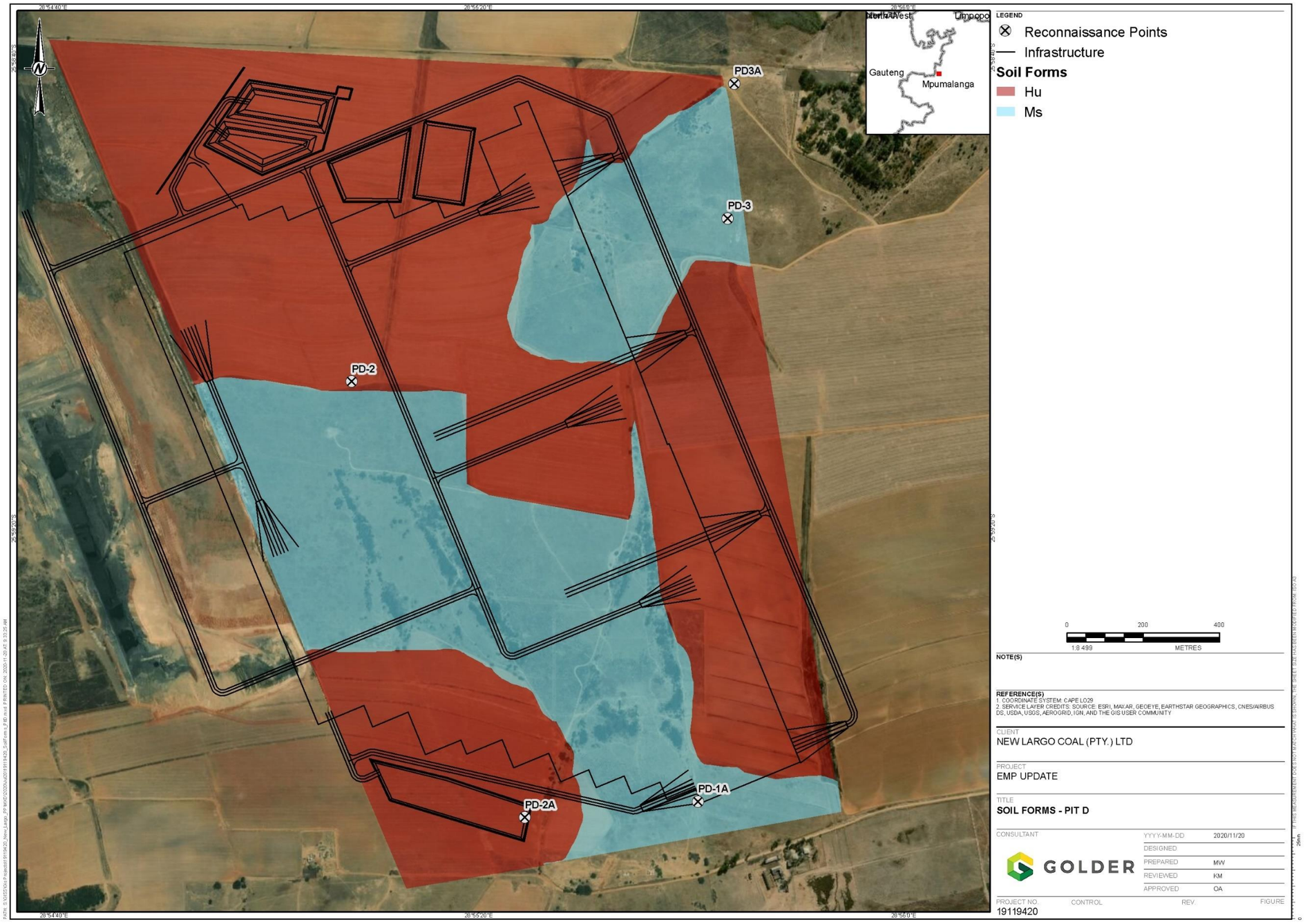

Figure 19: Map showing the spatial distribution of soil forms identified at Pit D

8.4.5 Land Capability

The soil specialist studies conducted by SES in 2006 and 2012 indicated the dominant land capability as arable or grazing land with the remaining areas classified as wilderness comprising of natural bush, grasslands and wetlands (SES, 2012).

Since soils were not collected for laboratory analyses, the land capability of the proposed footprint was assessed in accordance with the Chamber of Mines of South Africa guidelines for the Rehabilitation of Mined Land, 2006 as shown in Table 12.

Table 12: Pre-mining land capability requirements (Chamber of Mines, 1981)

Criterion	Descriptions
Wetlands	■ Land with organic soils or ■ A horizon that is gleyed throughout more than 50% of its volume and is significantly thick, occurring within 750 mm of the surface
Arable land	■ Land, which does not qualify as a wetland ■ The soil is readily permeable to the roots of common cultivated plants to a depth of 750 mm ■ The soil has a pH value of 4.0 and 8.4 ■ The soil has a low salinity and SAR ■ The soil has a permeability of at least 1.5 mm per hour in the upper 500 mm of the soil ■ The soil has less than 10% (by volume) rocks or pedocrete fragments larger than 100 mm in diameter in the upper 750 mm ■ Has a slope (%) and erobility factor (k) such that their product is<2.0 ■ Occurs under a climatic regime which facilitates crop yields that are at least equal to the current national average for these crops, or is currently being irrigated successfully
Grazing land	■ Land, which does not qualify as wetland or arable land ■ Has soil, or soil-like material, permeable to roots of native plants, that is more than 250 mm thick and contains less than 50% by volume of rocks or pedocrete fragments lager than 100 mm ■ Supports, or is capable of supporting, a stand of native or introduced grass species, or other forage plants, utilizable by domesticated livestock or game animals on a commercial basis
Wilderness land	■ Land which does not qualify as wetland, arable land or grazing land.

Although the land capability of Pit H was conducted at a larger scale, Golder increased the resolution of mapping to gain an understanding of the land capability at Pit H and Pit D. The land capability of Pit H comprise of the following, as shown on Figure 20:

- Arable land (807 ha);
- Grazing land (40 ha);
- Wetland (32 ha); and

- Wilderness (32 ha).

The land capability of Pit D comprises of the following as shown on Figure 21:

- Arable (111 ha); and
- Grazing land (194 ha).

8.4.6 Land Use

The pre-mining land-use at Pit H area was rain-fed (dry land) cultivation of maize fields, wilderness and majority being irrigated land (i.e. centre pivot irrigation system). The findings of the site walkover conducted on 11 June 2020 indicated similar pre-mining land use to that observed in 2006. The infrastructure area of Pit D comprised of bean plantations and undisturbed grassland.

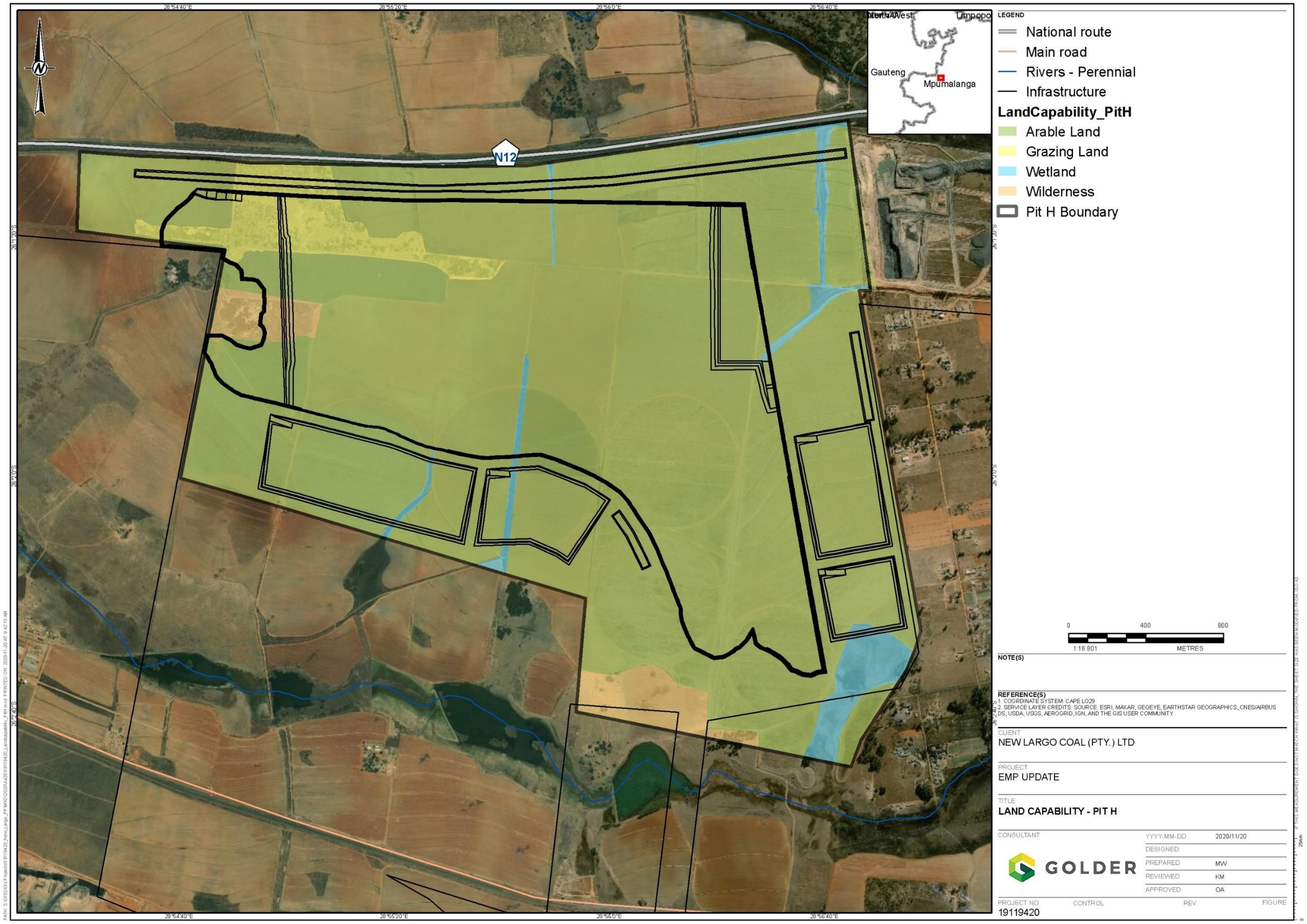

Figure 20: Map showing the land capability of Pit H

Figure 21: Map showing the land capability of Pit D

8.5 Ambient Air Quality

An air quality study was undertaken in 2012 by Airshed Planning Professionals (Appendix C), with an update conducted in 2020 (Appendix E). The following sections characterise the ambient air quality at New Largo from 2012 and most recently now in 2020.

The New Largo and the surrounding areas fall within the Highveld Priority Area (HPA) and are therefore subject to its AQMP (DEA, 2015). The HPA AQMP was established to help alleviate the large amounts of air pollution that the region was experiencing. Exceedances of particulate matter (PM_{10}), sulphur dioxide (SO_2), nitrogen dioxide (NO_2) and ozone (O_3) have often been recorded in the pollution hotspots of the eMalahleni, Kriel, Steve Tshwete, Ermelo, Secunda, Ekurhuleni, Lekwa, Balfour and Delmas areas (DEA, 2015).

8.5.1 Local Sources of Emissions

There have been significant changes in the emission sources within the project area since the original 2012 EIA. Potential sources of air pollution within vicinity of the New Largo include:

- Agricultural activities;
- Biomass burning;
- Domestic fuel burning;
- Mining activities (including New Largo's existing operations);
- Vehicle emissions (tailpipe and entrained emissions);
- Paved roads;
- Unpaved roads; and
- Power generation.

8.5.2 Sensitive Receptors

In 2012, the air quality sensitive receptors identified by Airshed Planning Professionals (Pty) Limited included the residential areas of Wilge, Kendal Forest Holdings, Phola and Ogies. Other sensitive receptors in the region (i.e. in excess of 20km away) included the residential areas of Botleng and Delmas to the west-south-west, Clewer, Vosman, KwaGuqa, Hlalanikahle to the east-north-east and Bronkhorstspruit to the north-west (Airshed, 2012).

The distribution of sensitive receptors within the local area have remained relatively unchanged since 2012 other than natural expansion and growth of the residential areas over time. Most of the individual farm residences remain throughout the MRA; and the only "new" significant sensitive receptor identified is the informal settlement behind Vlakfontein mine and adjacent to the R545. This community originated from the old farm workers accommodations pre 2012 and has subsequently become an informal settlement over the last eight years

Under the current 2020 requirements regarding air quality impact assessments, receptors were identified within two radius ranges, namely 10 km and 50 km from the project footprint; and defined as areas where occupants are more susceptible to the adverse effects of exposure to pollutants. These areas include but are not limited to:

- Residential areas;
- Hospitals/clinics;
- Schools and day care facilities; and

- Elderly housing.

Sensitive receptors within a 10 km radius of New Largo were identified and are presented in Figure 22 regional sensitive receptors within a 50 km radius of New Largo are shown on Figure 23.

New Largo Ambient Air Quality Monitoring

8.5.2.1 Dust Fallout Monitoring

Dust fallout monitoring was conducted during the period of September 2019 to February 2020 (Figure 24).The monitoring was undertaken in both residential and non-residential areas using single bucket samplers. Figure 25 and Figure 26 provides the dust-fallout trend for the residential (Wilge Post Office, NL05, NL06, NL07 and NL08) and non-residential (NL01, NL02, NL03, NL04, Kusile and Malachite) monitoring sites.

Multiple exceedances of the NEM: AQA Residential Dust Fallout Regulation Limit (600 mg/m^2/day) were experienced at all residential monitoring sites except for at the Wilge Post Office (i.e. exceedances in terms of frequency, sequential months and/or both). No exceedances of the NEM: AQA Non-Residential Dust Fallout Regulation Limit (1200 mg/m^2/day) were experienced at all non-residential monitoring sites. Based on the monitoring data, it appears that there are elevated dust fallout levels within the nearby local communities (i.e. elevated baseline conditions).

Note: Dust fallout monitoring data from the original EIA is available but this data is more than 11 years old and holds no validity against the current site conditions and has thus been excluded.

8.5.2.2 PM_{10} Particulate Monitoring

New Largo does not undertake any PM_{10} monitoring onsite.

Note: PM_{10} monitoring data from the original EIA is available for Eskom monitoring stations but this data if more than 8 years old and holds no validity against the current site conditions and has thus been excluded.

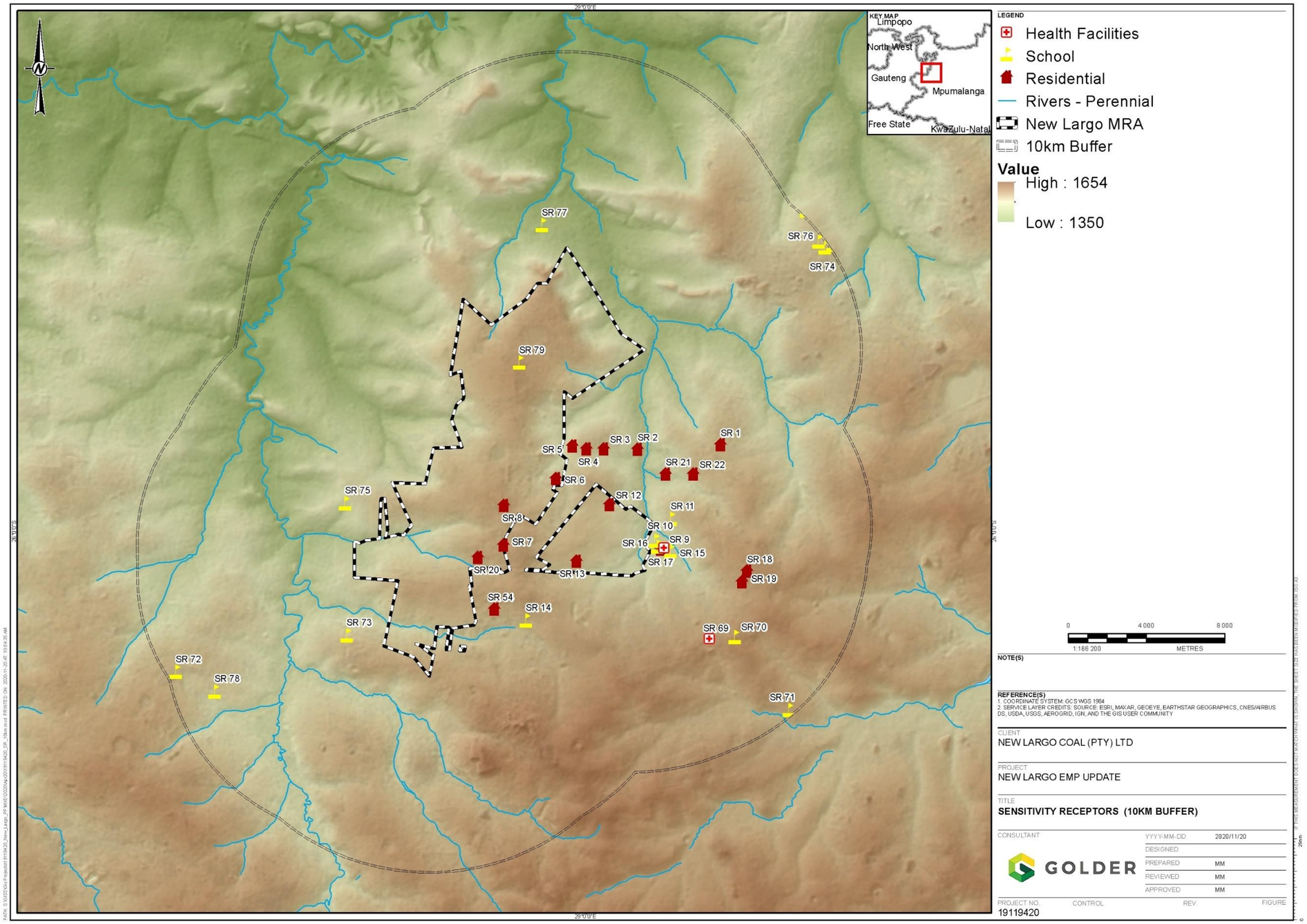

Figure 22: Local topography and sensitive receptors (10 km radius)

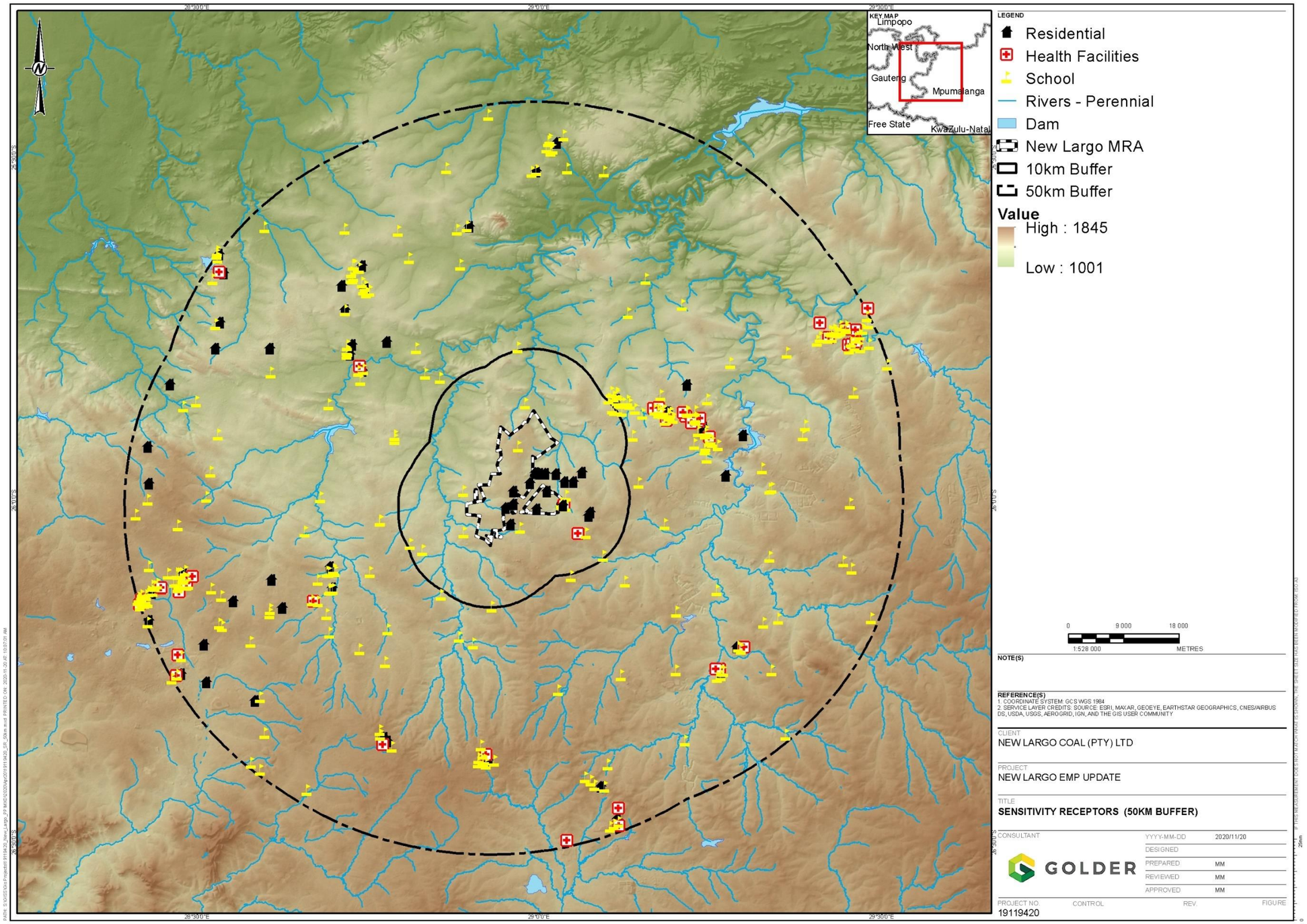

Figure 23: Regional topography and sensitive receptors (50 km radius)

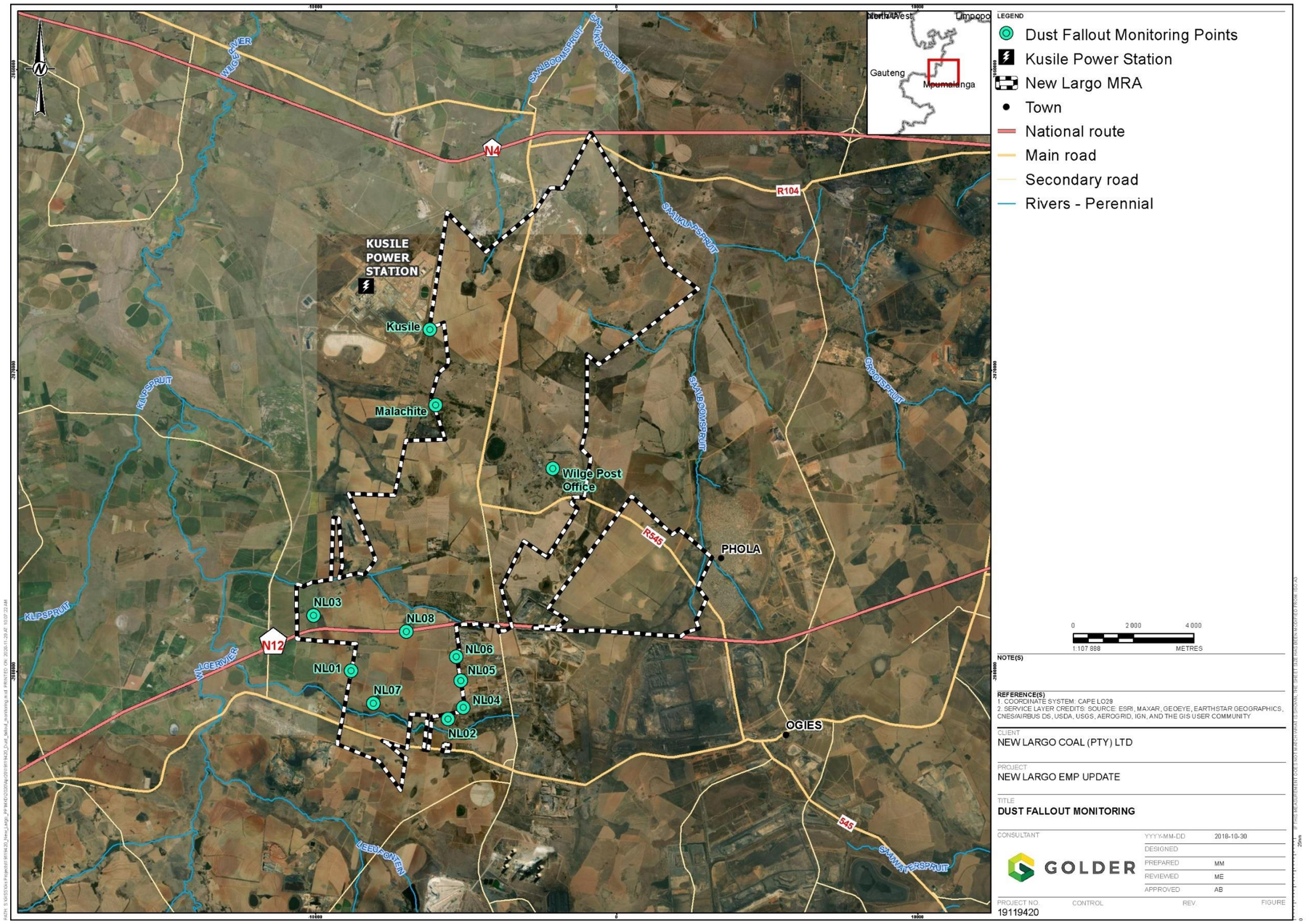

Figure 24: New Largo dust fallout monitoring locations for September 2019 to February 2020

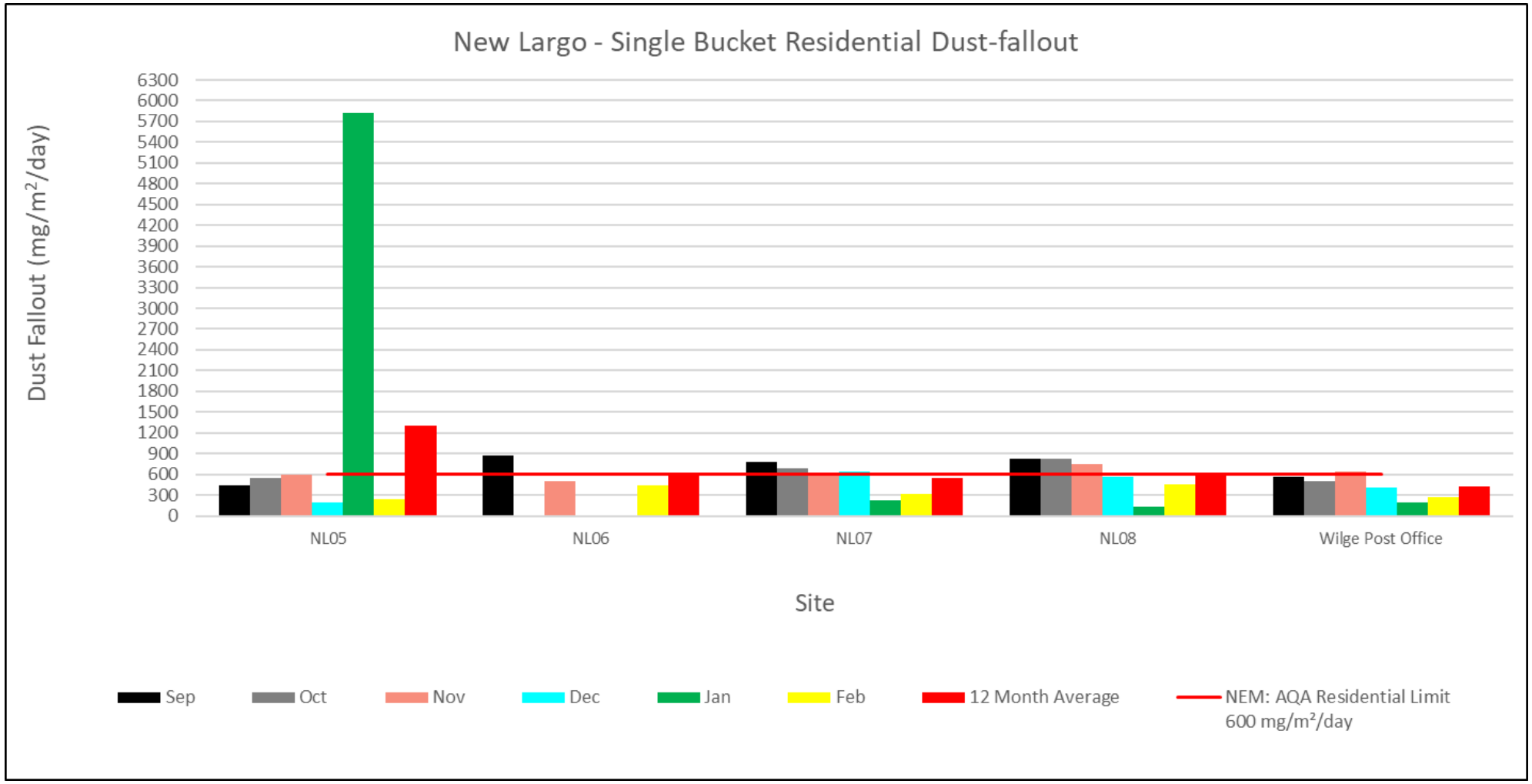

Figure 25: Residential dust fallout results for September 2019 to February 2020

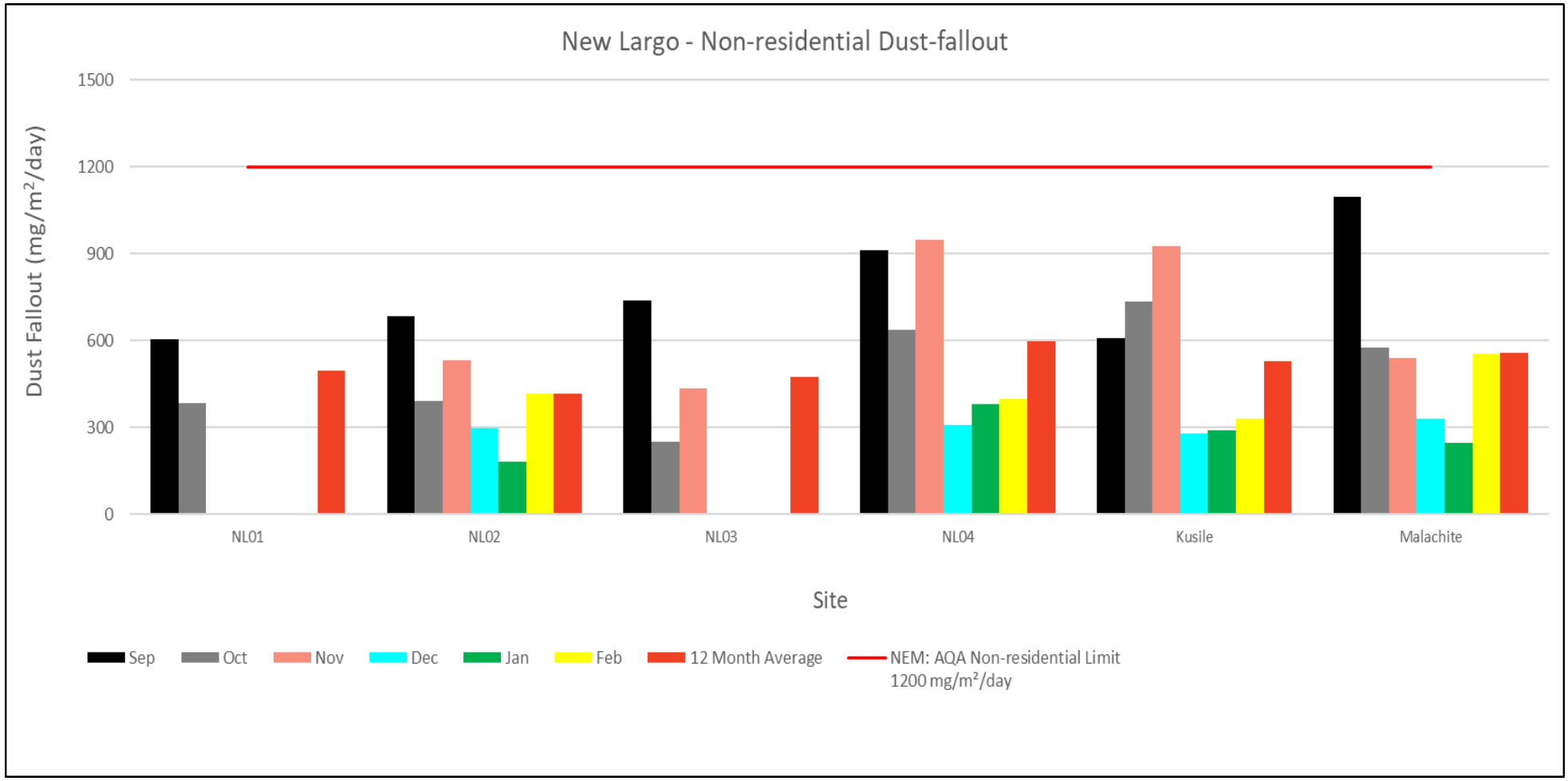

Figure 26: Non-residential dust fallout results for September 2019 to February 2020

8.6 Traffic

A traffic impact assessment study for the proposed R545 relocation was conducted in 2012 (WSP, 2012) (Appendix C). A new traffic study was undertaken in July 2020 (Appendix E) to assess the impact of the implementation of changes to the mining sequence and additional supporting infrastructure for New Largo (Pit D and Pit H), where coal will be hauled between these mini pit operations and the nearby Kusile and Kendal Power Stations (the full report is presented in Appendix E). The below sections summarise the baseline traffic situation in the study area.

8.6.1 Traffic Surveys

Manual traffic surveys were done during a 12-hour period (06:00 – 18:00) on 30 July 2020 on six homogenous road sections (Figure 27) and were chosen for capacity and operational analyses, namely:

- Section AI – R545 from the intersection with R686 in the north (A) to the interchange with the N12 in the south (I);
- Section AB – R686 from the intersection with R545 (A) to the main access to the Kusile Power Station (B);
- Section BC – R686 from the main access to the Kusile Power Station (B) to the interchange with the N12 (C);
- Section IF – D686 from the interchange with the N12 (I) to the intersection with R555 (F);
- Section FG – D686 from the intersection with R555 (F) to the intersection with D683 (G); and
- Section GH – D683 from the intersection with D686 (G) to the access to the Kendal stockyard (H).

The current weekday AM Peak Hour occurred between 6:15 and 7:15, and the weekday PM Peak Hour between 15:45 and 16:45.

Figure 27: Road network sections and cross-sections (TechWorld, 2020)

Historical traffic information was also obtained and compared with the recent traffic counts. A good correlation was obtained between the historical and the more recent traffic counts. The existing traffic characteristics are summarised in Table 13.

Table 13: Existing 2020 traffic characteristics

Section	Direction	Total daily traffic and %HV A	Total peak hour volume AM /PM	% HV AM / PM	PHF AM / PM
Section AI: R545 (N/S)	Northbound Southbound	±4,850 ±19%	115 / 244 502 / 93	10% / 12%	0.73 / 0.75
Section AB: Lone Rock Rd (R686)	Westbound Eastbound	±3,550 ±11%	461 / 60 91 / 136	2% / 16%	0.82 / 0.68
Section BC: Lone Rock Rd (R686)	Northbound Southbound	±1,900 ±13%	165 / 69 48 / 70	6% / 20%	0.85 / 0.94
Section IF: D686	Northbound Southbound	±7,450 ±30%	227 / 527 481 / 164	13% / 24%	0.86 / 0.90
Section FG: D686	Northbound Southbound	±3,000 ±37%	54 / 226 180 / 47	16% / 31%	0.73 / 0.63
Section GH: D683	Westbound Eastbound	±2,500 ±42%	39 / 195 136 / 35	19% / 33%	0.71 / 0.61

Table 13 shows the following:

- The daily traffic flow varies between 1 900 and 7 450 vehicles per day;
- Section IF (D686) has the highest daily flow of 7 450 vehicles compared with Section BC (D960) that has the lowest daily flow of 1 900 vehicles;
- Section GH has the highest percentage heavy vehicles of 42% on a daily basis compared with Section AB that has the lowest percentage heavy vehicles of 11% on a daily basis;
- The highest percentage heavy vehicles during the peak hours occur during the afternoon namely 33% on Section GH, 31% on Section FG, and 24% on Section IF. The percentage heavy vehicles is higher during the PM peak hour compared with the AM peak hour;
- The one-directional peak hour flows vary between 39 and 502 vehicles during the AM peak hour and between 35 and 527 vehicles during the PM peak hour; and
- The peak hour factors vary between 0.71 and 0.86 during the AM peak hour and between 0.61 and 0.94 during the PM peak hour.

8.7 Noise

A noise study was undertaken by Acusolvs in 2012 (Appendix C), with an updated baseline description and impact assessment conducted in 2020 (Appendix E). The following sections characterise the ambient noise at New Largo from 2012 and most recently now in 2020.

8.7.1 Existing Noise Sources

Existing noise sources identified within 10 km radius of the New Largo MRA include:

- **Roads**: The main roads influencing the local noise baseline in close proximity to the mine include:
  - National roads:
    - N4: Aligned in a west-east direction directly adjacent to the northern boundary of the MRA. The surfaced road links Bronkhorstspruit to eMalahleni; and
    - N12: Aligned in a west-south-west to east-north-east direction directly and traverses through the southern section of the MRA. The surfaced road links Benoni via Delmas to eMalahleni.
  - Regional road:
    - R555: It is aligned in a west-east direction and traverses through the southern section of the MRA approximately 1.5 km south of Pit H. The surfaced road links Delmas via Kendal to Ogies;
    - R545: It is aligned north-south and west-east direction and traverses through the northern, central, eastern southern section of the MRA and through Pit F. The surfaced road links Balmoral to Ogies
    - R686: It is aligned north-south direction approximately 1-3 km from the western boundary of the MRA. The surfaced road links the N12 to N4 via the R104 to Balmoral; and
    - R104: It is aligned north-south direction approximately 700 m north of the northern boundary of the MRA and links R686 to the N4 to Balmoral.
  - An extensive network of gravel access roads to the individual farmlands and crop fields surround and intersect the boundary of the proposed shaft complex footprint.
- **Mining activities**: The closest mining source of noise influencing the local noise baseline is that of the Klipfontein colliery situated adjacent to Pit D. Within a 10 km radius of the MRA additional mining noise sources include: Klipspruit Colliery, Zibulo Colliery, Mbali Colliery, Goedgevonden Mine, Khutala Colliery and Wescoal Khanyisa Colliery, etc.
- **Power generation activities**: The Kusile Power Station is located adjacent to the north-western boundary of the northern section of the MRA and the Kendal Power Station is located approximately 4.5 km south-east of the southern section of the MRA and Pit H. Noise from these two power stations, including coal handling, ash disposal and soot blowing activities, may influence the noise baseline on site.
- **Railway activities**: The railways influencing the local noise baseline in close proximity to the MRA include:
  - Railway aligned in a west-east direction, directly adjacent to the R555 and traverses through the southern section of the MRA approximately 1.5 km south of Pit H. The railway links Delmas via Kendal to Ogies; and
  - Railway aligned in a north-west to south-east direction just north of Balmoral and the northern boundary of the MRA. The railway links Bronkhorstspruit via Balmoral to Clewer.
- **Industrial activities**: The closest industrial sources of noise influencing the local noise baseline is that of the Phola Coal Processing Plant approximately 7 km east of Pit H and 3 km south of Pit F, and Pride Milling located in Ogies approximately 9.5 km away.
- **Other sources**: Other land use noise sources include:
  - Agricultural activities including commercial crop and cattle farming, small scale subsistence farming activities;

- Residential areas including Ogies, Wilge, Phola, informal residential areas in the local towns (e.g. northern and eastern edge of Phola and southern edge of Ogies etc.) and individual farm residences and/or small holdings within the MRA; and
- Recreational activities.

- **Natural environmental noise**: Natural environmental noise is also identified as a contribution source to the baseline noise levels including noise generated by local fauna during the day and night time (i.e. bird calls and other animal communications) and wind whistling through the grass and/or rustling of tree and shrub leaves.

8.7.2 Change in Noise Sources

No significant changes have been observed in the land use noise sources within a 10 km radius of the MRA between 2012 and 2020. Nominal expansion of the power generation, residential areas and individual mining and/or industrial activities is observed.

8.7.3 Sensitive Receptors

Noise impacts are typically experienced at relatively close proximity to the emitting source. The noise sensitive receptors are considered by SANS 10328:2008 to include residential dwellings, and institutional and culturally important sites, such as schools, hospitals and places of worship.

Sensitive receptors within a 10 km radius of New Largo were identified by Acusolvs in 2012 (Appendix C), and include 17 residential receptors, two clinics, and 15 schools. The current (2020) distribution of sensitive receptors within the local area have remained relatively unchanged since 2012 other than natural expansion and growth of the residential areas over time. Most of the individual farm residences remain throughout the MRA; and the only “new” significant sensitive receptor identified is the informal settlement behind Vlakfontein mine and adjacent to the R545. This community originated from the old farm workers accommodations pre 2012 and has subsequently become an informal settlement over the last eight years.

8.7.4 Noise Monitoring

No additional current baseline noise monitoring data is available within the MRA other than that undertaken in 2012 for the noise assessment conducted for the EIA. During the 2012 noise assessment, baseline noise monitoring was undertaken at seven monitoring locations within the MRA at a selection of sensitive receptors (Table 14; Figure 28). Daytime noise levels exceed the SANS 10103 “Suburban – With little road traffic” daytime limit of 50 dB(A) at all sites except M6 (V. d. Heever residence). Similarly, night-time noise levels exceed the SANS 10103 “Suburban – With little road traffic” night-time limit of 40 dB(A) at most sites except M1 (Rockblend premises) and M3 (Engelbrecht residence). The night-time noise levels at M1 and M3 are however very close to the standard (i.e. within 3 dB).

Table 14: Baseline noise monitoring location information (After Van Zyl, 2012)

Monitoring point	Name	Lattitude (S)	Longitude (E)	Daytime (dB)	Nighttime (dB)
M1	Premises Rockblend	25° 54’ 18.4’’	28° 58’ 27.2’’	55	37
M2	Residence Mac Donald	25° 57’ 09.9’’	28° 55’ 57.0’’	52	40
M3	Residence Engelbrecht	25° 59’ 51.0’’	28° 55’ 47.9’’	50	37
M4	Residence Cloete	25° 57’ 44.3’’	29° 1’ 24.7’’	52	43
M5	Residence Truter	25° 59’ 23.7’’	29° 0’ 43.6’’	54	48

Monitoring point	Name	Lattitude (S)	Longitude (E)	Daytime (dB)	Nighttime (dB)
M6	Residence V d Heever	25° 54' 00.0''	29° 4' 04.8''	49	41
M7 *	Area south of N12	26° 1' 42.2''	28° 57' 44.0''	54	46
Local average noise levels (dB)				**52**	**42**
Note:	■ * The monitoring point GPS location was estimated off Google Earth positioning relative to the MRA boundaries as is not listed in the 2012 noise study report; and ■ SANS 10103 "Suburban – With little road traffic" daytime limit 50 dBA and night-time 40 dBA; and ■ Exceedances of the limits are shaded in red.				

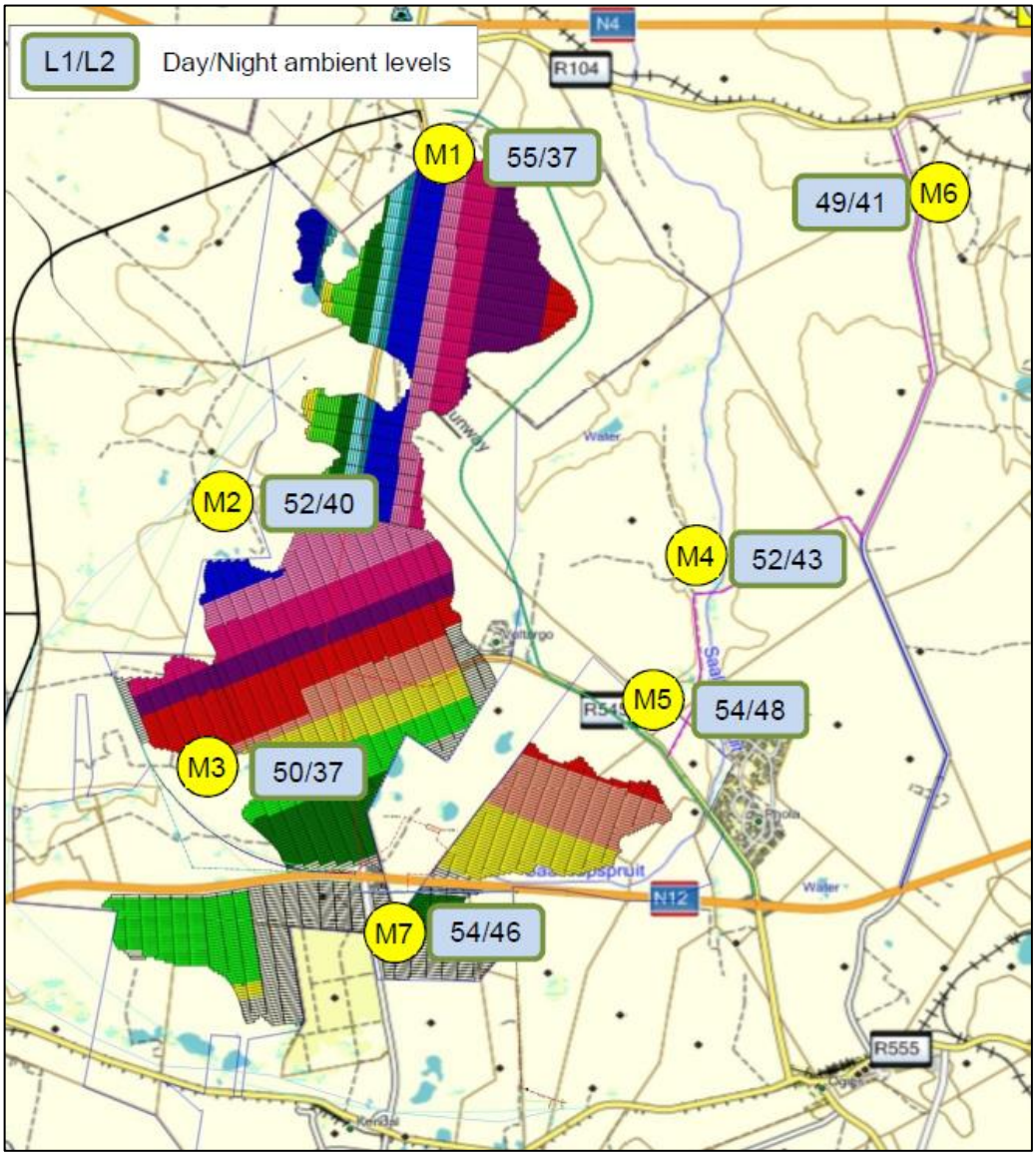

Figure 28: Noise monitoring locations

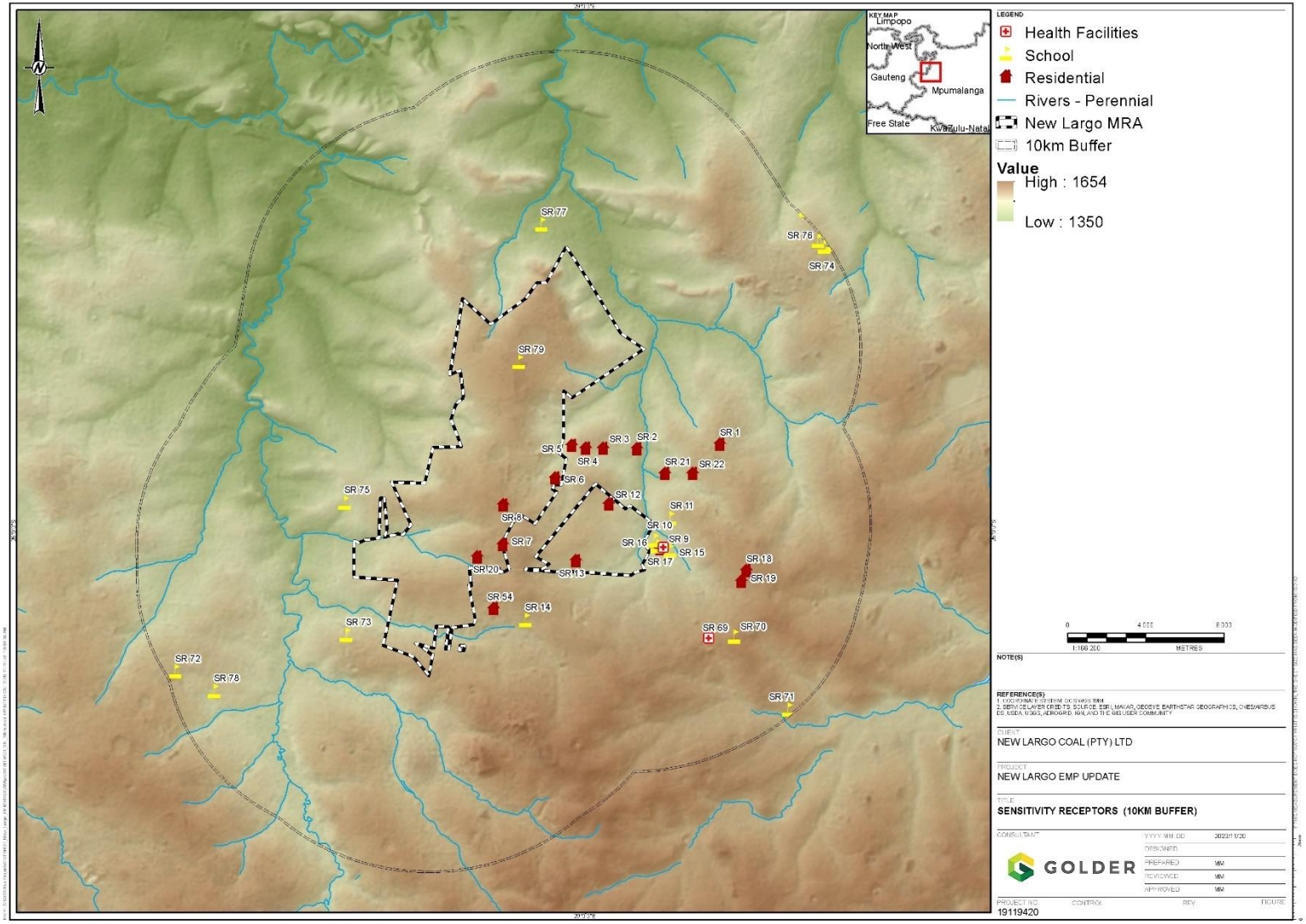

Figure 29: Local topography and sensitive receptors (10 km radius)

8.8 Groundwater

A specialist groundwater report for the integrated EIA and WUL application for the New Largo Coal Project was undertaken in 2012 by Jasper Muller and Associates (JMA) (Appendix C).

JMA (2012) found that there is extensive occurrence of groundwater over the entire New Largo area, with moderate potential yields available. Only isolated impacts on groundwater quality were found, linked to both underground coal mining and agricultural use. For the remaining areas the groundwater quality was considered good. Limited monitoring of groundwater quality has continued since then, and where available has been used to update the current baseline description. The updated baseline and assessment of the impact of the latest changes in the LOM plan on groundwater have been considered in an updated groundwater assessment report (see Appendix E).

8.8.1.1 Hydrogeological Units

JMA reported the presence of two dominant hydrogeological units intersected during the drilling of their investigation boreholes at New Largo, namely:

- A laterally extensive shallow weathered zone aquifer, and
- More localised deeper fractured aquifer systems

The more prominent of these is the laterally extensive shallow weathered zone aquifer, which occurs in the weathered and weathering related fractured zone within the Vryheid (Karoo Supergroup) and Pretoria Group (Transvaal Supergroup) lithologies (JMA, 2012). The average vertical thickness of this aquifer zone is approximately 21 m and it is considered to store and transport the bulk of groundwater, displaying unconfined to semi-confined piezometric conditions.

Although not considered a natural aquifer, significant volumes of water are stored in the mined out (1989) underground workings on the No.2 and No.4 coal seams of the old New Largo Colliery.

8.8.1.2 Borehole Yields

The JMA (2012) specialist groundwater report covers the entire proposed New Largo Colliery site and refers to 28 hydrogeological investigative boreholes that were drilled in 2006 at the New Largo site, intersecting the shallow weathered aquifer at an average depth of 30m below ground level. Borehole blow yields were obtained from 17 of these boreholes, while 11 boreholes were dry. The blow yields in the 17 wet boreholes varied between 0.01 L/s and 3.33 L/s, averaging at 0.23 L/s. According to the average borehole yield maps of the MRA (JMA, 2012 – Appendix C), the majority of the monitoring boreholes plot with the average borehole yields 0.1 – 0.5 l/s. The average tested borehole yields within the study area averages at 0.23 l/s and falling within the DWAF (2009) borehole yield range.

8.8.1.3 Aquifer Parameters

The average storativity (S) of the shallow weathered aquifer, formed by the interstices/pore space and fracturing of the weathered Karoo host rock below the water table is reported by JMA (2012) to be 0.002. The effective aquifer porosity in the weathered Karoo aquifer is reported as ranging between 0.01 and 0.07, with a bulk probable effective porosity of 0.05.

8.8.1.4 Groundwater Recharge

Groundwater recharge to the shallow aquifer zone at New Largo is as a function of rainfall and infiltration and is expressed as a percentage of mean annual rainfall (MAP), which is taken at 736 mm/annum for the New Largo area. The mean annual recharge to the groundwater system is estimated to between 3 and 7% of the MAP, or approximately 25 – 55mm per annum.

8.8.1.5 Groundwater Levels and Flow Direction

The depth to the natural groundwater level at New Largo is reported by JMA (2012) to vary between 2.14 to 19.86 mbgl. The groundwater elevations tend to mimic the ground elevation within the New Largo area.

Groundwater generally flows from high elevations towards the surface drainages. New Largo project area lies on a topographical high, with water draining to the east and west along the sub-catchment in the direction of the Saalklapspruit and Wilge River respectively. The sub-catchment boundary is inferred to behave as a groundwater divide.

The Pit H area has components of flow towards the north and south, separated by an east-west aligned catchment divide, in the northern half of the Pit H area. These separate components of flow, however, are part of an overall regional north-easterly flow trends towards the Wilge River.

Groundwater flow in the Pit D area flows from a point of high elevation near the centre of the proposed pit, radiating in the direction of the surface water drainage systems to the north and south of the pit.

8.8.1.6 Water Supply Borehole for Pit H

A potential water supply borehole within the Pit H vicinity is required for the Pit H operation. There are currently three boreholes within the vicinity with comparable water level and quality data between 2011 and 2018 namely NSW1, NSW2 and NSW10. NSW2 is located where the opencast Pit H will be mined and NSW1 north of the N12 road outside the Pit H vicinity. NSW10 is the most likely borehole with the potential to supply water in the vicinity of Pit H. The water quality data for NSW10 between 2011 and 2018 has not changed significantly with major constituents such as pH, TDS, Cl, F, nitrate, and Na within SANS 241 (2015) drinking water guideline limits. However, NSW10 has had a significant drop in water level with a 10 mbgl drop in water level between 2011 and 2018. The dewatering activities during opencast mining at Pit H may impact the water level at NSW10 as a result of its close proximity to the pit. Alternative water supply sources may need to be investigated and a possible pipeline to Pit H established.

8.8.1.7 Groundwater Inflows to Pit H

The inflows for the total New Largo are reported as daily averages. The total calculated groundwater inflow rates range from 4526 – 5703 (53 L/s – 67 L/s) (LOM Version 6) over the time period 2015 to 2064 The mine footprint of these periods is from 41 043 530 m^2 to 51 718 097 m^2 for LOM Version 6.

Modelling results for Pit H indicate that high groundwater inflows into New Largo's proposed Pit H occur initially, but within 180 days (approximately 6 months), the inflows are below 10 L/s for the low inflow scenario and below 20 L/s for the high inflow scenario. After 9 years the inflows drop to 2.5 L/s and 6.1 L/s for the low and high inflow scenarios (Figure 30).

Average pit inflows for the full 9 years were 3.9 L/s and 9.2 L/s for the low and high inflow scenarios. These values were compared to the results from the JMA (2012) report by assuming that Pit H is one tenth of the area of all the pits that were modelled. In addition, an analytical model based on the equation from Marinelli and Nicoli (2000) was used for comparison. Table 15 shows that the predicted model inflows are at the low and high end of expected inflows modelled by JMA consulting (2012) and the analytical method.

A further consideration for both the analytical calculations and FEFLOW simulation of the groundwater inflow to the proposed Pit H pit is the assumption that the pit inflows for the entire pit footprint are being calculated when in reality mining opens these areas incrementally. Inflows at the high wall of the pit are thus expected to be far lower and are predominantly going to evaporate off the pit walls and not contribute significantly to the pit water that is required to be with dealt with by the sumps.

The Pit H northern perimeter straddles the east-west aligned sub-catchment divide, therefore continued upgradient groundwater inflow to the pit is also going to be negligible once mining has progressed in a generally down-gradient (southerly and easterly) direction as indicated by the latest mine plan. The pit spoils and rehabilitated areas behind the active box-cut will, however, increasingly receive direct recharge which will migrate through the spoils towards the active box cut and will need to be dewatered via a sump or possibly multiple sumps. This direct recharge has been included in the mine pit water balance calculations (Golder 2020 – see Appendix E) and does not form part of the groundwater inflows presented in Figure 30 and Table 15 below.

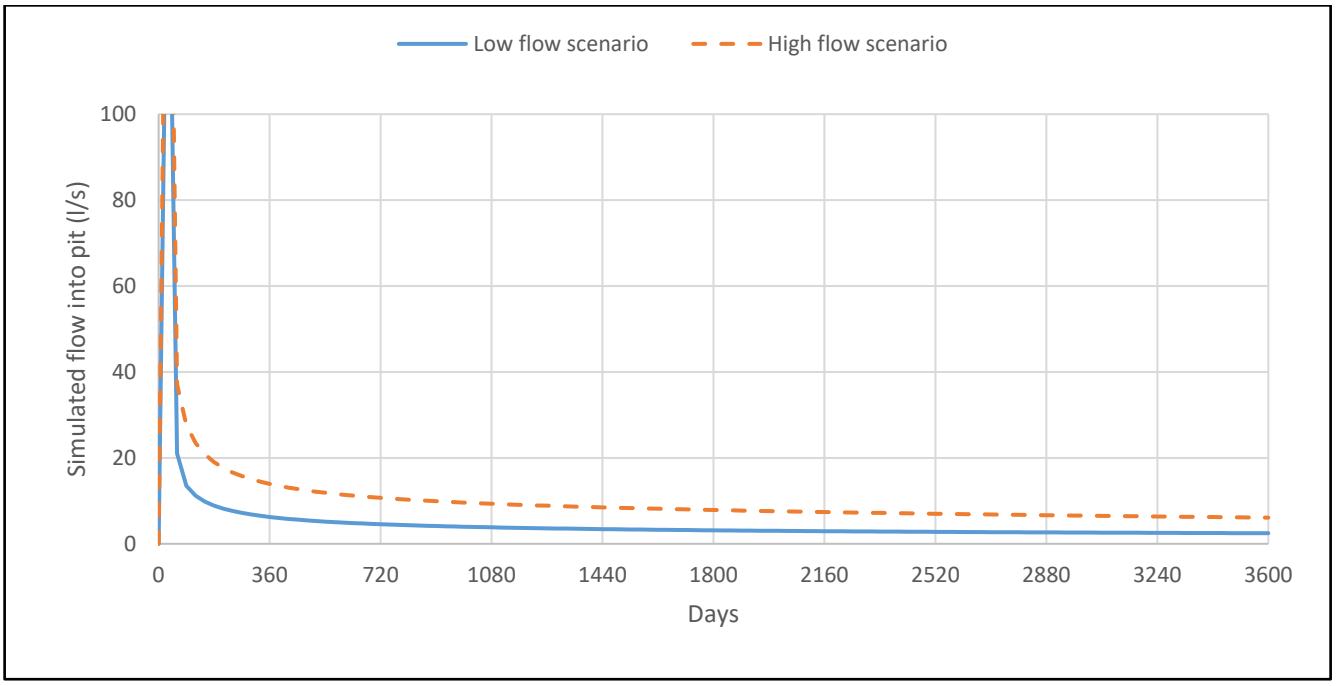

Figure 30: Simulated Groundwater inflow into Pit H using simple FEFLOW model.

Table 15: Predicted model inflows compared with JMA (2012) and analytical results

Source	m^3/day	L/s
Model (low inflow)	338.0	3.9
Model (high inflow)	797.0	9.2
JMA (LOM6)	508.9	5.9
JMA (LOM7)	469.4	5.4
Analytical method	400.0	4.6

8.8.1.8 Groundwater Inflows to Main Mine, including Pit D

The predicted life of mine groundwater inflows is given in Table 16 and visualised in Figure 31. It must be emphasised that the simulated inflows (Delta H, 2019) account for groundwater recharge over the opencast and backfilled areas, but not for any surface water make of the open pits (direct rainfall, surface water inflows). The inflow represents annually averaged values and does not account for seasonal variation.

Table 16: Predicted average life of mine inflows for the New Largo Colliery groundwater model

Year	ML/d	Year	ML/d	Year	ML/d
2022	0.3	2039	6.63	2056	7.7
2023	0.35	2040	6.46	2057	7.44
2024	0.55	2041	6.83	2058	7.95
2025	1.6	2042	6.64	2059	8.59
2026	1.68	2043	7.61	2060	7.9
2027	2.1	2044	7	2061	7.81
2028	5.68	2045	8.05	2062	7.85
2029	5.88	2046	7.6	2063	7.24
2030	5.38	2047	7.85	2064	6.16
2031	5.6	2048	7.93	2065	5.97
2032	5.74	2049	7.7	2066	6.36
2033	5.6	2050	7.92	2067	6.17
2034	6.7	2051	7.8	2068	4.6
2035	6.15	2052	7.74	2069	3.72
2036	6.4	2053	7.8	2070	3.14
2037	6.42	2054	7.74	2071	2.54
2038	6.32	2055	7.7	2072	1.36

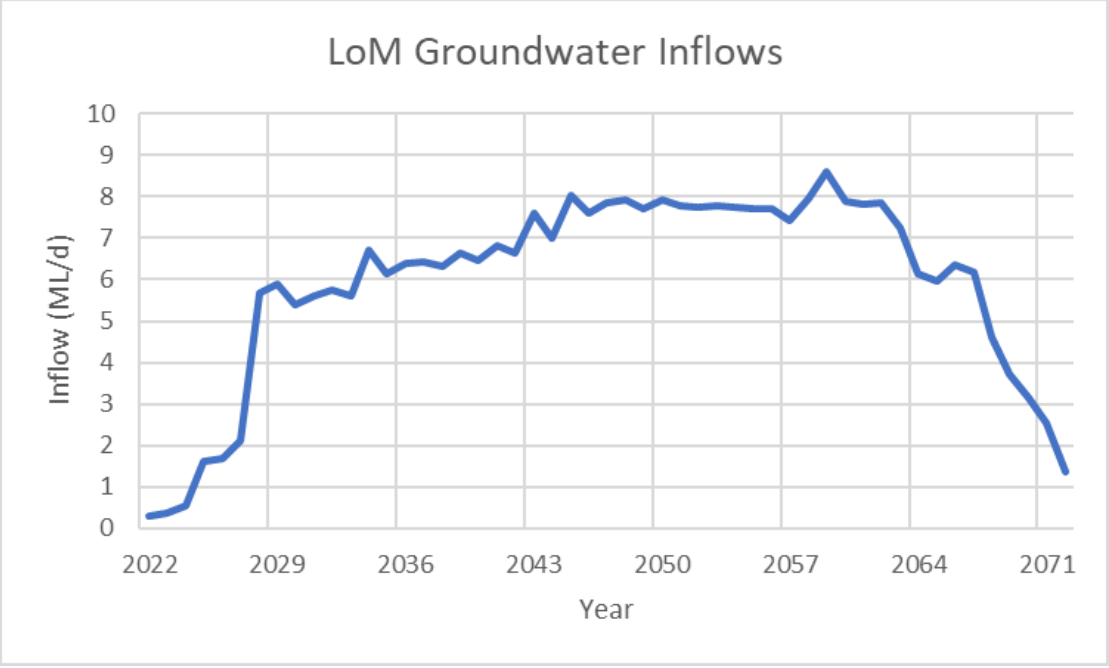

Figure 31: Simulated LoM groundwater inflows

There is a low point in the seam floor in the North of Pit D. The mining of the Pit D will join Pit E after 2043. The decant elevation in Pit D is lower than the floor elevation between Pit D and Pit E; the water that accumulates in the low point will be pumped to a dam to prevent spill. The recharge water from the Pit D extension to be mined by Africoal for New Largo will also report to the low point (Golder, 2019a). The groundwater model prepared by Delta H (2019) estimated 300 m3/d would report to the low point from the Pit D extension workings.

8.8.1.9 Groundwater Quality

The background groundwater quality using the samples obtained from the 28 investigative hydrogeological boreholes between 2004 and 2011 was described as distinctly Type B to Type C (Figure 32). All the boreholes in close proximity to Pit H and Pit D (LGW-B6, LGW-B25, LGW-B26 and LGW-B28) plot in Type B. This is mainly Ca/Mg-HCO_3 type water which is normally characterised by recently recharged water. The remaining baseline plot in Type C. This represents Na/Ca-HCO_3 and Na-HCO_3 type water which is normally characterised by typical flow of the aquifer. The piper diagram gives a good indication of the baseline groundwater condition, which is not yet impacted by mining activities.

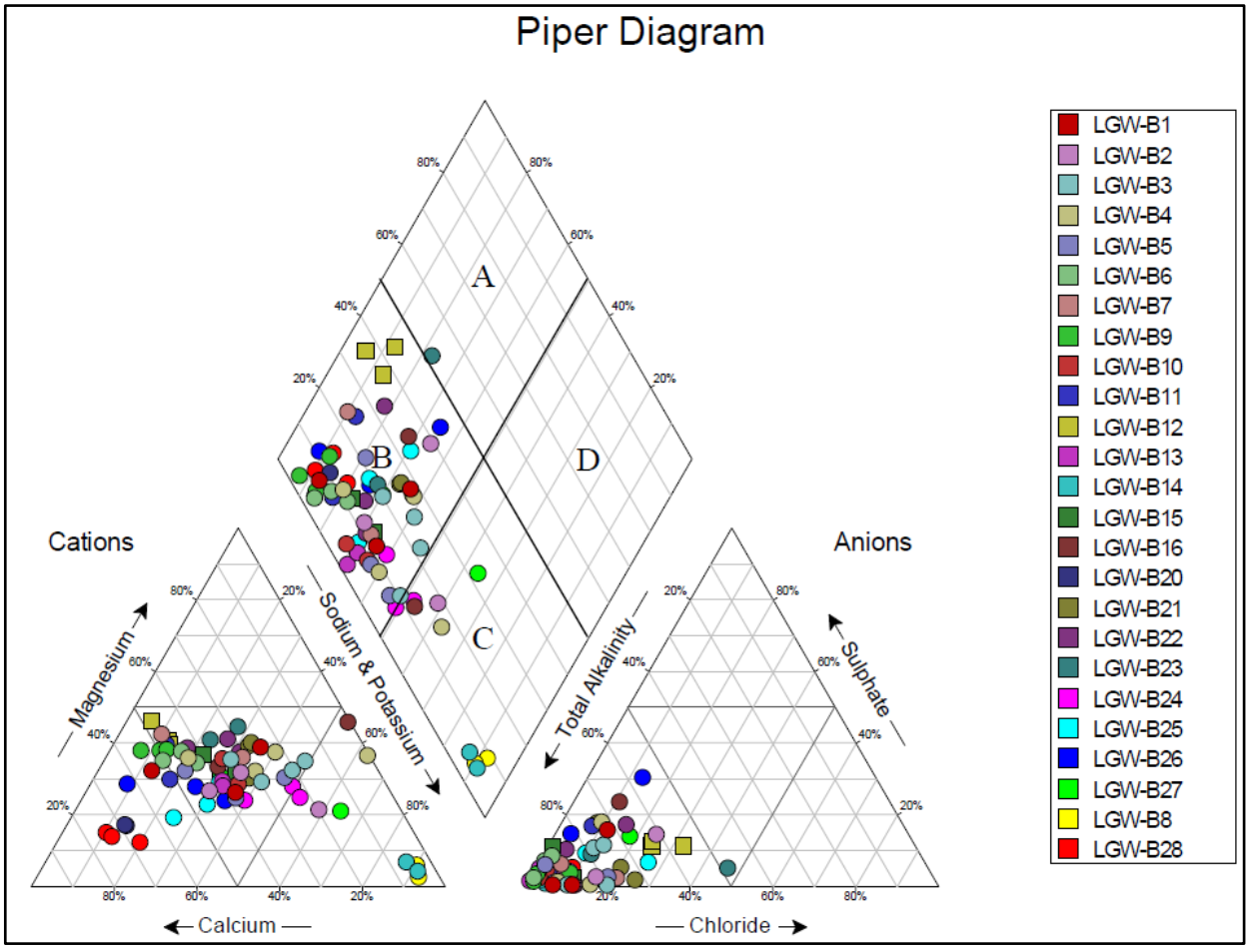

Figure 32: Piper Diagram of the Groundwater sampled at New Largo - taken from JMA (2012)

Exceedances with respect to individual dissolved elements in the groundwater of these 28 investigative boreholes were reported by JMA (2012) for Fluoride (F), Aluminium (Al), Iron (Fe) and Manganese (Mn). Borehole LGW-B28, closest to the Pit H area but 2 km north of the N12 highway did not report any exceedances.

A hydrocensus was conducted in November 2018 (Aquatico Scientific, 2018), focusing specifically on the area surrounding Pit H and Pit D to detect significant shifts in the physical or hydrochemical baseline groundwater

conditions since JMA (2012). This is of importance as any deterioration of the groundwater quality, since the last assessment may be due to nearby mining and or agricultural irrigation practices.

Twenty five (25) localities were visited by an independent and accredited water laboratory, Aquatico Scientific (AS), from which twenty three (23) waters samples were collected. Localities visited included two dams, one spring and 23 boreholes. A general drop in the water level was recorded in 2018 compared to that recorded in 2011 near the proposed Pit H based on boreholes NSW1 (to the north-east of Pit H) and NSW 10 (to the east of Pit H). There is a significant drop in water level in borehole NSW10, from 2 meters below ground level (mbgl) to 12mbgl. This shows that the general water table on the Pit H footprint lies between 0 and 10 mbgl (Specifically 6.82 mbgl in NSW2) and that there is some abstraction associated with domestic water supply wells in the Kendall Forest Holding area to the east of the proposed Pit H.

The proposed Pit H footprint straddles an east-west aligned groundwater flow divide, shedding groundwater from the Pit H footprint to the north and south almost equally. A slight depression of the groundwater flow is associated with abstraction of groundwater from several domestic and related purpose boreholes in the Kendal Forest Holding area to the east of the Pit H footprint.

The water chemistry data does not show a significant deterioration of water quality with respect to any of the reported variables between 2011 and 2018 in boreholes LGW-B6, NSW1, NSW2 and NSW 10. For monitoring site LGW-B6 located near Pit D there has been a general decrease in Ca, Mg, K, TDS and EC from 2011 to 2018 monitoring event. SO_4 increased from 8 mg/l to 11 mg/l which is still significantly low.

Most of the groundwater samples collected in 2018 (Figure 33) plot in similar portion of the quadrilateral field of the Piper diagram. (Type B) as in 2011 (Figure 32). Type B is Ca/Mg-HCO_3 type water which is characterised by recently recharged water. Of the three boreholes with data available for comparison, NSW10 immediately to the east of the proposed Pit H area has shown a significant shift in water chemistry composition from a Type B to Type A. Type A water which NSW10 plots in is Ca/Mg-Cl type water. This water type is characterised by water impacted by oxidation of pyrite, with chloride replacing the sulphate in the solution.

The surface water dams' samples (PH1, SW-HFN4), as well as the TAP sample collected by AS in 2018 exhibit a hydrochemical composition most likely affected by mining activities. This is likely due to upstream contamination of the drainage flowing east to west, south of the Pit H footprint. It has been noted that the dams in this drainage are being used for irrigation of the fields on the Pit H footprint and that therefore there is already a likely introduction of contaminants associated with the surface water samples from the dam (SW-HFN4) to the soils on Pit H.

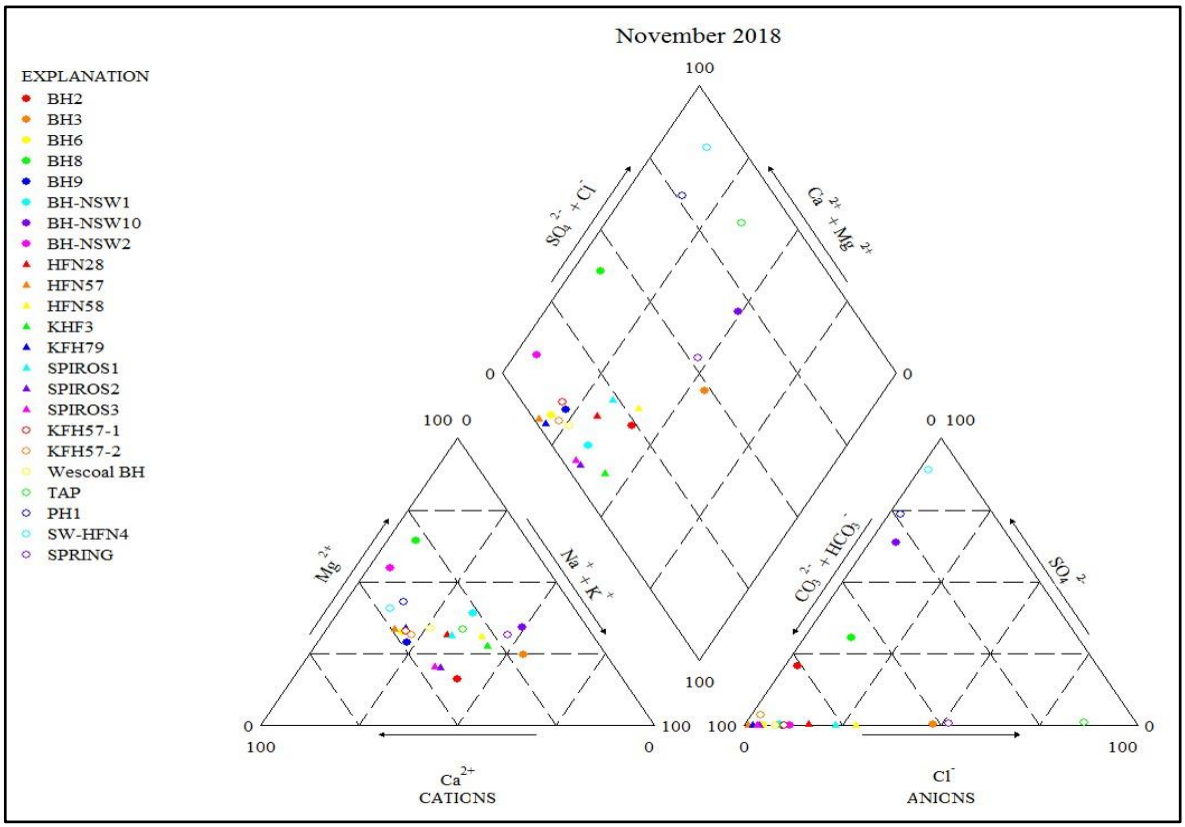

Figure 33: Piper Diagram illustration of the hydrochemical composition of the groundwater near Pit H (November 2018)

8.8.2 Surface Water

A specialist surface water impact assessment report for the integrated EIA and WUL application for the New Largo Coal Project was undertaken in 2012 by Jones and Wagener (2012) (Appendix C), with an update conducted in 2020 (Appendix E). The 2020 study included an update of the baseline situation based on surface water monitoring data and newly available regional datasets, to inform the re-evaluation of the impact assessment on the surface water systems associated with the MRA, and Pit H and Pit D in particular.

8.8.2.1 Regional Context

The New Largo Coal Project is located across the water divide of quaternary catchments B20F (Wilge River) and B20G (Saalklapspruit) (Figure 35). The Wilge River flows north on the western side of the mine area which includes the Pit H mini pit. An unnamed tributary drains east to west through several farm dams on the southern boundary of Pit H, and further north several unnamed tributaries and the Klipfonteinspruit drain east to west to the Wilge River from the MRA. The Klipfonteinspruit flows on the southern boundary of Kusile Power Station.

The Saalklapspruit flows north along the eastern side of the MRA to confluence with the Wilge River approximately 15km downstream of the mine area. Several unnamed tributaries drain west to east to the Saalklapspruit, and the Grootspruit drains east to west to the Saalklapspruit. Downstream of the Grootspruit confluence with the Saalklapspruit, three unnamed tributaries emanating from springs enter the Saalklapspruit on the south eastern boundary of the MRA.

8.8.2.2 Water Resource Classification

The Water Resource Classification Study (WRCS) places the following principles at the forefront of implementation:

1) Maximising economic returns from the use of water resources;

2) Allocating and distributing the costs and benefits of utilising the water resource fairly; and

3) Promoting the sustainable use of water resources to meet social and economic goals without detrimentally impacting on the ecological integrity of the water resource.

The Wilge River catchment has been classified as a Class II River and the Saalklapspruit as a Class III river, in Government Gazette No 39943, 22 April 2016, Notice No 466, National Water Act, 1998 (Act No.36 OF 1998) Classes and Resource Quality Objectives of Water Resources for the Olifants Catchment (DWS, 2016b), where the classes are described as:

- **Class I: Minimally used:** Water resource is one which is minimally used, and the overall condition of that water resource is minimally altered from its pre-development condition
- **Class II: Moderately used:** Water resource is one which is moderately used, and the overall condition of that water resource is moderately altered from its pre-development condition
- **Class III: Heavily used:** Water resource is one which is heavily used, and the overall condition of that water resource is significantly altered from its pre-development condition

8.8.2.3 The Reserve

The Reserve specifies the quantity, quality, habitat, and biotic integrity requirements necessary for the protection of the resource, has priority over other water uses, and will vary according to the class of the resource.

The Present Ecological State (PES) and the Ecological Importance and Sensitivity (EIS) of the rivers in the Wilge and Saalklapspruit catchments were determined during the Reserve classification study. The Bronkhorstspruit, Saalklapspruit and Upper Wilge rivers were found to be in a moderately modified state (category C) with fewer developed areas present in the catchment compared to other parts of the Upper Olifants catchment. The importance of the resources in this catchment was described as being moderate, especially in terms of good water quality contributed to the main stem Olifants River above Loskop Dam. Therefore, it was proposed to maintain the current PES category within the catchment. A Management Class II was recommended. This means that the area can be moderately used and that the water resource could be moderately altered from its pre-development condition.

The Ecological Water Requirements (EWR) site located on the Wilge River (EWR4) just downstream of the confluence of the Wilge River and the Saalklapspruit (Figure 34) (DWS, 2016) is shown in Figure 34.

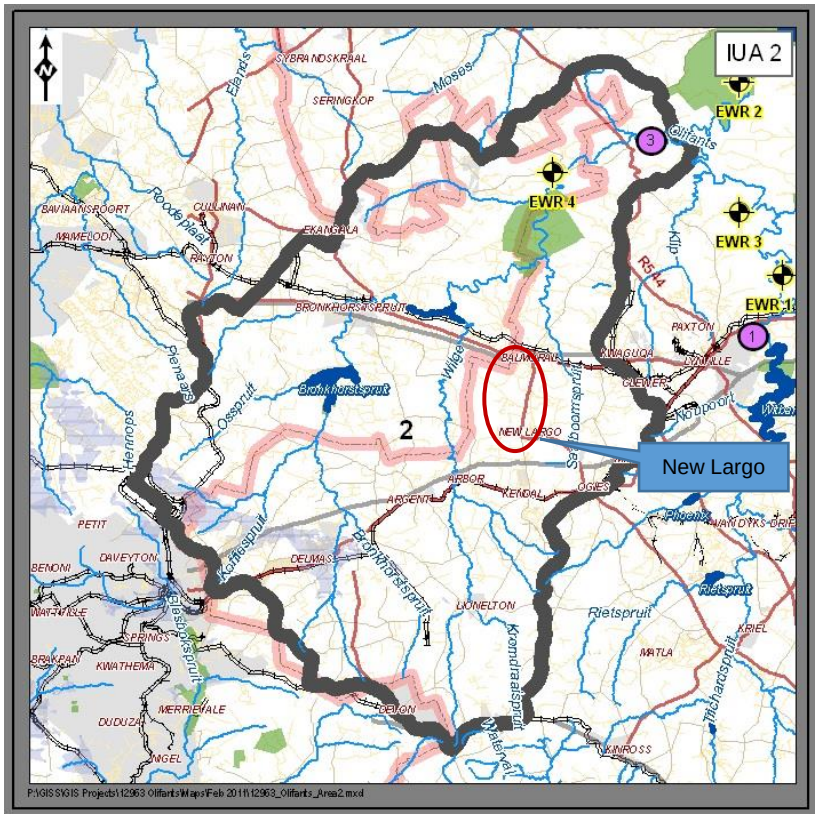

Figure 34: EWR 4 in relation to the New Largo area (DWS, 2016)

8.8.2.4 Resource Quality Objectives

Resource Quality Objectives (RQO) have been gazetted for the Wilge River catchment (DWS, 2016). Site EWR 4 is the site located on the Wilge River just downstream of the confluence of the Wilge River and the Saalklapspruit (and the MRA) at which RQOs (quantity and quality) have been set (see full report in Appendix E, 2020 Specialist Studies).

8.8.2.5 Flow and Water Quality Baseline Assessment

8.8.2.5.1 Ecological Flow Requirements

The Ecological Water Requirements (EWR) for the site located on the Wilge River (EWR4) just downstream of the confluence of the Wilge River and the Saalklapspruit are described in Appendix E.

8.8.2.5.2 Flow Data for the Wilge River and Saalklapspruit

Flow data was collected as part of the biomonitoring wet and dry season monitoring conducted by New Largo during July and November 2017 and February 2018. Sites NL1 and NL9, respectively the most up and downstream points on the Wilge River; and NLS10 and NLS18 (Figure 35), respectively the most up and downstream monitoring points on the Saalklapspruit, indicate the contributions made by the tributaries draining to the two water resources. It will therefore be important to maintain the flow from these tributaries to ensure that the Reserve is met at EWR4.

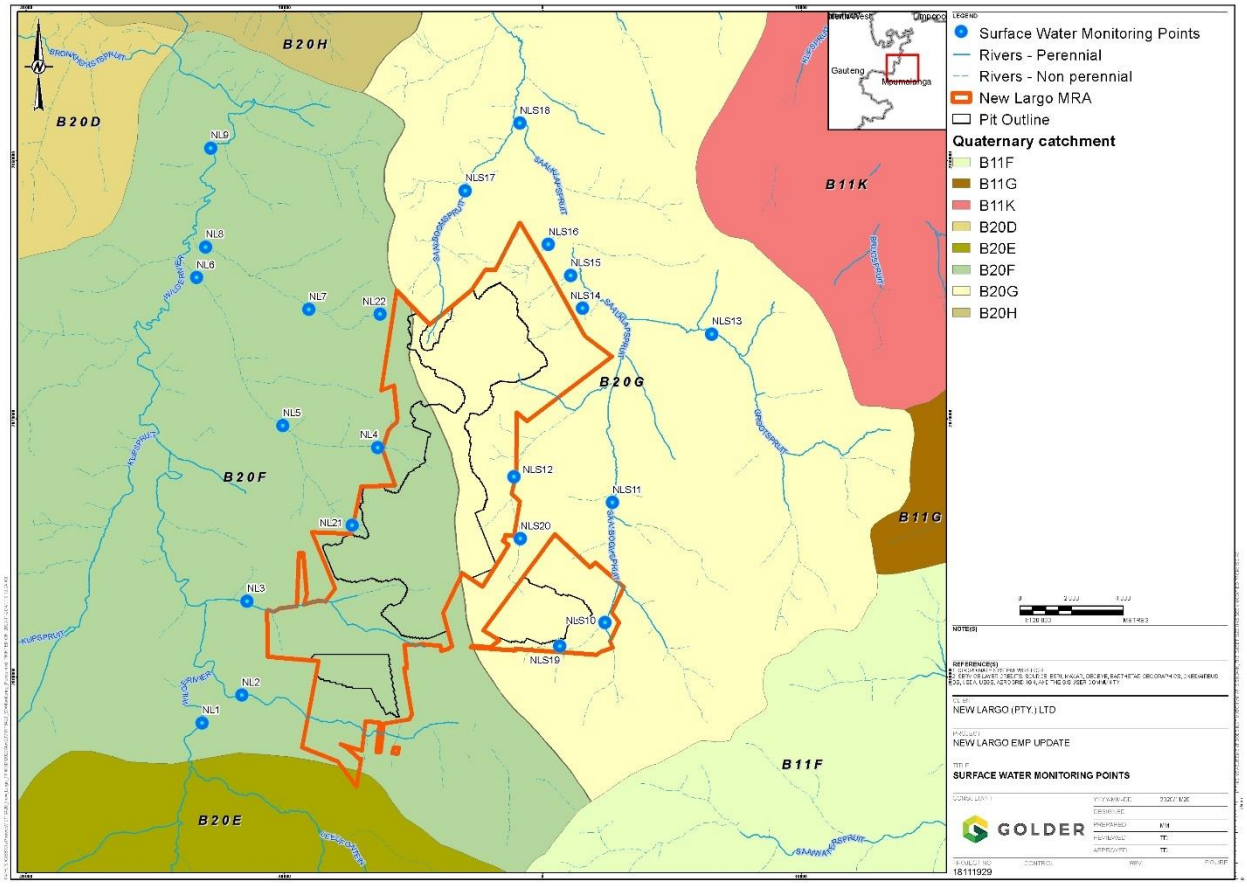

Figure 35: New Largo MRA showing surface water monitoring points

8.8.2.5.3 Floodlines

Floodlines have been determined for the scenarios listed below. Maps depicting each of the determined floodlines are included in Appendix B of the 2020 surface water report (Appendix E):

- 1 in 100 and 1 in 250 Year Flood lines undertaken in 2012 for the unnamed tributaries east of the New Largo MRA and draining to the Wilge River.
- 1 in 100 and 1 in 50 year flood lines undertaken for the unnamed tributaries draining west of the New Largo MRA from Honingkrantz Pan to the Saalklapspruit.
- 1 in 100 and 1 in 50 Year flood lines undertaken for an unnamed tributary west of the NL Mine draining to the Saalklapspruit, and a portion of the Saalklapspruit near the Township of Phola.
- Flood lines for the unnamed tributary draining to the Wilge River, south of Pit H.

8.8.2.5.4 Assessment of Water Quality Data

Department of Water and Sanitation, under the Ministry of Human Settlements, Water and Sanitation, has set Water Quality Planning Limits (WQPL) for the sub-catchments of the Upper Olifants catchment which includes the Wilge River catchment (DWS, 2017). These limits have been set to support the water quality component of the Resource Quality Objectives (RQO) and will be used to inform the discharge limits. The WQPL have therefore been used to compare the most recent available baseline data gathered by New Largo (June 2020) (refer to the 2020 surface water report, Appendix E).

Wilge River

The 95-percentile data for monitoring points along the Wilge River indicate that the Wilge upstream of the New Largo MRA (NL1) is already considerably impacted, however the quality improves considerably by the time it reaches the point downstream of the MRA (NL9).

The trends for TDS and sulphate indicate increasing concentrations: considerably above the WQPL at the upstream point and marginally above the WQPL at the point downstream, while pH falls mostly within the upper and lower pH limits.

pH levels were all within the limit values and metals measured were recorded as being below detection level.

Saalklapspruit

The 95-percentile data for monitoring points along the Saalklapspruit indicate that the Saalklapspruit upstream of the New Largo MRA (NLS10) is already considerably impacted, and unlike the Wilge River, the quality deteriorates considerably by the time it reaches the point downstream of the MRA (NLS18). The sample taken at NLS 10 in May 2020 showed TDS of > 1 800 mg/L and sulphate > 1 200 mg/L indicating severe upstream impacts from existing mining activity.

Trends of TDS, sulphate and pH for points up and downstream of the New Largo MRA on the Saalklapspruit indicate increasing concentrations considerably above the WQPL at both the upstream and downstream points. pH is also of concern with an indication of occasional acidic conditions.

The calculated load for the flow data available indicates that the largest contribution of load to the Wilge River system at NL18 is currently from the Grootspruit.

Considering the overall perspective of the streams in and around New Largo MRA, the Saalklapspruit contributes considerably more sediment load than the Wilge River.

8.8.2.6 Summary of Changes Described Since 2012

The major differences in the baseline description relate to:

1) Legislative requirements where the following have been gazetted for the catchment:
    a. Classification of the water resources,
    b. Resource Quality Objectives, and
    c. The Reserve.
2) Water Quality Planning Limits have been set for the catchment.
3) It is noted that the Wilge River catchment has been classified as a Class II river while the Saalklapspruit catchment has been classified as a Class III river. This means that the resource quality objectives (RQO) gazetted and the water quality planning limits (WQPL) set to support water resources protection will be stricter for the Wilge River catchment compared to those for the Saalklapspruit catchment.
4) Increased development upstream of the New Largo MRA.

Wilge River

Surface water monitoring points NL1 (upstream of the New Largo MRA) and NL9 (downstream of the New Largo MRA) in the Wilge River give a good indication of changes over time.

- The data at NL1, on the Wilge River upstream of the New Largo MRA, indicates increasing trends in TDS and sulphate concentrations from 2012 to May 2020. The same is true for the data assessed at NL9, just

north of the N4 and downstream of the MRA, however the trend is less marked and the impact of the better quality water flowing into the Wilge River from the various streams downstream of NL1, and particularly north of the N12, is clear. The data indicate that NL1 is consistently above the water quality planning limits while the data at NL9 was below the WQPL up until about the end of 2016, increasing over the following years to consistently be above the WQPL.

- The pH at these two points has remained mostly within the neutral to slightly alkaline range, however there are times when the pH has decreased to below 6.
- Another important monitoring point in the Wilge River catchment is NL2, located on an unnamed tributary that flows east to west on the southern boundary of the New Largo MRA. This point is downstream of Pit H and there are several farm dams located along the stream. The data here indicate that that there are already considerable upstream impacts, mostly relating to mining activities, that have increased since 2012, changing from being just within or marginally above the WQPL to being consistently above the WQPLs for TDS and sulphate.

Saalklapspruit

Surface water monitoring points NLS10 (upstream of the New Largo MRA) and NLS18 (downstream of the New Largo MRA) in the Saalklapspruit give a good indication of changes over time.

- Data at monitoring point NLS10 at upstream of New Largo MRA indicates that the water chemistry is already considerably changed indicating impacted water quality, however the data is quite irregular, with time where the data is compliant to the WQPL. Unlike the Wilge River, the quality deteriorates considerably by the time it reaches the point downstream of the MRA (NLS18). The sample taken at NLS 10 in May 2020 showed TDS of > 1 800 mg/L and sulphate > 1 200 mg/L indicating severe upstream impacts from existing mining activity, compared to the 95 percentile data of 1 135mg/L TDS and 703 mg/L sulphate.
- pH is also of concern with an indication of occasional acidic conditions compared to more alkaline conditions prior to 2012.

8.8.3 Terrestrial Ecology

An Ecological Specialist Assessment was conducted by EkoInfo CC & Associates (hereafter EkoInfo) in support of the 2012 Environmental Social Impact Assessment (ESIA) (Appendix C). This study focused on the entire mining rights area (approx. 10 300 ha) and included both flora and fauna assessments.

The 2020 study included an update of the baseline situation based on a review and update of the information presented in the EkoInfo (2011) study, and incorporation of the more recently developed Mpumalanga conservation sector plan, as well as the most up-to-date land cover mapping, and species conservation status. The existing baseline data was supplemented by a field survey conducted in June 2020, to update the ecological baseline in the Pit D and Pit H locations, where new infrastructure is proposed. The Phase 0 infrastructure area was not visited during the field survey, since the area is covered by maize and is therefore considered transformed. The updated 2020 baseline was then used to inform the re-evaluation of the impact assessment on the surface water systems associated with the MRA, and Pit H and Pit D in particular (Appendix E).

8.8.3.1 Regional Context

The New Largo MRA is located in the grassland biome, which covers approximately 28% of South Africa and is the dominant biome of the central plateau and inland areas of the eastern subcontinent (Manning, 2009; SANBI, 2013). Grasslands are typically situated in moist, summer rainfall regions that experience between 400 mm and 2000 mm of rainfall per year. Vegetation is characterised by a dominant field-layer comprising grasses and herbaceous perennials, with little- to no woody plants.

The MRA coincides with three regional vegetation units (Mucina & Rutherford, 2006); Eastern Highveld Grassland, and Rand Highveld Grassland, both of which are considered Endangered; and Eastern Temperate Freshwater Wetlands.

8.8.3.2 Mpumalanga Biodiversity Sector Plan (2013)

According to the spatial delineations of the Mpumalanga Biodiversity Sector Plan (MBSP) (2013), the majority of the MRA consists of 'Modified' habitat. The small and elongated patches of non-developed land associated with drainage features are generally classified as 'Other Natural Areas'. Areas designated as 'CBA[1] – Optimal' and 'CBA – Irreplaceable' are also present, mostly located in the northern extent of the MRA, and associated with the area where *F. humillis* was previously identified. With reference to Pit H and Pit D, no land designated as a Critical Biodiversity Area by the MBSP (2013) is present in, or immediately adjacent to, the proposed development footprints..

8.8.3.3 Vegetation Communities

Four vegetation communities and six sub-communities / transformed areas occur in the MRA (EkoInfo 2011):

- High lying rocky shrubland community;
- Tall dry grassland community on sandy midslopes;
  - Tall dry grassland sub-community on sandy, slightly shallower, rockier midslopes;
  - Tall dry grassland sub-community on sandy, deeper midslopes;
- Tall moist grassland community on seldom waterlogged footslopes;
  - Tall moist grassland sub-community on seldom waterlogged footslopes associated with fluctuating water tables;
  - Tall moist grassland sub-community on seldom waterlogged footslopes associated with lateral water movement;
- Tall wet grassland community on regular waterlogged footslopes;
  - Tall wet grassland sub-community on regular waterlogged footslopes with sandy soils;
  - Tall wet grassland sub-community on regular waterlogged footslopes with clayey soils.

8.8.3.4 Pit D

The development footprint of Pit D comprises mostly cultivated fields, large areas of grassland, and alien tree stands. The cultivated fields are under soy production. Most areas of grassland have been disturbed and are characterised by secondary grassland of the tall dry grassland on sandy midslopes community, dominated by the tall thatching grass *Hyparrhenia hirta*, with *Aristida congesta* and *Pogonarthria squarrosa* also commonly observed species.

A major state change that has occurred within the Pit D footprint since 2012 is the commencement of mine preparation activities, and specifically, the establishment of topsoil stockpiles. It is also noted that Klipfontein Coal Mine which is located on the western boundary of the Pit D footprint has significantly expanded their operations.

[1] Critical Biodiversity Area

8.8.3.5 Pit H

Pit H is located immediately south of the N12 highway. The pit footprint and most of the adjacent land where proposed infrastructure will be located consists of cultivated maize fields. Small patches of managed pasture, and non-cultivated areas of secondary grassland of the tall moist grassland on seldom waterlogged footslopes community, alien tree stands and wetland (tall wet grassland on regularly waterlogged footslopes) are also present.

In the managed pastures, *Digitaria eriantha* is the primary cultivated species. At the time of the field visit, pasture areas had recently been mown and baled, which resulted in a uniformly short lawn-like grass cover. No forbs were recorded in the managed pastures. A large area of non-cultivated land is located in the north-west corner of Pit H, characterised by secondary grassland of the tall dry grassland on sandy midslopes community. The smaller non-cultivated areas are variously dominated by inter alia, *Hyparrhenia hirta* and various Eragrostis species in dry terrestrial habitats, and hydrophilic species such as *Imperata cylindrica* in moist grassland communities.

The characteristics of land associated with the proposed footprints of Pit H have not changed since the initial baseline was conducted in 2012. It is however noted that that a large mine has established on the northeast boundary of the development.

8.8.3.6 Red List and Protected Flora

Four flora taxa of conservation concern have been recorded in the MRA (EkoInfo 2012); *F. humilis*, which is listed as Vulnerable (previously Endangered) on the South African Red List; and Crinum sp., Ammocharis sp., and *Boophone disticha*, all of which are listed as Protected in Mpumalanga Province.

An additional ten species potentially occur in the MRA, based on habitat suitability assessment. None of these species were identified in the Pit D or Pit H areas during the supplementary field survey conducted in July 2020 in support of the EMP update.

8.8.3.7 Medicinal Plants

Eleven species and one genera recorded in the MRA are of purported medicinal value (EkoInfo 2012). These include various *Helichrysum* species*, Vachellia karroo, Boophone disticha, Centella asiatica, Elephantorrhiza elephantina, Lippisa javanica, Pelargonium luridum, Pellaea calomelanos, Pentanisia prunelloides, Scabiosa columbaria, Vernonia oligocephala* and *Xysmalobium undulatum*.

8.8.3.8 Alien and Invasive Plant Species

Nine declared invasive species have been recorded in the study area (EkoInfo 2012). During the 2020 survey, a stand of black wattle (*Acacia mearnsi*) was observed in the proposed Pit D study area, as well as wild tomato (*S. sisymbrifolium*) which occurs on field margins.

8.8.3.9 Faunal Communities and Species of Conservation Concern

8.8.3.9.1 Mammals

Twenty-seven mammal species have been recorded in the MRA (EkoInfo, 2012), four of which were considered species of conservation concern in 2012. Two of these species, the Bushveld Gerbil and Honey Badger, have been subsequently down-listed on the 2016 national mammal Red List to Least Concern status.

The Cape Clawless Otter was recorded in the study area in 2012, but at the time was not considered a species of conservation concern. This species has since been up-listed on the 2016 national mammal Red List, and is currently considered Near Threatened.

8.8.3.9.2 Birds

In total, 75 bird species, including five species of conservation concern, have been recorded in the MRA. An additional 24 bird species of conservation concern potentially occur in the MRA (EkoInfo, 2012). The conservation status of two have been up-listed since then: Secretary bird has been up-listed from Near Threatened to Vulnerable, while Martial Eagle has been up-listed from Vulnerable to Endangered.

8.8.3.9.3 Herpetofauna (Reptiles and Amphibians)

Ten reptile species and three frog species were recorded in the MRA by EkoInfo (2012). None of the recorded species are of conservation concern. Species of conservation concern with potential to occur in the MRA include:

- Giant Bullfrog (*Pyxicephalus adspersus*) – listed as Protected on NEMBA ToPs List;
- Giant Girdled Lizard (*Smaug giganteus*) – listed as Vulnerable on national Red List; and
- Striped Harlequin Snake (*Homoroselaps dorsalis*) – listed as Near Threatened on national Red List.

8.8.4 Wetland Ecology

Wetland impact assessments were conducted by Wetland Consulting Services for the main New Largo mine as well as the R545 relocation, in support of the 2012 Environmental Social Impact Assessment (ESIA) (Appendix C). Wetland Consulting Services also developed a strategy for the development of a wetland offset plan at that time (Appendix C). The results of recently conducted surveys of pans in the study area (Golder, 2020b; Digby Wells, 2020) were also used in the update of the wetland baseline description for the MRA.

The approach followed for the updated 2020 wetland study included a review and synthesis of the aforementioned existing reports pertaining to the broader New Largo Mining Rights Area (MRA), supplemented by a field survey to update the wetland baseline data for the Pit D and Pit H locations, where new infrastructure is proposed. Since the area in proximity (within 500m) to the proposed new Phase 0 infrastructure is currently under maize, or under development as part of the Kusile Power station footprint, no additional fieldwork was conducted in this area. The updated 2020 baseline was then used to inform the re-evaluation of the impact assessment on the surface water systems associated with the MRA, and Pit H and Pit D in particular (Appendix E).

8.8.4.1 Wetland Classification

The extent and distribution of the different wetland types within the New Largo MRA are presented in Table 17.

Table 17: Area of wetlands within MRA and opencast footprint (LoM)

Wetland Type	MRA (ha)	LoM (ha)
Channelled valley-bottom wetland	0.89	-
Unchannelled valley-bottom wetland	2.32	0.02
Valley bottom wetland	355.90	1.71
Pan	143.80	134.14
Hillslope seepage	1065.96	353.53
TOTAL	**1568.88**	**489.40**

8.8.4.2 Present Ecological Status

The entire study area has been impacted by agricultural and mining activities together with roads and railway infrastructure. Because of these activities, none of the wetlands can be regarded as pristine. Existing impact sources include:

- Sand mining operations;
- Agriculture including cultivated fields, planted pastures and livestock farming;
- Railway infrastructure;
- National, Provincial and farm road infrastructure; and
- Kusile Operations (commenced late 2014, ramping up over time to full production).

The majority of the wetlands fall in either PES Category D, representing systems where large change in ecosystem processes and loss of natural habitat and biota had occurred (PES D); or PES Category C, representing systems where a moderate change in ecosystem processes and loss of natural habitats had taken place but the natural habitat remains predominantly intact (Macfarlane et al., 2008).

8.8.4.3 Changes to 2012 Baseline

The PES category of the wetlands at Pit D and Pit H has not changed since the initial baseline was conducted.

Sand mining has expanded further into the catchment of Honingkrantz Pan and its immediate surrounding area, since the initial baseline work was done in 2006-2007, and 2011. The results of modelling of water levels in the pan vs annual rainfall indicated that the pan water levels observed in the years 2013-2019 reflect rainfall that occurred in this period and were not caused by existing mining impacts. Hence the dryness of the pan at present is most likely not a reflection of the sand mining expansion since the year 2013. This is supported by the observation that the sand mining expansion in that period did not occur in the pan surface water or groundwater catchment. During the site visit on 18 April 2019 (although only a rapid visual assessment of conditions was undertaken) there was no evidence to suggest that there were additional hydrological impacts to the pan compared to those already observed in 2012/13. Although a slightly increased impact score was calculated the PES Category C Moderately Modified was unchanged.

8.8.4.4 Ecological importance and sensitivity (EIS)

The majority of the wetlands in the MRA do not score highly in terms of ecological importance and sensitivity as they do not support unique populations, and are ubiquitous within the Upper Olifants catchment (EIS Class C). Most are sensitive to changes in flow and water quality, with an increase in flow associated with a change in water quality, particularly in the valley bottom wetlands, generally favouring the development of Typha or Phragmites dominated systems.

Since no significant land use changes were deemed to have occurred since the previous assessments, no changes to the EIS category of Honingkrantz Pan and wetlands at Pit D and Pit H assigned in 2012 were made in the 2020 baseline description.

8.8.5 Aquatic Ecology

An Ecological Specialist Assessment was conducted by EkoInfo CC & Associates in support of the 2012 Environmental Social Impact Assessment (ESIA) (Appendix C). This study focused on the entire mining rights area (approx. 10 300 ha) and included an aquatic impact assessment.

The 2020 study included an update of the baseline situation based on a review of the information presented in the EkoInfo (2011) study, updated by a full suite of annual aquatic biomonitoring survey reports from surveys

conducted in the rivers of the MRA during 2012-2020 (Ecotone, 2012-2018; 2019, 2020; Digby Wells, 2020). No additional field data gathering was considered necessary to inform the baseline description, as part of the current study. The updated 2020 baseline was then used to inform the re-evaluation of the impact assessment on the aquatic ecosystems associated with the MRA, and Pit H and Pit D in particular (Appendix E).

8.8.5.1 Regional Context

The MRA falls within the Olifants Water Management Area (WMA2) Highveld (11) Ecoregion (Mucina and Rutherford, 2006), quaternary catchments B20F (Wilge River) and B20G (Saalboomspruit and Saalklapspruit). The Olifants Catchment is often described as South Africa's hardest working catchment owing to extreme demand for the natural resources, and subsequently is the most threatened river systems in South Africa (Van Vuuren, 2009). The rivers within this catchment are associated with land modification and pollution, primarily mining-related disturbances which is the primary cause of impairment of river health, coupled with industrial activities and extensive agricultural activities (DWAF, 2001). As the Olifants River and its adjoining tributaries flow through this heavily utilised economic hub, they are classified as highly stressed (DWAF, 2001) and the overall ecological status being classified as 'poor to unacceptable' (DWAF, 2001; Van Vuuren, 2009; DWS, 2014).

The Wilge River flows north on the western side of the MRA. Several unnamed tributaries and the Klipfonteinspruit drain east to west to the Wilge River from the MRA. The Klipfonteinspruit flows on the southern boundary of Kusile Power Station. The Saalklapspruit flows north along the eastern side of the MRA, where it joins and becomes the Saalboomspruit north of the MRA, to confluence with the Wilge River approximately 15km downstream of the mine area. Several unnamed tributaries drain west to east to the Saalklapspruit, and the Grootspruit drains east to west to the Saalklapspruit. Downstream of the Grootspruit confluence with the Saalklapspruit, three unnamed tributaries emanating from springs enter the Saalklapspruit on the south eastern boundary of the MRA.

8.8.5.2 Current baseline for the MRA

8.8.5.2.1 In situ water quality

In situ variables including EC, pH and turbidity have been measured at the two pan sites and the 18 monitoring sites on the Wilge and the Saalklapspruit/Saalboomspruit systems across the monitoring periods.

Pans

The most recent wet season results (November 2019) continue to indicate higher values for both pH and electrical conductivity (EC) at Pan 1, compared to the previous wet season monitoring events (Pan 2 was dry). Historical data for Pan 1 shows a generally increasing trend for EC values between 2012 and 2019 (Digby Wells Environmental, 2020).

Wilge

In general, the Wilge system has greater ecological integrity than the Saalklapspruit and Saalboomspruit. The most notable hot-spot sites in terms of increased salt load (EC) include NL4, NL5 and NL6. Most of the Wilge sites had circumneutral pH and were within an Ideal range in the most recent survey (November 2019).

Saalklapspruit and Saalboomspruit

The most notable hot-spots in terms of increased salt load (EC) in the Saalboomspruit and Saalklapspruit system include sites NLS10, NLS11, NLS13 and NLS18. The most recent survey data (November 2019) showed that the EC at NLS10 and NLS13 was significantly higher (>double) compared to the other tributaries. The pH for most sites were within the Ideal range.

The temporal variations within the response metrics associated with the problem sites on both the Wilge and the Saalboomspruit and Saalklapspruit are often outside the seasonal boundary conditions, reflecting

moderately strong to strong correlation with the temporal variation in pH and EC, subsequently suggesting water quality related impacts. From an EC perspective, the majority of the sites have exhibited elevated values, especially in relation to the selected EC guideline values, since the initial 2012 baseline to date. This is likely directly associated with upstream coal mining activities, including a potential colliery near Arbor siding (i.e. Site NL1), Klipspruit Colliery (i.e. Site NLS10 Site NLS11), and Elandsfontein Colliery along the Grootspruit wetland system (i.e. Site NLS13) (Digby Wells Environmental, 2020).

8.8.5.2.2 Whole Effluent Toxicity

Whole Effluent Toxicity (WET) tests were conducted on two taxonomic groups (invertebrate *Daphnia magna* and fish *Poecilia reticulata*) in order to determine the potential toxicity risk of the water quality to the biological integrity of NLS11 and NLS13, based on water samples taken on a once-off basis in 2018 (EcoTone, 2018).

Although NLS11 was found to be chronically polluted due to the upstream Phola Waste Water Treatment Works (WWTW), the samples retrieved from this site showed no acute/chronic toxic hazard to either macroinvertebrates or fish. NLS13, which is located on the Grootspruit and drains some opencast mining areas on the Elandsfontein area, indicated a Very High acute toxic hazard, resulting in 100% mortality of both macroinvertebrates and fish, which was in agreement with previous trends. Upstream coal mining and Evraz Highveld Steel and Vanadium smelter activities were thought to be the likely main contributors to the toxicity of water sampled at NLS13 (EcoTone, 2018).

8.8.5.2.3 Diatoms

The most recently sampled diatom assemblages generally indicate that sites on the Wilge appear to have better water quality than the Saalboomspruit (Ecotone, 2020), which is generally in agreement with historical trends observed in the Wilge since biomonitoring surveys for New Largo commenced.

The latest diatom results from samples taken in February 2020 (Ecotone, 2020) indicated that the sites on the Wilge system (NL2 – NL7) appeared to be slightly impacted with relatively low levels of organic pollution reflecting Moderate to Poor ecological water quality. The river at Site NL8 was reportedly dry, however the sampled diatoms reflected Good ecological water quality conditions, showing a slight improvement compared to the upstream site NL7.

The Saalboomspruit and Saalklapspruit system (NLS11 – NLS13) appeared to be slightly impacted with relatively low levels of organic pollution reflecting Moderate to Poor ecological water quality; however, site NLS17 (Saalboomspruit) reflected Good ecological water quality conditions showing a slight improvement downstream. The relatively low levels of organic pollution suggest that the impacts observed at the sites may be associated with other types of pollution in conjunction with organic pollution. The temporal analysis indicates that the ecological water quality at all the sites on both the Wilge and Saalboomspruit systems appeared to have either remained in a stable condition or declined compared to previous surveys, except for site NLS17 which showed a slight improvement.

8.8.5.2.4 Habitat Diversity and Availability

Overall, the habitat availability observed throughout the study area was largely poor, with a select few sites along the Wilge River having adequate or good habitat availability.

The largely poor habitat availability and diversity observed in the study area reflects the inherent nature of the watercourses in which they are located i.e. channelled valley-bottom wetlands (Digby Wells Environmental, 2020). These channelled valley-bottom wetland systems typically have low habitat diversity and availability as a result of their position in the landscape. These sites generally had a lack of a sufficient stones biotope or any substantial hydraulic/flow diversity (i.e. presence of riffles, rapids or runs) that would normally be present within riverine systems (Digby Wells Environmental, 2020). Furthermore, considerable headcut erosion, continual

bank erosion and inundated banks is further a characteristic of these systems. Consequently, these conditions were expected to limit the potential of these systems to support a diverse aquatic macroinvertebrate community.

However, along the lower reaches of the Wilge River system (Sites NL7, NL8 and NL9) and the downstream site on the Saalklapspruit, above the confluence with the Saalboomspruit (Site NLS18), the habitat availability and diversity have improved. These river reaches were more representative of typical riverine conditions with improved flow and the presence of cobbled runs-riffle complexes. Consequently, several sensitive species with a preference for these types of niche habitats were expected to be present, some of which were then confirmed during biomonitoring studies, primarily along the lower Wilge River system (EcoTone, 2012 - 2018; Digby Wells Environmental, 2020).

8.8.5.2.5 Macroinvertebrate community assemblages

During the latest study conducted by Digby Wells Environmental (2020), the Macroinvertebrate Response Assessment Index (MIRAI) was undertaken. While SASS5 does not have a particularly strong cause-effect basis for interpretation, the aim of the MIRAI was to provide a habitat-based cause-and-effect foundation to interpret the deviation of the aquatic macroinvertebrate community from the reference condition (Thirion, 2007). This does not preclude the calculation of SASS5 scores that were previously done, but encourages the application of MIRAI assessment, even for River Health Programme purposes, as the preferred approach. As a result of the MIRAI model being used only for one season, the baseline conditions will be compared between 2012 and 2018, based on the aquatic macroinvertebrate community's biotic integrity (PES) scores.

Overall, the aquatic macroinvertebrate assemblages and abundances recorded since 2012 (EcoTone, 2012 - 2018; Digby Wells Environmental, 2020), are a reflection of the poor habitat availability within the water courses of the study area (valley bottom wetland systems). However, the perceived ecological conditions were notably improved along the lower reaches of the Wilge, Saalboomspruit and Saalklapsruit (i.e. Site NL9, Site NLS17 and Site NLS18 respectively).

In terms of the aquatic assemblage identified since the initial baseline in 2012 to date (2019), the following species which have a preference for niche habitats were recorded within the Wilge River system during the latest survey (Digby well 2020), and which were not initially recorded in 2012. These include *Atyidae* (Freshwater Shrimps), *Leptophlebiidae* (Prongill Mayflies), *Polymitarcidae* (Pale Burrowers), *Platycnemidae* (Brook Damselflies), *Elmidae* (Riffle Beetles), and *Crambidae* (Aquatic Caterpillar). Similarly, two sensitive taxa were exclusively present along the Saalboomspruit, namely *Lestidae* (Emerald Damselflies) and *Hydraenidae* (Minute Moss Beetles).

8.8.5.2.6 Fish

The three most abundant indigenous fish species, across surveys conducted from 2012 – 2019, continue to be *Enteromius anoplus, Pseudocrenilabrus philander* and *Tilapia sparrmanii*. The fish assemblages recorded in 2012 are consistent with those in 2019 and thus these have been the dominant species sampled in the highest abundances and with the highest frequency of occurrences; all are of Least Concern. No fish species of conservation concern have been recorded to date during these surveys (EcoTone, 2012 - 2018; Digby Wells Environmental, 2020).

It has been observed over time that there has been an ichthyofaunal shift from *E. sp. nov. 'South Africa'* to *E. anoplus* and/or *Tilapia sparrmanii* which may be correlated with surrounding land uses negatively impacting upon the associated watercourses (Rashleigh et al., 2009). *Enteromius sp. nov. 'South Africa'* are less tolerant to flow and modified aquatic ecosystems, and as a result are absent at impacted sites (Rashleigh et al., 2009 and IUCN, 2020.1). Therefore, owing to the dominance of *E. anoplus* and the largely absent *E. sp. nov. 'South Africa'*, it may be assumed that the adjacent agricultural and/or mining impacts have already gradually degraded

the associated watercourse/s and as a result, the community composition has shifted slightly (Digby Wells Environmental, 2020).

8.8.6 Palaeontology

A Phase 1 palaeontology study was undertaken in 2020. This is a relatively new requirement, that was not in place at the time of the original application process. In the 2020 study no fossils were found during the site visit, but the sensitivity of the area is regarded as very high.

The rocks of the Karoo Supergroup are internationally acclaimed for their richness and diversity of fossils. The rocks of the Beaufort Group of South Africa cover approximately one-third of the land surface and have yielded an abundance of well-preserved therapsids and other tetrapods which have been used to subdivide this Group into eight faunal Assemblage Zones.

The Ecca Group, Vryheid Formation may contain fossils of diverse non-marine trace, Glossopteris flora, mesosaurid reptiles, palaeoniscid fish, marine invertebrates, insects, and crustaceans (Johnson 2009; in Fourie, 2020). Glossopteris trees rapidly colonised the large deltas along the northern margin of the Karoo Sea. Dead vegetation accumulated faster than it could decay, and thick accumulations of peat formed, which were ultimately converted to coal. It is only in the northern part of the Karoo Basin that the glossopterids and cordaitales, ferns, clubmosses and horsetails thrived (McCarthy and Rubidge 2005; in Fourie, 2020).

The Glossopteris flora is thought to have been the major contributor to the coal beds of the Ecca. These are found in Karoo-age rocks across Africa, South America, Antarctica, Australia and India. This was one of the early clues to the theory of a former unified Gondwana landmass (Norman and Whitfield 2006; in Fourie, 2020).

Trace fossils are relatively abundant in the shales occurring near the top of the Dwyka Group. Lycopods (Leptophloem australe) have been described from the northern Free State (Mac Rae 1999). Spores and acritarchs have been reported from the interglacial mudrocks of the Dwyka Group, also pollen, wood, and plant remains in the interbedded mudrocks as well as the diamictite itself, while anthropod trackways and fish trails are present in places on bedding planes (Visser et al. 1990; in Fourie, 2020).

One of the Pretoria Group formations in the development area may contain fossils. Nixon et al. (1988) (in Fourie, 2020) described the black shales south-west of Potchefstroom as consisting of overlapping laminated basal mounds which are stromatolitic as well as spheroidal possible planktonic fossil algae. These can range in size from 3.5 - 17 mm in height and up to 10 mm in diameter and can be present in the development area.

Fossils in South Africa mainly occur in rocks of sedimentary nature and not in rocks from igneous or metamorphic nature. Therefore, if there is the presence of Karoo Supergroup strata the palaeontological sensitivity is generally low to very high.

Table 18: Taken from Palaeotechnical Report (Groenewald 2012, in Fourie, 2020) (1cA)

Light grey course to fine grained sandstone and siltstone. Dark coloured siltstone due to presence of carbon enrichment and coal beds	Abundant plant fossils of Glossopteris and other plants. Trace fossils. The reptile Mesosaurus has been found in the southern part of the Karoo Basin

8.8.7 Cultural Heritage

A specialist study was undertaken in 2020 to provide an update on the cultural heritage baseline of the study area from 2012– see Appendix C for the 2012 report and Appendix E for the updated report. The cultural heritage baseline presented in this section is based on site observations collected during the 2020 field visit, which were focussed on Pit D and Pit H, as well as a review of relevant literature, the previous specialist study, available data sources such as The Heritage Atlas Database, various SAHRA databases, the

Environmental Potential Atlas, the Chief Surveyor General and the National Archives of South Africa, Aerial photographs and topocadastral and other maps. Note that since the proposed Phase 0 infrastructure is situated in an area currently under intensive agricultural cultivation (maize lands), no field survey for heritage features was considered necessary at that location.

8.8.7.1 Regional Context

The cultural landscape qualities of the region essentially consist of two components. The first is a rural area in which the human occupation is made up of a limited pre-colonial (Stone Age and Iron Age) occupation. The second component is a much later colonial (farmer) one, most of which developed during the last 150 years or less. Recently it gave rise to large-scale mining developments.

8.8.7.2 Baseline Update for Pit D and H

One of the earliest maps of the region dating to 1900, shows a region that is largely devoid of any development, with the most notable heritage feature being the old NZASM railway line from Pretoria to Lourenço Marques (Maputo). Official aerial photographs dating to 1958 indicate that development in the region largely consisted of agricultural fields, with some windbreaks planted in both pit areas, and built features located on the southern boundary of Pit D.

- During the site visit it was determined that all of these structures have been demolished and all re-cyclable material have been removed.
- Due to their relatively young age and current state of preservation, these features are viewed to have: Low significance 4C - Requires no further recording before destruction.
- A similar situation was found on the northern boundary of Pit H, where an old homestead was identified. Due to its relatively young age and current state of preservation, this feature is viewed to have: Low significance 4C - Requires no further recording before destruction

In summary, no sites of cultural significance were identified within the Pit D and Pit H study areas in the current study.

A chance find of a single Stone Age artefact was made during the 2020 field survey. The artefact, dating to the Middle Stone Age, was made from quartzite and was probably used as scraper, and identified as surface occurrence. Although occurrences of such tools in this part of the world is rare, as it is a surface find it is viewed not to be in its original context and is therefore classified as having low significance: Grade 4-C - no further action is required.

8.8.8 Visual Impact Assessment

A specialist study was undertaken in 2020 to provide an update on the visual baseline of the study area from 2012– see Appendix C for the 2012 report and Appendix E for the updated report. The visual baseline presented in this section is based on site observations collected during the field visit, as well as a study of Google Earth imagery and land cover data (GeoTerraImage, 2018). To determine the current visual resource value of the study area, the following factors were considered:

- Nature of vegetation cover with respects to overall appearance, density and height, and level of disturbance;
- General topography, including prominent or appealing landforms, and their spatial orientation relative to the project site;
- Nature and level of anthropogenic transformation or disturbance;
- Location, physical extent and appearance of water bodies; and

- The perceived level of compatibility of existing land uses.

8.8.8.1 Visual Resource Value of the Study Area

Visual resource value refers to the visual quality of elements of an environment, as well as the way in which combinations of elements in an environment appeal to our senses. Studies in perceptual psychology have shown an affinity for landscapes with a higher visual complexity, rather than homogeneous ones (Young, 2004, in Golder, 2020b). Furthermore, based on research of human visual preference (Crawford, 1994, in Golder 2020b), landscape quality increases when:

Prominent topographical features and rugged horizon lines exist;

- Water bodies such as streams or dams are present;
- Untransformed indigenous vegetation cover dominates; and
- Limited presence of human activity, or land uses that are not visually intrusive or dominant prevail.

Further to these factors, Table 19 indicates criteria used for visual resource assessment. The assessment combines visual quality attributes (views, sense of place and aesthetic appeal) with landscape character and gives the landscape a high, moderate or low visual resource value.

A review of the national web-based environmental impact assessment screening tool indicates that the site is not considered sensitive with regard to the visual resource. Nonetheless, it recommends that a visual impact assessment be conducted as part of the environmental assessment process.

Table 19: Visual resource value criteria

Visual Resource Value	Criteria
High (3)	Pristine or near-pristine condition/little to no visible human intervention visible/ characterised by highly scenic or attractive natural features, or cultural heritage sites with high historical or social value and visual appeal/ characterised by highly scenic or attractive features/areas that exhibit a strong positive character with valued features that combine to give the experience of unity, richness and harmony. These are landscapes that may be considered to be of particular importance to conserve and which may be sensitive to
Moderate (2)	Partially transformed or disturbed landscape/human intervention visible but does not dominate view, or is characterised by elements that have some socio-cultural or historic interest but that is not considered visually unique/ scenic appeal of landscape partially compromised/noticeable presence of incongruous elements/areas that exhibit positive character but which may have evidence of degradation/erosion of some features resulting in areas of more mixed character. These landscapes are less important to conserve but may include certain areas or features worthy of conservation.
Low (1)	Extensively transformed or disturbed landscape/human intervention is of visually intrusive nature and dominates available views/scenic appeal of landscape greatly compromised/visual prominence of widely disparate or incongruous land uses and activities/areas generally negative in character with few, if any, valued features. Scope for positive enhancement frequently occurs.

An analysis of the visual resource value of the study area vis-á-vis the tabulated factors is discussed below:

- **Topography**: The natural landscape is generally flat to undulating, with low-lying areas and elevated sites associated with wetlands and pans, and small hills, respectively. Natural topographical features are mostly unobtrusive and do not form visual landmarks. By contrast, the mining stockpiles are prominent features in the landscape, and generally contrast dramatically and negatively with the natural topographical aesthetic. Since the NLA (2012) study, additional and expanded mining operations in the study area have further negatively impacted the natural topography.
  - The topographic value of the study area therefore has a low value.
- **Hydrology**: Despite the presence of various rivers/streams, wetlands and pans in the study area and these being of at least some visual appeal, none are particularly visually prominent. They are thus not highly significant features within the overall visual context:
  - The visual resource value of the study area's hydrology is therefore considered to be moderate.
- **Vegetation cover**: Natural habitat across the majority of the study area has been transformed or severely modified by mining and agriculture. Stands of alien trees are present, and although they add a degree of 'natural' complexity to the landscape's visual character, they are listed as invasive and require removal:
  - The visual resource value of the study area's vegetation cover is therefore expected to be low;
- **Land use**: Mining, agriculture and, to a lesser extent power generation, are the prevailing and most visually prominent land uses across the majority of the study area. The facilities and infrastructure associated with these operations are optically intrusive and detract from the visual aesthetic of the landscape:
  - The visual resource value of the study area's land use is therefore considered to be low.

8.8.8.2 Comparison between 2012 and current visual resource

The major change that has occurred in the study area between 2012 and the present is the visible increase in mining activities. New mines have started operating and the transformation footprints of existing mines have expanded.

8.8.8.3 Summary

In summary, on all metrics the visual resource value of the study area is expected be low. The region has undergone additional alterations since 2012 because of mining, and this has further transformed the landscape from a rural farming setting to a complex, mining-dominated landscape that is, to a large extent, visually unappealing.

8.9 Socio-economic Context

A specialist opinion was compiled in 2020 to provide an update on the socio-economic baseline of the study area that was conducted in 2012 – see Appendix C for the 2012 report and Appendix E for the updated report. The socio-economic information presented in this section is based on a review of relevant literature, the previous specialist study, consultation with the New Largo community liaison team, and stakeholder engagement meetings held with affected farmers, and the Kendal Community members. The consolidated information was used to inform the re-evaluation of the impact assessment on the socio-economic context, with reference to Pit H and Pit D in particular (Appendix E).

8.9.1 Socio-economic features of MRA

Refer to Section 3.1.1 for a description of affected properties and landowners within the MRA and the immediately adjacent lands. Landowners, occupants, nearby communities and other groups relevant to the MRA are summarised in Table 20.

Table 20: Landowners, occupants, nearby communities, municipality, and other relevant groups

Group	Composition
Directly Affected Landowners, Businesses Lessees	Chicken farm adjacent to Pit D (Owned by Mr. J. Byrne). The chicken farm portion is planned to be mined in year 2; Service station (Owned by Mr JC van de Heever) - the garage will be affected by the relocation of the R545; Roos farm; and Truter farm.
Land Claimants	To be confirmed.
Local Government	Nkangala District Municipality Emalahleni Local Municipality Community, Safety, Security and Liaison
Neighbouring Communities	35 households in the Clay/Sand Community
Occupants on or Adjacent to Mining Right Land	One family on Roos Property; 35 households in the Clay/Sand Community; 35 households in the New Largo Village; and 8 Families on Annis van Rooyen property.
Primary Communities	New Largo community; Wilge community; Balmoral community; Kendal forest holdings; Kendal community; and Venter/clay community.
Secondary Communities	Witbank; Phola/Ogies; and Delmas.

8.9.2 Socio economic characteristics of EMalahleni Local Municipality

New Largo is located in the eMalahleni Local Municipality (ELM) in the jurisdictional area of Nkangala District Municipality (NDM) in Mpumalanga Province, South Africa. This section provides a summary of the social-economic environment of the ELM.

Nkangala District Municipality

From 2006 to 2016, the NDM had an average annual employment growth of 3.05%. The unemployment rate of ELM was 27.3% in 2011 and 26.6% in 2016, according to the 2011 census and 2016 IHS global insight figures.

Apart from the formal and informal sector as sources of income, other sources of income within the NDM include social services grants. Table 21 lists the grant types received by residents in ELM.

Table 21: Social services grant types in ELM and STLM (SASSA, 2017/2018)

Grant type	ELM
Old age	15 967
War veteran	0
Disability	5944
Foster child	2382
Care dependency	932
Child support	65 968
Grant in aid	650

In a growing economy among which production factors are increasing, most of the household incomes in NDM are spent on purchasing goods and services. It was estimated that in 2016 17.42% of all the households in the NDM, were living on R30, 000 or less per annum.

Economic profile

The NDM's economy is made up of various industries. In 2016, the mining sector was reported to be the largest within NDM accounting for R 41.1 billion (37.3%) of the total Gross Value Added in the district municipality's economy. Figure shows the 2011 and 2016 industry contribution to the GDP at basic prices.

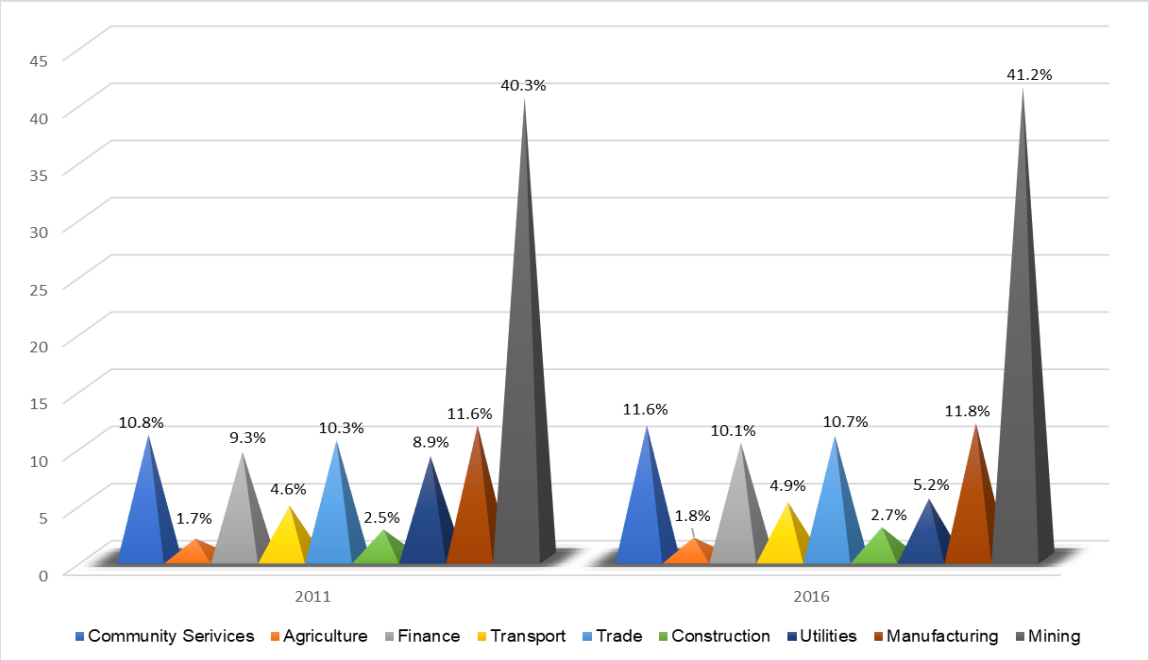

Figure 36: Industry contribution to GDP at basic prices in NDM, 2011 and 2016.

In 2015, the ELM contributed 20.9% to the Mpumalanga Province. From 1996 to 2015, ELM demonstrated an average annual economic growth of 2.4%.

eMalahleni Local Municipality

The ELM is located to the North-west of the Mpumalanga Province, and it covers an area of about 2677.67 square kilometres. Some of the major towns and settlements near New Largo include Phola and Ogies. This baseline only highlights the socio-economic conditions for the broader ELM because information pertaining to the towns and settlements is limited.

Population

ELM accounts for the largest population within the NDM, with an estimate of 455 228 people. Table 22 depicts the population trends of ELM from 2011 to 2016 and the 2030 projected population. From 2011 to 2016, the population of ELM has increased by 3.2%.

Table 22: Population trends of ELM

Year	Population
2011 (Census)	395 466
2016 (Community Survey)	455 228
2030	707 530

The increase in population in ELM might be due to the growth of mining industries and businesses around the area. The population growth has the following adverse impacts:

- Informal settlements and back rooms;
- Strain on water, sanitation, electricity, and roads resulting in quality and capacity problems; and
- Increase in unemployment, particularly amongst youth and unskilled, which might impact on issues of crime, prostitution, drug abuse.

The total number of households in ELM has increased over the years. In 2011, a total of 119 874 households were respectively reported in ELM. In 2016, the number of households has increased to 150 420 in ELM.

Gender and Age Distribution

The age and gender structure of the population is a key determination of population change and dynamics. The male gender in ELM constitutes approximately 53% of the total population, while the female gender constitutes 47%. This trend can often be observed in mining towns where the mining industry is predominantly male orientated. Most people in ELM (43.1%) are in the 15-34 age group.

Ethnicity and Language

The population distribution of the ELM composes of all racial groups, with over 65% of the population belong to the Black African group, and the most spoken language is Isizulu and Southern Ndebele. The dominant home language in the ELM is isiZulu (42.4%), followed by Afrikaans (14.6%), Sepedi (12.5%) and isiNdebele (10%).

Education

Statistics South Africa Community Survey shows that the population in ELM aged 20+ completed grade 12, increased from 117 021 in 2011 to 146 952 (an increase of 29 931) in 2016, an increase of 25.6% in the relevant period.

Employment

In 2011, 138 548 people in ELM were employed either by the formal and informal sector. According to the 2016 IHS Global Insight figures, the unemployment rate of ELM is 26.6%.

Apart from the formal and informal sector as the channels for sourcing income, other sources of income within the ELM include social services grants. In a growing economy among which production factors are increasing, most of the household incomes in NDM are spent on purchasing goods and services. Therefore, the measuring of the income and expenditure of households is a major indicator of economic trends.

Key Economic Activities

In 2015, the ELM contributed 20.9% to the Mpumalanga economy. From 1996 to 2015, ELM demonstrated an average annual economic growth of 2.4%. The sectors contributing to the economic activities in ELM, consequently contributing to the economy of NDM, are highlighted further in the next sections:

Agriculture

Agriculture in ELM includes commercial-scale crop and livestock production, and low-level subsistence farming, producing enough maize for personal use, traditional livestock farming and sorghum production, which is formalised and produced for the market. Wool production is one of the upcoming sources of income in the area for emerging communal farmers.

Mining

Mining in ELM is a very significant economic sector, but it has also become a major spatial development constraint due to shallow undermining, especially in the central, northern, and southern portions of Witbank town.

Industries

There are various industrial areas in the ELM, most of which are situated within or around Witbank town.

Business Activities

The project area is close to the town of Ogies with the highest maize production in the Maize Triangle and hosts the AFGRI Co-operation. The Ogies station handles a substantial portion of the country's freight. The town also functions as a service centre to farmers, with a number of service industries and the co-operative focusing specifically on the agricultural sector. The township of Phola (meaning desert) is located north of Ogies, and there is a vast distance between these two settlements.

Kendal Power station was completed between 1971 and 1982 and is currently the largest coal-fired power station in the world. The power station makes a significant contribution to the economy of Ogies and Phola and receives its coal from the adjacent Khutala mine. Most of the residents of Ogies and Phola are employed at the power station and the mine. Undermining, however, poses constraints to the development of these settlements.

Ogies has developed in a linear pattern along two main roads, namely the P29-1 and adjacent railway line as well as the R545. The general maintenance of the public spaces (road reserves, open spaces, roads etc.) in the town is very poor and requires attention. Witbank CBD represents the largest concentration of business activity in ELM. The urban areas in ELM are mainly residential with supportive services such as business and social facilities.

Tourism

ELM is the point of entry into Mpumalanga from Gauteng. The province of Mpumalanga has unique scenery. It is also a home to many world-renowned attractions, including the famous Kruger Park and many others. Also, Mpumalanga is the only province of South Africa to border two provinces of Mozambique or to border all four districts of Swaziland. Unfortunately, tourism potential in the two municipalities is not fully exploited

9.0 ENVIRONMENTAL IMPACT ASSESSMENT

The following sections present the assessment of impacts of the New Largo Coal mine on the various physical, biological, social and economic, and cultural and heritage resources within the MRA.

9.1 Project phases and activities

Impacts have been identified for the following phases (where applicable):

- Construction Phase (including planning, design and pre-construction)
- Operational Phase
- Decommissioning and Closure Phase
- Post Closure

The main project activities, for assessment in the impact assessment and management in the EMP, can be categorised as follows:

- All Activities
- Earthworks and Soil Management
- Mining Activities
- Coal Processing and Coal Discard Management
- Materials Handling and Transport
- Supporting Infrastructure
- Water Management
- Waste Management (Non-Mineralogical)
- Rehabilitation
- R545 Road Deviation

Further details on the project activities assessed are described in Section 3.0.

9.2 Summary of specialist studies

A summary of the specialist studies are presented below in Table 23.

Table 23: Summary of specialist reports

List of studies undertaken in 2012	List of studies undertaken in 2020
Soils	Soils
Air Quality	Air Quality
Noise	Noise
Groundwater	Groundwater
	Geochemistry assessment
Surface Water and Water Use License	Surface Water
Ecology and Biodiversity (including Natural Vegetation and Animal Life)	Aquatic Ecology
	Terrestrial Ecology
Wetland Delineation and Impact Assessment	Wetlands Ecology
Visual Aspects	Visual
Social and economic	Socio-economic
	Palaeontology

List of studies undertaken in 2012	List of studies undertaken in 2020
Heritage Resources	Cultural heritage
Traffic Impact Assessment	Traffic
Vibrations and Blasting	
Agricultural and Land Use Potential	
Land Capability	
End Land Use Potential	
Strategy for Development of a Wetland Offset Plan	

9.3 Impact assessment Methodology

The significance of identified impacts will be determined using the approach outlined below (terminology from the Department of Environmental Affairs and Tourism Guideline document on EIA Regulations, April 1998). This approach incorporates two aspects for assessing the potential significance of impacts, namely occurrence and severity, which are further subdivided as follows:

Occurrence		Severity	
Probability of occurrence	Duration of occurrence	Scale/extent of impact	Magnitude of impact

The following five ranking scales are used to assess the magnitude and duration of impacts:

Magnitude	Duration
10 - Very high/unknown	5 - Permanent (>10 years)
8 – High	4 - Long-term (7 - 10 years, impact ceases after site closure has been obtained)
6 – Moderate	3 - Medium-term (3 months- 7 years, impact ceases after the operational life of the activity)
4 – Low	2 - Short-term (0 - 3 months, impact ceases after the construction phase)
2 – Minor	1 - Immediate
Scale	**Probability**
5 - International	5 - Definite/Unknown
4 – National	4 - Highly Probable
3 – Regional	3 - Medium Probability
2 – Local	2 - Low Probability
1 - Site Only	1 - Improbable
0 – None	0 - None

Once these factors are ranked for each impact, the significance of the two aspects, occurrence and severity, is assessed using the following formula:

Significance Points= (Magnitude + Duration + Scale) x Probability.

The maximum value is 100 significance points (SP). The impact significance will then be rated as follows:

Points	Significance	Description
SP > 60	High environmental significance	An impact which could influence the decision about whether or not to proceed with the project regardless of any possible mitigation.
SP 30 - 60	Moderate environmental significance	An impact or benefit which is sufficiently important to require management, and which could have an influence on the decision unless it is mitigated.
SP < 30	Low environmental significance	Impacts with little real effect and which will not have an influence on or require modification of the project design.
+	Positive impact	An impact that is likely to result in positive consequences/effects.

For the methodology outlined above, the following definitions were used:

- Magnitude is a measure of the degree of change in a measurement or analysis (e.g., the area of pasture or the concentration of a metal in water compared to the water quality guideline value for the metal), and is classified as none/negligible, low, moderate or high. The categorisation of the impact magnitude may be based on a set of criteria (e.g. health risk levels, ecological concepts and professional judgement) pertinent to each of the discipline areas and key questions analysed. The specialist study must attempt to quantify the magnitude and outline the rationale used. Appropriate, widely recognised standards are to be used as a measure of the level of impact;
- Scale/Geographic extent refers to the area that could be affected by the impact and is classified as site, local, regional, national, or international;
- Duration refers to the length of time over which an environmental impact may occur i.e. immediate/transient, short-term (0 to 7 years), medium-term (8 to 15 years), long-term (greater than 15 years with impact ceasing after closure of the project), or permanent; and
- Probability of occurrence is a description of the probability of the impact actually occurring as improbable (less than 5% chance), low probability (5% to 40% chance), medium probability (40% to 60% chance), highly probable (most likely, 60% to 90% chance) or definite (impact will definitely occur).

9.4 Assessment of impacts and formulation of mitigation measures

To allow for direct comparisons of the impacts between the two assessments (2012 and 2020), the 2012 impacts have been re-ranked appropriately in alignment with the 2020 impact assessment methodology (Appendix F). The impacts for each specialist study are detailed below and further appended in Appendix E.

9.4.1 Soil, Land Capability and Land Use

The impacts which were identified as part of the initial authorisation includes the following (ESS, 2012):

9.4.1.1 2012 Impact Assessment

Construction Phase

The impacts which were identified as part of the initial authorisation includes the following (ESS, 2012):

- Soil stripping (150mm to 500mm)
- Modification of large parts of the infrastructure area as a result of agricultural activities which includes rain-fed crops and pivot irrigated fields (Pit H).
- Soil irrigation through irrigation pivots at Pit H area which comprises of five (**5**) pivots.
- **Although commercial mining of sand and clay were identified within or near the entire New Largo mining rights area, these was not applicable at Pit H and Pit D areas**.
- Modification of drainage within existing wetlands environments due to cultivation was more profound at Pit H area.
- Soil exposure after cultivation resulting in dust generation and erosion (wind and water) was identified.
- Erosion of soil as a result of vegetation removal was also identified.
- Soil contamination and possible loss of land capability resulting from farming activities and mining activities were identified.
- Soil compaction as a result of selected areas used for commercial or private dwellings was also identified.
- The loss of soil water as a result of soil profile disturbance.

Operational Phase

- Soil sterilisation in areas where coal is mined and supporting facilities are constructed.
- Loss of stockpiled soil due to erosion (wind and water) and sterilisation of local streams and waterways.
- Compaction of stockpiled soils and possible loss of utilisable soils from the system.
- Soil contamination from impacted run-off or spillage of hydrocarbons, hauling coal and blasting residue.
- Soil contamination as a result of emission fall-out and dust suppression from already impacted water.

Decommissioning and Closure Phase

- Loss of soil organic carbon and nutrients as a result of leaching during stockpiling.
- Erosion and de-oxygenation during stockpiling.
- Soil compaction and dust generation as result of heavy machinery mobilisation during rehabilitation.
- Soil contamination as a result of emission fall-out and dust suppression from already impacted water.
- Soil contamination from impacted run-off or spillage of hydrocarbons, hauling coal and blasting residue.
- Re-instatement of soil in disturbed areas (Positive impact).

9.4.1.2 2020 Impact Assessment

The main changes to the authorised infrastructure from a soil, land capability and land use perspective is the trucking of coal from both pits and addition of mine support infrastructure such as pollution control dams, de-stoning plant and access roads at Pit H. The magnitude of impacts listed below will likely increase as result of the modified infrastructure at Pit H.

Construction Phase

- Soil sterilisation due to placement of infrastructure, including the destoning plant, at Pit H.

Operational Phase

- The contamination of soils as a result of dust distribution and fallout on the trucking routes and use of impacted water for dust suppression.

9.4.2 Air Quality

9.4.2.1 2012 Impact Assessment

The 2012 impacts are detailed below.

Construction Phase

- Unmitigated construction activities were predicted to be a **low** environmental significance regarding dust fallout impacts at the sensitive receptor without mitigation. With the implementation of suitable dust mitigation measures (i.e. wet suppression), the residual impacts are anticipated to remain with a **low** environmental significance at nearby sensitive receptors';
- There will be a **low** environmental significance regarding PM_{10} impacts at the sensitive receptors. With the implementation of suitable mitigation measures, the residual impacts are anticipated to remain with a **low** environmental significance at nearby sensitive receptors.

Operational Phase

- There will be a **moderate** (i.e. exceedance of the NAAQS) environmental significance regarding unmitigated PM_{10} impacts at Kendal Forest Holdings, Phola and Wilge due to vehicle entrainment on the unpaved haul roads. With the implementation of mitigation measures (assumed 90% control efficiency on unpaved haul roads due to the application of chemical suppressants) the residual impacts are anticipated to be **low** (i.e. within NAAQS) at Kendal Forest Holdings, Phola and Wilge;
- Based on assumptions of elevated baseline PM_{10} concentrations within the region, there will be a **moderate** cumulative environmental significance regarding the predicted PM_{10} at the sensitive receptors of Kendal Forest Holdings, Phola and Wilge;
- There will be a **low** environmental significance regarding dust fallout from the conveyor operations which are predicted to be within the residential standard of 600 mg/m²/day at the closest sensitive receptors of Wilge and Phola;
- There will be a **moderate** (i.e. exceedance of the NAAQS) environmental significance regarding unmitigated $PM_{2.5}$ at the sensitive receptors of Kendal Forest Holdings and Phola due to vehicle entrainment on the unpaved haul roads. With mitigation measures (assumed 90% control efficiency on unpaved haul roads due to the application of chemical suppressants) the predicted $PM_{2.5}$ concentrations are anticipated to have a **low** environmental significance (I.e. within NAAQS) at Kendal Forest Holdings, Phola and Wilge"; and
- Air quality management measures must be implemented to reduce the impacts to within acceptable levels.

Decommissioning and Closure phase

- Detailed assessment was not undertaken for the decommissioning and post closure phase impacts other than Airshed recommending that general measures as provided in the report be implemented.

9.4.2.2 2020 Impact Assessment

The mining of Pit H and Pit D were assessed in the original 2012 air quality impact assessment. The only changes relevant to the 2020 assessment include:

Construction Phase

- Construction of a larger infrastructure footprint and the destoning plant adjacent to Pit H and not in-pit. As the cumulative infrastructure footprint is larger, the associated dust and PM_{10} impacts need to be reassessed;
- In the original 2012 study, it was assumed that by the time the mining would occur at Pit H, the existing main mine infrastructure would have been in place and could have been used for Pit H and D. With the changed mine schedule and infrastructure layout plan, this assumption is no longer valid and thus the impacts need to be re-assessed;
- The original mine plan and Environmental Management Plan (EMP) assumed that a conveyor belt was going to be constructed. Under the 2020 mine schedule and infrastructure layout, the conveyor had been removed and replaced with trucking of coal offsite along existing roads; and
- The only “new” significant sensitive receptor identified is the informal settlement behind Vlakfontein mine and adjacent to the R545. This community originated from the old farm workers accommodations pre 2012 and has subsequently become an informal settlement over the last eight years.

Based on the change in the mine schedule and infrastructure layout is our opinion that:

- There will be a **low** environmental significance regarding dust fallout and PM_{10} concentration levels and dust fallout associated with the increased infrastructure footprint, destoning plant and trucking route construction activities at nearby sensitive receptors;
- With the implementation of suitable mitigation measures (i.e. wet suppression), the residual impacts are anticipated to remain with a **low** environmental significance at nearby sensitive receptors; and
- It is anticipated that there will be no material change in the cumulative construction impacts as identified in 2012. Additional proposed mitigation measures will be applicable to the destoning plant.

Operational Phase

Based on the change in the mine schedule and infrastructure layout it is our opinion that:

- There will be a **moderate** environmental significance regarding PM_{10} concentration levels and dust fallout associated with the trucking of coal on the unpaved gravel roads. With the implementation of suitable mitigation measures (i.e. wet suppression), the residual impacts are anticipated to be of a **low** environmental significance;
- The de-stoning plant is anticipated to make a **moderate** contribution to the PM_{10} concentration and dust fallout levels at nearby sensitive receptors. With the implementation of suitable mitigation measures (i.e. surrounding the plant with berms, mist dust suppression systems), the residual impacts are anticipated to be of a **low** environmental significance;
- The operation of the offloading facility and conveyor connection adjacent to Kusile (Phase 0) could be a source of additional dust; however, although the amount of dust being generated may increase, the area where the facilities will be developed are currently under maize, and any dust being generated will be suppressed via mist suppression systems. The Phase 0 infrastructure is therefore expected to have an impact of low environmental significance, and no further mitigation is proposed.

- There will be a **moderate** impact regarding Greenhouse Gas (GHG) emissions released from the project associated with the trucking of coal compared to the conveying of coal due to the dramatic increase in hydrocarbon fuel usage onsite which will increase the operations cumulative carbon footprint;
- It is anticipated that there will be a material change in the operational phase impacts for Pit D and Pit H compared to those assessed in 2012 due to the changed mine schedule and infrastructure layout plan. Additional mitigation measures, relating to the trucking of coal, the destoning plant, and the generation of GHG's are required in addition to those proposed in the 2012 study.

Decommissioning and Closure Phase

Based on the change in the infrastructure layout and increased project footprint size it is our opinion that:

- There will be a **low** environmental significance regarding dust fallout and PM_{10} concentration levels associated with decommissioning and closure activities; and
- With the implementation of suitable mitigation measures during the decommissioning and closure activities, only post closure impacts are anticipated.
- It is anticipated that there will be no material change in the cumulative construction impacts as identified in 2012 and thus there is no requirement to change the proposed mitigation measures. The 2012 proposed mitigation measures will need to be implemented to maintain the impacts at nearby sensitive receptors to within an acceptable level.

9.4.3 Traffic

The current (2020) traffic demand was determined in the context of level of services (LOS); which is a measure of effectiveness for two-lane highways that is based on follower density; i.e. the number of vehicles in platoons per kilometre. LOS A represents the best operating conditions, whilst LOS F represents the worst. Capacity is indicated by LOS E. The results of the capacity and operational analyses for the existing 2020 scenario shows good service levels, LOS A to LOS C, for all the cross sections in 2020; therefore, since the predicted traffic impact as a result of the New Largo trucking contribution to the existing peak hour situation is expected to be of a low significance prior to mitigation, no mitigation measures are thus required as a result of the New Largo trucking contribution to the existing peak hour situation.

The results of the capacity and operational analyses for the future 2030 scenario show acceptable service levels for all the road sections. Good service levels, LOS A to C, are expected for most of the cross sections while LOS D is expected on Sections AI (R545 from the intersection with R686 in the north to the interchange with the N12 in the south) and AB (R686 from the intersection with R545 to the main access to the Kusile Power Station) during the weekday morning peak hour in 2030. Although LOS D is still acceptable, it shows that capacity upgrading will be required shortly after year 2030; however no mitigation measures are required by the applicant from a capacity and operational point of view, since the impact on traffic that will be generated by the New Largo project in the future 2030 scenario was also assessed as being of low significance.

9.4.4 Noise

9.4.4.1 2012 Impact Assessment

The 2012 impacts are outlined below.

Construction Phase:

- There will be a **low** environmental significance regarding an increase in the baseline noise levels associated with the construction of the Phola-Kusile Coal Conveyor at the nearby sensitive receptors in close proximity to the conveyor corridor. The construction activities will not remain static and will progress

along the corridor and thus with the implementation of suitable mitigation measures, the residual impacts are anticipated to be of a **low** environmental significance;

- There will be a **low** environmental significance regarding an increase in the baseline noise levels associated with land clearing and general construction activities for the New Largo operations. The construction activities will be for a defined period of time and transient in nature and thus with the implementation of suitable mitigation measures, the residual impacts are anticipated to be of a **low** environmental significance;
- There will be a **low** environmental significance regarding an increase in the baseline noise levels associated with road construction activities and relocation of the R545 road at the nearby sensitive receptors in close proximity to the transport corridors. The construction activities will not remain static and will progress along the corridor and thus with the implementation of suitable mitigation measures, the residual impacts are anticipated to be of a **low** environmental significance; and
- Noise management measures must be implemented to reduce the impacts to within acceptable levels.

Operational Phase:

- There will be a **low** environmental significance regarding an increase in the baseline noise levels associated with the haul roads and relocated R545 road. Impacts are likely to be experienced within a few hundred meters of the transport corridors and thus the residual impacts are likely to maintain with a **low** environmental significance even with the implementation of suitable mitigation measures onsite.
- There will be a **moderate** environmental significance regarding an increase in the baseline noise levels associated with the static mining plant infrastructure at the nearby sensitive receptors. With the implementation of suitable mitigation measures, the residual impacts are anticipated to be of a **low** environmental significance;
- There will be a **moderate** environmental significance regarding an increase in the baseline noise levels associated with the open cast mining at the nearby sensitive receptors. The impact of the roaming open cast operation in the MRA will only be located at one position at one time and will shift as the mining front shifts. With the implementation of suitable mitigation measures, the residual impacts are anticipated to remain with a **moderate** environmental significance although the impacts will be restricted to within a close proximity of the mining front;
- There will be a **moderate** environmental significance regarding an increase in the baseline noise levels associated with blasting operations in the MRA at the nearby sensitive receptors. Blasting will occur at frequent intervals throughout the mining operations. The residual impacts are anticipated to remain of a **moderate** environmental significance even with the implementation of suitable mitigation measures; and
- Noise management measures must be implemented to reduce the impacts to within acceptable levels.

Decommissioning and Post Closure Phase

- Detailed assessment was not undertaken for the decommissioning and post closure phase impacts.

The 2020 impacts are presented below.

9.4.4.2 2020 Impact Assessment

Construction Phase

From a construction perspective, the mining of Pit H and Pit D were assessed in the original 2012 noise impact assessment. The only changes relevant to the 2020 assessment include:

- Construction of a larger infrastructure footprint and the destoning plant adjacent to Pit H and not in-pit. As the cumulative infrastructure footprint is larger, the associated noise impacts need to be reassessed;
- In the original 2012 study, it was assumed that by the time the mining would occur at Pit H, the existing main mine infrastructure would have been in place and could have been used for Pit H and D. With the changed mine schedule and infrastructure layout plan, this assumption is no longer valid and thus the impacts need to be re-assessed;
- The original mine plan and Environmental Management Plan (EMP) assumed that a conveyor belt was going to be constructed. Under the 2020 mine schedule and infrastructure layout, the conveyor had been removed and replaced with trucking of coal offsite along existing roads; and
- The only “new” significant sensitive receptor identified is the informal settlement behind Vlakfontein mine and adjacent to the R545. This community originated from the old farm workers accommodations pre 2012 and has subsequently become an informal settlement over the last eight years.

Based on the change in the mine schedule and infrastructure layout is our opinion that :

- There will be a **low** environmental significance regarding an increase in the baseline noise levels at the nearby sensitive receptors associated with the construction of the new haul roads. The construction activities will not remain static and will progress along the corridor and thus with the implementation of suitable mitigation measures, the residual impacts are anticipated to be of a **low** environmental significance;
- There will be a **low** environmental significance regarding an increase in the baseline noise levels associated with the earthworks and heavy machinery operation at the Pit D during the construction phase, as the construction period will be brief in duration and the associated noise can be mitigated with suitable mitigation measures. The residual impacts are anticipated to remain with a **low** environmental significance;
- There will be a **low** environmental significance regarding an increase in the baseline noise levels associated with the construction of Pit H and associated infrastructure including the destoning plant as the construction period will be brief in duration and the associated noise can be mitigated with suitable mitigation measures. With the implementation of suitable mitigation measures, the residual impacts are anticipated to remain with a **low** environmental significance; and
- It is anticipated that there will be nominal changes in the cumulative construction impacts as identified in 2012 and thus there is no requirement to change the proposed 2012 mitigation measures.

Operational Phase

Based on the change in the mine schedule and infrastructure layout is our opinion that:

- There will be a **moderate** environmental significance regarding an increase in the baseline noise levels associated with the hauling of coal offsite at the nearby sensitive receptors along the road corridor. Impacts are likely to be experienced within a few hundred meters of the corridor. Due to the number of anticipated trips per day, the residual impacts are anticipated to remain of a **moderate** environmental significance even with the implementation of suitable mitigation measures;
- There will be a **moderate** environmental significance regarding an increase in the baseline noise levels associated with Pit H associated surface infrastructure including the destoning plant which is anticipated to be a significant local noise source. With the implementation of suitable mitigation measures, the residual impacts are anticipated to be of a **low** environmental significance;

- There will be a **low** environmental significance regarding an increase in the baseline noise levels associated with mining Pit D. With the implementation of suitable mitigation measures, the residual impacts are anticipated to remain with a **low** environmental significance; and
- It is anticipated that there will be nominal changes in the cumulative operational impacts as identified in 2012 and thus there is no requirement to change the proposed 2012 mitigation measures except that suitable mitigation measures must be implemented along the trucking routes and at the Pit H destoning plant in addition to those recommended in 2012.

Decommissioning and Closure Phase

Decommissioning impacts are anticipated to be very similar to construction impacts and are likely to include the following activities:

- Removal of infrastructure and concrete foundations;
- Material handling activities and transport of recovered material offsite; and
- Backfilling, capping, closure and rehabilitation activities for disturbed areas.

Such activities are likely to generate elevated noise levels in close proximity to nearby sensitive receptors. The impacts are however anticipated to cease almost immediately following the cessation of the decommissioning and closure activities onsite. Based on the change in the mine schedule and infrastructure layout is our opinion that:

- There will be a **low** environmental significance regarding an increase in the baseline noise levels associated with decommissioning, rehabilitation and closure activities for Pit D and the associated infrastructure. With the implementation of suitable mitigation measures, the residual impacts are anticipated to be of a **low** environmental significance; and
- There will be a **moderate** environmental significance regarding an increase in the baseline noise levels associated with decommissioning, rehabilitation and closure activities for Pit H and the associated infrastructure (Note: Pit H impacts are anticipated to be higher than Pit D as Pit H has significantly more infrastructure to decommission). With the implementation of suitable mitigation measures, the residual impacts are anticipated to be of a **low** environmental significance; and
- It is anticipated that there will be marginal changes in the cumulative decommissioning and closure phase noise impact levels as identified in 2012 and thus there is no requirement to change the proposed mitigation measures.

9.4.5 Groundwater

9.4.5.1 2012 Impact Assessment

The key 2012 impact assessment findings are summarised as:

Construction Phase

- Opencast mining will start with the construction of a box-cut (regarded as part of construction). Box-cut construction activities will penetrate saturated aquifers, causing a localised cone of groundwater depression and depletion around the mining activity. The area of impact is expected to be not more than 250m;
- Groundwater seeping into the open void will be in contact with carbonaceous material;
- An increase in suspended solids will take place;

- Groundwater and rainwater falling into the pit will deteriorate if not pumped from the pit.

Operational Phase

- Increased groundwater recharge
  - Opencast mining activities will create areas that are open; areas filled with spoils, and rehabilitated areas;
  - Groundwater recharge from surface will increase from the normal 1 to 3% of mean annual precipitation (MAP), to an increased percentage, depending on the nature of the area. In the active void up to 100% of rainfall will accrue. The increase in recharge for spoils and rehabilitated areas will vary between 14% and 30% of MAP
- Impact on groundwater flow
  - Water accumulated in the old underground workings will be dewatered during the operational phase. This will reduce the impact of current inter-mine flow to zero, since the source will be removed completely.
  - No inter-mine flow is expected to take place.
  - New mining activities will create increased water make. This water will be pumped to the WTP for treatment prior to release.
  - All opencast sections (voids and spoils) will be managed as dry as practically possible.
  - Stage curve investigations have indicated that very little storage is available in-pit. For this reason the mine will be operated on a dry basis, meaning that all excess water will be treated and released.
  - The release of treated water will be based on the outcome of the Reserve Determination (study in progress.
- Impact on external groundwater users
  - Opencast pits will penetrate saturated aquifers, causing a localised cone of groundwater depression and depletion around the mining activity. The zone of aquifer depletion will increase and move as mining progresses and move according to the mine plan sequencing.
  - The maximum extent of depletion is expected to be 250 m around the pit perimeter.
- Loss of stream base flow
  - The formation of a cone of depression that increases over time will lead to a reversal of groundwater base flow. Instead of discharging into river systems, groundwater flow will be partially reversed. Groundwater flow will take place towards the open pits. The impacts and volumes are quantified through groundwater models and calculations in the Groundwater Specialist Impact Assessment (Appendix C).
- Deterioration in groundwater quality in the opencast pit
  - Ingress of groundwater and rainwater into opencast voids, spoils and rehabilitated sections of New Largo Colliery.
  - Acidification of sections of spoiled material will lead to deterioration in groundwater quality over time. Continuous aeration of unsaturated spoils will contribute to salt loads.

- In addition to this approximately 100 Million tonnes (Mt) of coal discard will be placed in parts of the pit. Although a direct groundwater related impact, this will mean that very little on-surface discard dumping will be required.
- Provision has been made for a temporary ~10 Mt on-surface storage facility. The on-surface discard facility will be located in a previously mined and backfilled area where seepage will be captured as part of the overall system to pump impacted water to the WTP for treatment before release to streams. Material stored on this facility will be backfilled into the mine pit.
- The expected groundwater quality at New Largo Colliery will consist of a mix of 5 different groundwater quality types as discussed in the 2012 ground water impact assessment (Appendix C); these quantities and qualities were incorporated in the Water Balance and Salt Balance.

- Impact on groundwater quality due to the operation of surface facilities
  - Potential deterioration of groundwater resources due to surface infrastructure including the Northern Tip and associated infrastructure; the Southern Tip and associated infrastructure; raw stockpiles at the Plant area; product stockpiles at the Plant area; a series of pollution control dams at the tips, coal stock piles, main mine water control dams and the decant point; the temporary WTP; the permanent WTP; the 10 Mt discard dump on surface.
  - All impacted water to be pumped to the WTP for treatment prior to release

Decommissioning and Closure Phase

- Decant and inter-mine flow from New Largo Colliery
  - All pits will be mined out and rehabilitated at this stage.
  - All excess water (~24 Mℓ/day) will be pumped to the WTP
  - All rehabilitated opencast sections will be managed as dry as practically possible.
  - Stage curve investigations have indicated that very little storage is available in-pit. For this reason the mine will be operated on a dry basis even post closure, meaning that all excess water will be treated to catchment qualities.
  - The treated water will be released according to the Reserve Determination recommendations. The current base case is to release water to river systems. Any changes to the base case will require an amendment to the IWULA and formal approval by the DWA).
  - No inter-mine flow will take place from New Largo Colliery to surrounding mining sections (current and future.

- Deterioration of in-pit water quality and residual pollution from surface infrastructure
  - Continuous ingress of groundwater and rainwater into rehabilitated sections of New Largo Colliery.
  - Acidification of sections of spoiled material will lead to the deterioration of groundwater quality over time.
  - Continuous aeration of unsaturated spoils will contribute to salt loads.
  - All contaminated water to be pumped to the WTP.
  - The treated water will be released according to a Reserve Determination update at the time of closure

9.4.5.1 2020 Impact Assessment

Construction Phase

From a construction perspective, the impacts associated with the establishment of Pit H and Pit D were assessed in the original 2012 groundwater impact assessment. The only changes relevant to the 2020 assessment include:

- The construction of the Phase 0 infrastructure, which will have a borehole supplying back-up water, to supplement/replace the Eskom water supply, if needed; however, since the potential construction phase impacts on groundwater quantity and quality in the MRA as a result of obtaining water for construction from three boreholes drilled into the old New Largo Colliery underground workings was assessed in the original 2012 groundwater impact assessment and no further mitigation is proposed for the current EMP amendment.

Operational Phase

The following impacts have been identified in the groundwater impact assessment (Appendix E);

- Mining through the barrier pillar at Pit D will result in increased volume of excess mine water that will need to be managed as part of the operational phase water balance.
- Mining through the barrier pillar at Pit D will result in an increase in mass load to groundwater quality, as a result of increased mine water ingress into Pit D, which should be managed and treated.
- The Pit H northern perimeter straddles the east-west aligned sub-catchment divide, therefore continued upgradient groundwater inflow to the pit is also going to be negligible once mining has progressed in a generally down-gradient (southerly and easterly) direction as indicated by the latest mine plan. The pit spoils and rehabilitated areas behind the active box-cut will, however, increasingly receive direct recharge which will migrate through the spoils towards the active box cut and will need to be dewatered via a sump or possibly multiple sumps. This direct recharge has been included in the Pit H mine pit water balance calculations (Appendix E).
- Backfilling of reject material from destoning plant at Pit H.

Based on the findings of the geochemical impact assessment (Appendix E), the following impacts have been identified:

- There is no material change in the geochemical impact of Pit D as a result of the proposed changes in mining schedule or mine plan.
- The backfilling of reject material from the destoning plant into Pit H as part of the rehabilitation plan is unlikely to change the Pit H mine water quality previously identified by JMA (2012) (Appendix C).
- Impacts on mine water quality will be managed through the below listed actions, as per the 2012 EMP:
  - Decreasing seepage post-closure through the use of a cover over the rehabilitated pit (cover design to be developed nearer to pit closure when rehabilitated pit final landform is available);
  - Interception of pit water to prevent decant; and
  - Treatment of intercepted pit water.
- The Pit H spoils (which will affect the chemistry of mine water removed from the pit for management and the PCD water quality) are assessed as **Type 3 waste** and classified as **hazardous** (environment); and

- Reject material from the De-stoning Plant (which represents the in-pit discard disposal) is assessed as **Type 3 waste** and classified as **hazardous** (human health and environment).

Decommissioning and Closure Phase

The potential impacts on the groundwater resource as a result of the mining of Pit H and Pit D, and decommissioning of supporting infrastructure in the northern region of the MRA (Phase 0), are largely covered in the original 2012 impact assessment.

- Additional impacts identified from the recent groundwater model update (Delta H, 2019), which incorporated the potential impacts of the Pit D extension. The model indicates a total predicted post closure decant rate of around 3.71 ML/d (1 352 917 m^3/a) at several decant locations, generally located at the edge of the backfilled areas next to pre-mining drainage courses and associated wetlands, i.e. topographic lows. Any water decanting at the edge of the backfilled areas might pond at these locations, form surface run-off or re-infiltrate into the ground; however, predicted decant rates should be revisited once a post-closure elevation model becomes available.
- At Pit H, the pit spoils and rehabilitated areas behind the active box-cut will increasingly receive direct recharge which will migrate through the spoils towards the active box cut and will need to be dewatered via a sump or possibly multiple sumps. This direct recharge has been included in the Pit H mine pit water balance calculations (Appendix E).

9.4.6 Surface Water

9.4.6.1 2012 Impact Assessment

The key 2012 impact assessment findings are summarised as:

- Destruction of water courses as mining progresses.
- Dirty water catchment area from the coal handling infrastructure including the coal processing plant, dragline, tertiary crushing plant, tips, ROM stockpiles, discard dumps, ramps, haul roads, workshops, offices, and stockyard areas.
- Spillage of coal during transportation via haul roads.
- Dust and fire suppression with treated water.
- The discharge of clean, treated water into the river system.

Construction Phase

- Contamination of water resources during the following activities:
  - Stripping of topsoil and civil works activities, resulting in disturbance and erosion, with sedimentation to the water resources.
  - Movement of construction vehicles through watercourses during the construction of all infrastructures will result in increased erosion that will lead to turbidity and suspended solids.
  - Servicing of construction vehicles during the construction of all infrastructure will result in increase in hydrocarbon concentrations leading to pollution in water resources
  - Removal of material from box-cut could lead to increases in turbidity and suspended solids; overburden dumps will potentially contain carbonaceous material with the potential to affect downstream watercourses by increasing sulphate and total dissolved solids (TDS) concentrations; loss of yield: rainfall on the box cut itself will be contained and not be released to the catchment.

- Dewatering of water ingress to the box-cut may lead to spillage of the potentially impacted water to the catchment that will result in an increase in sulphate and TDS concentrations.
- Establishment of borrow pits within/ in close proximity to watercourses may lead to increases in erosion which will lead to increased turbidity and suspended solids.
- The R545 Re-alignment may lead to increases erosion and therefore higher levels of turbidity and suspended solids, as well as alteration of flood lines.

Operational Phase

- Contamination of water resources during the following activities:
  - Mining of opencast pits may lead to destruction of water courses as mining progresses leading to increases in turbidity, suspended solids, sulphate and TDS, as well as further change in water chemistry including metals, anions and cations.
  - Run-off from dirty water catchment areas from workshops, offices, stockyards, and plant areas is likely to lead to increases in sulphates and TDS, and other change in water chemistry (metals, anions, cations), and increased run-off due to hardening of surfaces.
  - Spillage of coal during transportation could lead to increases in turbidity, suspended solids, sulphate and TDS.
  - Using treated water for dust and fire suppression: clean water sprayed onto the coal will become contaminated. If released to the river system, it will have the potential to impact on water chemistry, increasing sulphate and TDS concentrations.
  - Dust suppression on haul roads with dirty water from the pollution control dams will have the potential to impact on water chemistry, increasing turbidity, sulphate and TDS as well additional metals, anions and cations.
  - Cleaning and repair and maintenance activities along the R545 road may lead to contamination from hydrocarbon spills and increases suspended solids concentrations.
  - Crossing of watercourses and therefore positioning of roads in respect to floodlines may lead to an increased risk of flooding or backing up of water during extreme weather events; and an increase in flow velocities in certain areas, especially downstream of flow restricting structures.
  - Inappropriate storage and handling of hazardous substances could result in the release of hazardous substances into the receiving environment, resulting in air, soil and water pollution and may affect the health and well-being of people, plants, and animals.
- Discharge of treated water: treatment of water in the water treatment plant and discharge to the river system is likely to lead to an improvement in quality of water**,** and a net increase in yield within catchments B20F (Wilge River) and B20G (Saalklapspruit), a net **positive impact**. The discharge will however also lead to changes in seasonal stream flow.
- Discharge of treated effluent from the sewage treatment plant into pollution control dam (PCD): poor operation of the sewage treatment plant and/ or PCD may lead to spillage/ discharge of affected / untreated water that will lead to deterioration of the water quality in downstream watercourses.
- Reduced yield due to mining of opencast pits may lead to destruction of water courses as mining progresses.

- Increased flooding during extreme weather events: crossing of watercourses and therefore positioning of road in respect to floodlines.

Decommissioning and Closure Phase

- All materials and infrastructure (i.e. plant, offices, water and waste management facilities other than those mentioned below) will be removed from the site for reuse elsewhere, or for disposal at an appropriately licensed facility, and the footprint will be rehabilitated; resulting in potentially increased turbidity in receiving water bodies due to higher levels of suspended solids, and increased sediment load due to erosion
- Movement of heavy vehicles through watercourses during the demolition of all infrastructures may cause increased turbidity in receiving water bodies due to higher levels of suspended solids, and increased sediment load due to erosion
- Accidental leaks or spills while servicing of heavy vehicles during the demolition phase could generate impacts on the water quality of receiving surface water systems, resulting in increased hydrocarbon concentrations.

9.4.6.2 2020 Impact Assessment

Construction Phase

From a construction perspective, the mining of Pit H and Pit D were assessed in the original 2012 surface water impact assessment. The only changes relevant to the 2020 assessment include:

- The inclusion of offices and a destoning plant adjacent to Pit H, and a previously unplanned offloading facility and conveyor connection adjacent to Kusile (Phase 0), result in a slightly larger infrastructure footprint within which construction activities will take place. Although the cumulative infrastructure footprint is larger, the infrastructure will be constructed in an area currently occupied by maize fields; therefore, no additional impacts of loss, disturbance and fragmentation of terrestrial ecosystems and biodiversity to those already assessed are anticipated;
- In the original 2012 study, it was assumed that by the time the mining would occur at Pit H, the existing main mine infrastructure would be in place and could be used for Pit H and D. With the changed mine schedule and construction of infrastructure at Pit H and Phase 0, this assumption is no longer valid; however, since all of the newly-proposed infrastructure will be constructed in the areas where no water courses exist, no additional impacts on surface water to those already assessed are anticipated.

Based on the change in the mine schedule and infrastructure layout it is our opinion that:

- No new impacts on surface water as a result of the commencement of mining at Pit D and Pit H, construction of supporting infrastructure at Pit H, and the construction of the offloading facility and conveyor link at Phase 0, were identified.
- Since the currently proposed additional construction activities will take place on intensively-cultivated lands, and in close proximity to the existing infrastructure of Kusile Power Station, it is anticipated that there will be no significant changes in the cumulative construction-related impacts as identified in 2012 and thus there is no requirement to change the proposed 2012 mitigation measures.

Operational Phase

From an operation perspective, the mining of Pit H and Pit D were assessed in the original 2012 surface water impact assessment. The only changes relevant to the 2020 assessment include:

- The operation of the offloading facility and conveyor connection adjacent to Kusile (Phase 0): potential impacts associated with the operation of these facilities relate to the effects of dust deposition. Although

the amount of dust being generated may increase, the area where the facilities will be developed are currently under maize, any dust being generated will be suppressed via mist suppression systems, and there are no sensitive water resources located beyond the area within which any potential contamination may occur; therefore, no additional impacts on surface water resources, to those already assessed in 2012, are anticipated;

- The operation of the destoning plant at Pit H will not result in increased impacts to the water resources.

Decommissioning and Closure Phase

The rehabilitation of Pit D, Pit H and the area within which the Phase 0 infrastructure are located was assessed in the 2012 impact assessment, and no change in the significance or direction of the impact on surface water resources is required.

Post-Closure Phase

Impacts on surface water resources associated with Pit D, Pit H, Phase 0 and all associated surface infrastructure are anticipated to cease almost immediately following the cessation of the decommissioning and closure activities onsite. Based on the change in the mine schedule and infrastructure layout, it is our opinion that there will be **no** significant change in the baseline water quality condition post closure to that previously anticipated. There is thus **no** environmental significance post closure and no mitigation measures are necessary.

9.4.7 Terrestrial Ecology

9.4.7.1 2012 Impact Assessment

The 2012 terrestrial ecology impacts are as follows.

Construction Phase

- Stripping of topsoil and civil works activities, resulting in disturbance and fragmentation of terrestrial ecosystems and biodiversity[2], was assessed as being of **high** significance prior to mitigation. With the application of various mitigation measures including retention of a 100 m buffer around F. humilis habitat, minimisation of the construction footprint, and the development of a Biodiversity Action Plan (BAP) and ultimately post-mining rehabilitation, the significance of the residual impact was anticipated to be of **moderate** environmental significance.

- Opening of the box cut, resulting in habitat fragmentation and disturbance to terrestrial ecosystems and biodiversity, was assessed as being of **high** significance prior to mitigation. With the application of the mitigation measures described above, the significance of the residual impact was anticipated to be of **moderate** environmental significance.

- The loss of terrestrial ecosystems and biodiversity as a result of the construction of the coal processing plant, water management facilities, waste management facilities, and supporting infrastructure, was assessed as being of **high** significance prior to mitigation; reducing to a residual impact of **moderate** significance following application of the recommended mitigation measures, including dust control, soil management and erosion protection mitigation measures, and alien and invasive species management.

- The impact of dust and emissions generated during materials handling and transport, resulting in disturbance and fragmentation of terrestrial ecosystems and biodiversity, was assessed as being of **high** significance prior to mitigation. The application of the recommended mitigation measures for dust control,

[2] broadly referring to flora and fauna species

soil management and erosion protection mitigation measures, and rehabilitation of affected areas in the project EMP was predicted to result in a residual impact of **low** environmental significance.

- The relocation of the R545 road was anticipated to result in the loss of terrestrial ecosystems and biodiversity, as well as the permanent fragmentation of remaining areas of unaffected habitats, which was assessed as being of high significance prior to mitigation, The application of mitigation measures such as inclusion of suitable crossing points for fauna, appropriate crossing designs for rivers and/or wetlands, and minor route realignments around sensitive areas, was predicted to result in a residual impact of **moderate** environmental significance.

Operational Phase

- Operational earthworks and soil management activities, resulting in disturbance of terrestrial ecosystems and species, was assessed as being of **high** significance prior to mitigation. With the application of various mitigation measures including phased rehabilitation, retention of a 100 m buffer around F. humilis habitat, minimisation of the construction footprint, and the development of a Biodiversity Action Plan (BAP), the significance of the residual impact was anticipated to be of **moderate** environmental significance.
- Operational mining activities such as drilling and blasting were anticipated to have an impact of **low** environmental significance on terrestrial ecosystems and biodiversity both prior to and following the application of the mitigation measures outlined in the EMP.
- Since the project water treatment plant (WTP) would treat all mine-contaminated water, potential impacts on terrestrial ecosystems and biodiversity as a result of mine-generated contaminated water were assessed as being of **low** environmental significance both prior to and following the application of the mitigation measures outlined in the EMP.
- The impact of dust and emissions generated during materials handling and transport on terrestrial ecosystems and biodiversity was assessed as being of **moderate** significance prior to mitigation. The strict application of the recommended mitigation measures for dust control was predicted to result in a residual impact of **low** environmental significance.
- Earthworks associated with ongoing rehabilitation activities were assessed as potentially having an impact of **moderate** significance on terrestrial ecosystems and biodiversity, due to erosion risks, dust generation, and the potential to spread alien and invasive species. The application of the recommended mitigation measures was expected to reduce the magnitude of the potential impact, however the residual impact significance remained **moderate**.
- The ongoing permanent fragmentation of remaining areas of unaffected habitats by the R545 road during operation, was assessed as being of **moderate** significance prior to mitigation. The application of mitigation measures such as the maintenance of suitable crossing points for fauna, was predicted to result in a residual impact of **moderate** environmental significance.

Decommissioning and Closure Phase

- The rehabilitation of approximately 10 300 ha of lands impacted by Project construction and operation activities, much of which consisted of maize lands at baseline, to a grassland habitat end-use, was predicted to result in a residual **positive** impact on terrestrial ecosystems and biodiversity.

Post-Closure Phase

- Not assessed.

The 2020 biodiversity impacts are detailed below.

9.4.7.2 2020 Impact Assessment

Construction Phase

From a construction perspective, the mining of Pit H and Pit D were assessed in the original 2012 ecological impact assessment. The only changes relevant to the 2020 assessment include:

- The inclusion of offices and a destoning plant adjacent to Pit H, and a previously unplanned offloading facility and conveyor connection adjacent to Kusile (Phase 0), result in a slightly larger infrastructure footprint within which construction activities will take place. Although the cumulative infrastructure footprint is larger, the infrastructure will be constructed in an area currently occupied by maize fields; therefore, no additional impacts of loss, disturbance and fragmentation of terrestrial ecosystems and biodiversity to those already assessed are anticipated;
- In the original 2012 study, it was assumed that by the time the mining would occur at Pit H, the existing main mine infrastructure would have been in place and could have been used for Pit H and D. With the changed mine schedule and construction of infrastructure at Pit H and Phase 0, this assumption is no longer valid; however, since all of the newly-proposed infrastructure will be constructed in areas currently under maize, no additional impacts on terrestrial ecosystems and biodiversity to those already assessed are anticipated.

Based on the change in the mine schedule and infrastructure layout is our opinion that:

- No new impacts on terrestrial ecosystems and biodiversity as a result of the commencement of mining at Pit D and Pit H, construction of supporting infrastructure at Pit H, and the construction of the offloading facility and conveyor link at Phase 0, were identified.
- Since the currently proposed additional construction activities will take place on intensively-cultivated lands, it is anticipated that there will be no significant changes in the cumulative construction-related impacts as identified in 2012 and thus there is no requirement to change the proposed 2012 mitigation measures.

Operational Phase

From an operation perspective, the mining of Pit H and Pit D were assessed in the original 2012 ecological impact assessment. The only changes relevant to the 2020 assessment include:

- The operation of the offloading facility and conveyor connection adjacent to Kusile (Phase 0): potential impacts associated with the operation of these facilities relate to the effects of dust deposition on terrestrial ecosystems and biodiversity. Although the amount of dust being generated may increase, the area where the facilities will be developed are currently under maize, any dust being generated will be suppressed via mist suppression systems, and sensitive terrestrial ecosystems such as the high lying rocky shrubland community are located beyond the area within which any potential contamination may occur; therefore, no additional dust impacts on terrestrial ecosystems and biodiversity to those already assessed are anticipated;
- The operation of the destoning plant at Pit H will result in an increased level of disturbance to terrestrial biodiversity to that already assessed for mining activities such as drilling and blasting; however, in the context of the location of the destoning plant in lands currently under maize, and adjacent to the existing N12 road and Mzimkhulu mining operation, no change in the magnitude of the impact are expected and no change in the significance of the impact of mining activities on terrestrial ecosystems and biodiversity to those already assessed are anticipated.

Decommissioning and Closure Phase

The rehabilitation of Pit D, Pit H and the area within which the Phase 0 infrastructure are located was assessed in the 2012 impact assessment, and no change in the significance or direction of the impact on terrestrial ecosystems and biodiversity is required.

Post-Closure Phase

Impacts on terrestrial ecosystems and biodiversity associated with Pit D, Pit H, Phase 0 and all associated surface infrastructure are anticipated to cease almost immediately following the cessation of the decommissioning and closure activities onsite. Based on the change in the mine schedule and infrastructure layout, it is our opinion that there will be **no** significant change in the baseline terrestrial ecosystem condition post closure to that previously anticipated. There is thus **no** environmental significance post closure and no mitigation measures are necessary.

9.4.8 Wetland Ecology

The 2012 wetland ecology impacts are as follows.

9.4.8.1 2012 Impact Assessment

Construction Phase

- Direct loss or alteration of wetland vegetation and associated fauna due to construction activities such as topsoil stripped and civil works undertaken as part of preparation of the area will have a **high** impact significance. With the implementation of the recommended mitigation measures this impact will be reduced to a **moderate** impact significance.
- Similarly, direct loss or alteration of wetland vegetation and associated fauna due to the excavation of opencast mine pits and opencast mining activities will have a **high** impact significance before and after implementation of the recommended mitigation measures.
- Materials handling and transport operational activities such as loading, hauling, live placement of topsoil using truck and shovel, overburden removal and placement using small truck and shovel and dragline, loading and hauling of coal, crushing and screening of coal and transportation of coal discard are all sources of dust which will reduce water quality resulting in a **moderate** impact on downstream wetlands and associated biodiversity before mitigation and a **low** impact after mitigation.
- Direct loss or alteration of wetland vegetation and associated fauna due to the placement of infrastructure, required to support the mining operations, and associated dust from construction impacting on wetlands will have **moderate** impact significance on the environment/wetlands before and after the implementation of the recommended mitigation measures.
- The relocation of the road located to the north-east of the mining area and Honingkrantz pan will permanently fragment habitats in the area resulting in a **moderate** impact significance irrespective of implementing suitable mitigation measures.

Operational Phase

- Direct loss or alteration of wetland vegetation and associated fauna due to topsoil stripping and stockpiling will have a **high** impact significance before the implementation of mitigation measures and will be reduced to a **moderate** impact significance provided that mitigation measures are implemented as recommended.
- A **high** impact significance is envisioned as a result of the direct loss or alteration of wetland vegetation and associated fauna due to the excavation of opencast mine pits and opencast mining activities on wetlands will have a **high** impact significance before the implementation of mitigation measures. This

impact is permanent and will remain as a **high** impact even after implementing mitigation measures; and requires the implementation of additional conservation actions (see Section 7.3.4).

- It is expected that the water treatment plant will treat all contaminated water and thus no leaching of chemicals will result from coal processing and discard management activities. However, a **high** impact significance will result on downstream pans, assuming that the water treatment plant is not in place. A **low** impact significance is expected provided that the mitigation measures are implemented as recommended.
- Materials handling and transport operational activities such as loading, hauling, live placement of topsoil using truck and shovel, overburden removal and placement using small truck and shovels and draglines, loading and hauling of coal, crushing and screening of coal and transportation of coal discard are all sources of dust which will reduce water quality resulting in a **moderate** impact on downstream wetlands and associated biodiversity before mitigation and a **low** impact after mitigation.
- Direct loss or alteration of wetland vegetation and associated fauna due to the placement of infrastructure, required to support the mining operations, on wetlands will have a **moderate** significance impact before mitigation. After the implementation of mitigation measures, this impact will remain **moderate**.
- Water treatment and release will mitigate in terms of water quality and quantity to downstream wetlands, but the loss of stream seasonality cannot be mitigated and the subsequent impact on downstream wetlands is suspected to be **high** both before and after mitigation – please note that the significance of this impact has been revised under the current 2020 scenario – see Section 7.2.2.
- If managed correctly, waste management activities will have a **low** impact significance on wetlands with or without mitigation measures.

Decommissioning and Closure Phase

- Loss of stream seasonality due to water releases from water treatment plant and loss of biodiversity supported by wetlands cannot be averted. Thus, mining through wetlands will result in wetlands and their associated functions being permanently lost resulting in a **high** impact significance. Consequently, this impact will remain **high** even after the application of the recommended mitigation measures.

9.4.8.2 2020 Impact Assessment

Construction Phase

From a construction perspective, the mining of Pit H, Pit D and the main mine and subsequent effects on wetlands was assessed in the original 2012 wetland impact assessment. The changes relevant to the 2020 assessment include:

- The development of offices and a destoning plant adjacent to Pit H, as well as two overburden stockpiles, result in a larger infrastructure footprint within which construction and operation activities will take place. Although the infrastructure is sited in an area that is currently occupied by maize fields, wetness signatures were detected in the area and an additional 4.8 ha approx. of hillslope seepage wetland will be directly affected (lost) due to construction and operation of the office facilities; and an additional 14.7 ha approx. of hillslope seepage wetland will be directly affected (lost) due to the presence of the overburden stockpiles. These losses have been taken into account in the updated wetland mitigation strategy for the mine (WCS, 2020).
- The extent of Pit D has increased westwards compared to the 2012 impact assessment; this will result in the loss of an additional 13 ha of isolated hillslope seepage wetland habitat. These losses have been taken into account in the updated wetland mitigation strategy for the mine (WCS, 2020).

- The development of the Phase 0 infrastructure (Figure 9) will include the construction of the (already authorised) access road across an area of hillslope seepage wetland that is currently occupied by maize fields. Since this impact was included in the previous 2012 impact assessment, no additional impacts for the Phase 0 infrastructure were identified during this assessment.

Operational Phase

From an operation perspective, the operation phase activities associate with mining of Pit H and Pit D were assessed in the original 2012 ecological impact assessment. The only changes relevant to the 2020 assessment include:

- Potential impacts associated with the operation of the offloading facility and conveyor connection adjacent to Kusile (Phase 0) relate to the effects of dust deposition on wetlands. Although the amount of dust being generated may increase, the wetland in proximity to the area where the Phase 0 facilities will be operating are currently under maize, any dust being generated will be suppressed via mist suppression systems, and sensitive wetland ecosystems unaffected by mining are located beyond the area within which any potential contamination may occur; therefore, no additional dust impacts on wetland ecosystems to those previously assessed are anticipated.
- No new impacts on wetland ecosystems as a result of the operation phase activities associated with mining at Pit D and Pit H were identified. Although the overburden stockpiles at Pit H will remain during the operation phase, the impacts on wetlands (direct loss) was assessed as a construction phase impact.

A single revision to the 2012 impact assessment is proposed as follows:

- The 2012 impact assessment considered that the loss of stream seasonality due to water releases from water treatment plant and subsequent loss of biodiversity supported by wetlands could not be averted, resulting in an residual impact of **high** significance after the application of the recommended mitigation measures. However, in the context of anticipated flow losses to downstream systems as a result of cumulative impacts from other developments (e.g. Kusile) and drivers of change (i.e. climate change) it is Golder's opinion that the supplementation of flow to downstream systems during operation will be of benefit to downstream wetlands and can be implemented such that seasonal patterns and diffuse flows are sustained; therefore the residual impact is one of **moderate** significance.

Decommissioning and Closure Phase

A single revision to the 2012 impact assessment is proposed as follows:

- The 2012 impact assessment considered that the loss of stream seasonality due to water releases from water treatment plant and subsequent loss of biodiversity supported by wetlands could not be averted, resulting in an residual impact of **high** significance after the application of the recommended mitigation measures. However, in the context of anticipated flow losses to downstream systems as a result of cumulative impacts from other developments (e.g. Kusile) and drivers of change (i.e. climate change) it is Golder's opinion that the supplementation of flow to downstream systems at decommissioning and post closure is beneficial and can be implemented such that seasonal patterns and diffuse flows are sustained; therefore the residual impact is one of **moderate** significance.

9.4.9 Aquatic Ecology

9.4.9.1 2012 Impact Assessment

The 2012 aquatic ecology impacts are as follows.

Construction Phase

Stripping of topsoil and civil works activities, resulting in a decrease in water quality due to erosion, sedimentation and the alteration in the distribution and quantity of surface water runoff, was assessed as being of **moderate** significance prior to mitigation. With the application of various mitigation measures including soil management, dust control, minimisation of the construction footprint, and the development of a Biodiversity Action Plan (BAP) and ultimately post-mining rehabilitation, the significance of the residual impact was anticipated to be of **low** environmental significance.

The relocation of the R545 road was anticipated to result in the permanent fragmentation of aquatic ecosystems, which was assessed as being of **moderate** significance prior to mitigation, The application of mitigation measures such as appropriate crossing designs for rivers and/or wetlands, and minor route realignments around sensitive areas, was predicted to reduce the magnitude of the impact; however the residual impact would remain of **moderate** environmental significance.

Operational Phase

Operational earthworks and soil management activities, resulting in a decrease in water quality due to erosion, sedimentation and the alteration in the distribution and quantity of surface water runoff, was assessed as being of **moderate** significance prior to mitigation. With the application of the recommended mitigation measures (Section 7.4), and the development of a Biodiversity Action Plan (BAP), the significance of the residual impact was anticipated to be of **low** environmental significance.

Operational mining activities such as drilling and blasting were anticipated to have a **moderate** impact on aquatic ecosystems and biodiversity before mitigation. With mitigation measures in place these activities will have a residual impact of **low** significance on aquatic ecosystems and biodiversity.

The impact of dust and emissions generated during materials handling and transport contaminating aquatic ecosystems and biodiversity was assessed as being of **moderate** significance prior to mitigation. The strict application of the recommended mitigation measures for dust control was predicted to result in a residual impact of **low** environmental significance.

Potential impacts on aquatic ecosystems and biodiversity as a result of contamination by untreated mine-generated water were assessed as being of **high** environmental significance without mitigation; however, provided that the proposed water treatment plant is put in place and water is treated appropriately prior to discharge to the environment, a residual impact of **low** significance on the water quality of receiving surface water systems, and subsequently of aquatic ecosystems and species, is predicted.

Similarly, a potentially **positive** impact on aquatic ecosystems and biodiversity due to discharge of clean, treated water to systems that are currently partially polluted, was anticipated – both in terms of increased water quantity and quality – however, a **high** impact on previously seasonal streams was anticipated.

Decommissioning and Closure Phase

Ongoing treatment of mine water and discharge of clean water to the receiving surface water systems will continue to contribute to increased water quality and quantity in affected systems, resulting in a **positive** impact; however, the loss of seasonality in terms of stream flow would result in an impact of high residual significance. With the removal of wetlands, including Honingkrantz pan, the Study Area's ability to retain water and produce the current level of stream seasonality would be compromised.

Post-Closure Phase

- Not assessed.

9.4.9.2 2020 Impact Assessment

Construction Phase

From a construction perspective, the mining of Pit H and Pit D were assessed in the original 2012 ecological impact assessment. The only changes relevant to the 2020 assessment include:

- The inclusion of offices and a destoning plant adjacent to Pit H, and a previously unplanned offloading facility and conveyor connection adjacent to Kusile (Phase 0), result in a slightly larger infrastructure footprint within which construction activities will take place. Although the cumulative infrastructure footprint is larger, the infrastructure will be constructed in an area currently occupied by maize fields, and beyond the potential area of interaction with surface water systems; therefore, no additional impacts of loss, disturbance and fragmentation of aquatic ecosystems and biodiversity to those already assessed are anticipated;
- In the original 2012 study, it was assumed that by the time the mining would occur at Pit H, the existing main mine infrastructure would have been in place and could have been used for Pit H and D. With the changed mine schedule and construction of infrastructure at Pit H and Phase 0, this assumption is no longer valid; however, since all of the newly-proposed infrastructure will be constructed in areas currently under maize, no additional impacts on aquatic ecosystems and biodiversity to those already assessed are anticipated.

Based on the change in the mine schedule and infrastructure layout is our opinion that:

- No new impacts on aquatic ecosystems and biodiversity as a result of the commencement of mining at Pit D and Pit H, construction of supporting infrastructure at Pit H, and the construction of the offloading facility and conveyor link at Phase 0, were identified.
- Since the currently proposed additional construction activities will take place on intensively-cultivated lands, it is anticipated that there will be no significant changes in the cumulative construction-related impacts as identified in 2012 and thus there is no requirement to change the proposed 2012 mitigation measures.

Operational Phase

From an operation perspective, the mining of Pit H and Pit D were assessed in the original 2012 ecological impact assessment. Two updates to the 2012 operation-phase impact assessment were made as follows:

- Water management related impacts were split into two separate items, to address potential water quality and water quantity issues in the context of discharge of treated mine water separately.
- Improved understanding of the regional ecological water quality requirements (EWR) – particularly at the EWR4 monitoring site on the Wilge downstream of the MRA - and the promulgation of Resource Quality Objectives for the Upper Olifants Water Management Area (WMA) in which the New Largo mine is located, enable the potential overall impact of the discharge of the treated mine water to the environment during operation to be balanced against the reduction in seasonality of affected streams; as a result, the residual impact has been adjusted to one of **low** significance on aquatic ecosystems, for both water quantity and water quality effects.

The current Project-related changes (see Section 3.0) relevant to the 2020 assessment include:

- Potential impacts of the operation of the offloading facility and conveyor connection adjacent to Kusile (Phase 0) relate to the effects of dust deposition on aquatic ecosystems and biodiversity. Although the amount of dust being generated may increase, the area where the facilities will be developed are currently under maize, and sensitive aquatic ecosystems are located beyond the area within which any potential

contamination may occur; therefore, no additional dust impacts on aquatic ecosystems and biodiversity to those already assessed are anticipated;

- The operation of the destoning plant at Pit H will result in no additional disturbance or loss of aquatic ecosystems or species, since it will be located in lands currently under maize, adjacent to the existing N12 road and Mzimkhulu mining operation, with no sensitive aquatic ecosystems occurring within close proximity of the proposed development.

Decommissioning and Closure Phase

Although the planned treatment and release of water during site decommissioning and closure was assessed in the 2012 impact assessment (improved water quality and quantity, but reduced seasonality in affected receiving water bodies, resulting in a high residual impact on aquatic ecosystems) as a negative impact of high significance, the now improved understanding of the regional ecological water quality requirements (EWR) – particularly at the EWR4 monitoring site on the Wilge downstream of the MRA - and the promulgation of Resource Quality Objectives for the Upper Olifants Water Management Area (WMA) in which the New Largo mine is located, enable the potential overall impact of the discharge of the treated mine water to the environment to be balanced against the reduction in seasonality of affected streams, and as a result, the residual impact has been adjusted to one of **moderate** significance on aquatic ecosystems, during decommissioning/closure.

Post-Closure Phase

Impacts on aquatic ecosystems and biodiversity associated with Pit D, Pit H, Phase 0 and all associated surface infrastructure and activities at the main mine are anticipated to cease almost immediately following the cessation of the decommissioning and closure activities onsite. Based on the change in the mine schedule and infrastructure layout, it is our opinion that there will be no significant change in the baseline aquatic ecosystem condition post closure to that previously anticipated. There is thus no environmental significance post closure and no mitigation measures are necessary.

9.4.10 Palaeontology

All Karoo Supergroup geological formations are ranked as LOW to VERY HIGH, and here the impact is potentially VERY HIGH for the Vryheid Formation.

Fossils likely to be found are mostly plants such as ‘Glossopteris flora’ of the Vryheid Formation. The aquatic reptile Mesosaurus and fossil fish may also occur with marine invertebrates, arthropods and insects. Trace fossils can also be present. During storms a great variety of leaves, fructifications and twigs accumulated and because they were sandwiched between thin films of mud, they were preserved to bear record of the wealth and the density of the vegetation around the pools. They make it possible to reconstruct the plant life in these areas and wherever they are found, they constitute most valuable palaeobotanical records (Plumstead 1963) and can be used in palaeoenvironmental reconstructions.

Trace fossils are relatively abundant in the shales occurring near the top of the Dwyka Group. Lycopods (Leptophloem australe) have been described from the northern Free State (Mac Rae 1999). Spores and acritarchs have been reported from the interglacial mudrocks of the Dwyka Group, also pollen, wood, and plant remains in the interbedded mudrocks as well as the diamictite itself, while anthropod trackways and fish trails are present in places on bedding planes (Visser et al. 1990).

Details of the location and distribution of all significant fossil sites or key fossiliferous rock units are often difficult to be determined due to thick topsoil, subsoil, overburden and alluvium. Depth of the overburden may vary a lot.

The threats are:- earth moving equipment/machinery (front end loaders, excavators, graders, dozers) during construction, the sealing-in or destruction of fossils by development, vehicle traffic, and human disturbance.

9.4.10.1 2020 Impact Assessment

Construction Phase

No fossils were recorded during the Phase 1 Palaeontology impact assessment. It is anticipated that the construction phase activities will have no impacts on palaeontological resources, but it is always possible that chance find fossils could be unearthed when construction related activities (e.g. digging, drilling, blasting and excavating of foundations, trenches, channels and footing and removal of overburden) are being undertaken. In such an event the following procedure must be implemented to mitigate the potential impact from one of **Moderate** to one of **Low** significance:

- All construction activities must be stopped, and a 30 m no-go barrier constructed;
- Construction workers must be informed that this is a 30 m fenced no-go area;
- SAHRA must be notified; and
- A palaeontologist should be called in to determine proper mitigation measures.

Operational Phase

- Same as for construction phase.

Decommissioning Phase

- No impacts anticipated during the decommissioning phase.

9.4.11 Cultural Heritage

The key 2012 impact assessment findings are summarised as follows.

9.4.11.1 2012 Impact Assessment

Construction Phase

The following project actions were identified as having the potential to impact negatively on heritage sites and other features of cultural importance:

- Construction work which results in damage to sites.
- Looting of sites by curious workers.

Both the unmitigated and residual impacts were assessed as being of **low** significance.

Operational Phase

The following project actions were identified as having the potential to impact negatively on heritage sites and other features of cultural importance:

- Not keeping to development plans which will result in damage to sites.
- Unscheduled construction/developments which can result in damage to sites.
- Looting of sites by curious workers and visitors.

Both the unmitigated and residual impacts were assessed as being of **low** significance.

Decommissioning and Closure Phase

- None applicable.

9.4.11.2 2020 Impact Assessment

Construction Phase

From a construction perspective, the mining of the main mine and part of Pit D were assessed in the original 2012 heritage impact assessment. The changes relevant to the 2020 assessment include:

- Mining of Pit H, including construction of offices and a destoning plant adjacent to Pit H, extension of Pit D, and a previously unplanned offloading facility and conveyor connection adjacent to Kusile (Phase 0), result in a slightly larger infrastructure footprint within which construction activities will take place. However, since no heritage features were identified in Pit D, Pit H or Phase 0 locations in the updated 2020 study, no additional construction impacts were identified.
- Although the cumulative infrastructure footprint is larger, the infrastructure will be constructed in an area currently occupied by maize fields where no heritage features are present; therefore, no additional impacts on heritage features to those previously assessed are anticipated.

Operational Phase

From an operation perspective, the mining of Pit H and Pit D were assessed in the original 2012 heritage impact assessment. The only changes relevant to the 2020 assessment include:

- The operation of the offloading facility and conveyor connection adjacent to Kusile (Phase 0): potential impacts associated with the operation of these facilities relate to the effects of dust deposition. Since the area where the facilities will be developed is currently under maize, and there are no cultural heritage features present; no additional impacts on surface water resources, to those already assessed in 2012, are anticipated.
- The operation of the destoning plant at Pit H will not result in any impacts to heritage resources, since none were identified in this area.

Decommissioning and Closure Phase

Since no heritage features were identified in Pit D, Pit H or Phase 0 locations in the updated 2020 study, and impacts on heritage features are typically sustained as a result of the construction and operation phases, no decommissioning phase impacts were identified.

9.4.12 Visual

9.4.12.1 2012 Impact Assessment

The key 2012 impact assessment findings are summarised as follows.

Construction and Operation Phases

- Views and Sensitive Viewer Locations
  - In terms of the New Largo Colliery, travellers along the N4 and N12 and other local roads would be regarded as being moderately sensitive because their exposure would be temporary as they travel through the study area. Views from farmsteads and residences within the study area would be regarded as having a high sensitivity because these views would be permanent
  - Possible sensitive viewers were identified as farmsteads and residents around the northern end of the proposed R545 alignment, residents of the Voltargo community as well as residents in the Phola community. In both instances for farmsteads and residents around the northern end of the proposed alignment as well as for residences of the Phola community, the viewers are already exposed to similar views / activities from the current alignment of the R545.

- Visibility and Visual Exposure
  - The view shed analysis indicated that mining in the northern section of the MRA would be visible to an extent of less than half the zone off potential influence, resulting in **moderate** visibility. Mining activities of this area would be in the high visual exposure zone for farmsteads and residents north-west of the activity, in the moderate zone for farmsteads and residents in the south-east and in the low zone for other identified possible sensitive viewers to the west, south-west, south, south-east and east, including Kendal Agricultural Holdings to the south-east.
  - The view shed analysis indicates that mining in the central/north-central area of the MRA would also be visible to an extent of less than half the zone off potential influence, resulting in **moderate** visibility. Mining activities of the middle stage would be in the moderate visual exposure zone for farmsteads and residents in the south-west and east and in the low zone for other identified possible sensitive viewers to the west, south-west, south, south-east and east, including Kendal Agricultural Holdings to the south-east
  - The view shed analysis indicates that mining in the southern area of the MRA would be visible to an extent of over half the zone off potential influence, resulting in **high** visibility. Mining activities of the late stage would be in the high visual exposure zone for travellers along the N12 as well as to residents in the north-eastern corner of the Kendal Agricultural Holdings. The activities would be moderate zone for the communities of Kendal Agricultural Holdings, Voltargo and Phola as well as for farmsteads and residents in the west, south-west, south, south-east and east. It would be in the low zone for other identified possible sensitive viewers to the west and north-east.
  - The view shed analysis for the relocation of the R545 illustrates that road option 1 would be visible for over half the zone of potential influence resulting in a **high** visibility. Views from the farmsteads and residences in the north would be in the middle to background for viewers where views from residents in Phola would be in the fore- to middle ground. Views from residents from the Voltargo community would be in the foreground
- Visual Intrusion
  - Visual intrusion would be rated as **moderate** since it could be regarded as being partially compatible with land use patterns within the study area contrasting moderately with the patterns or elements that define the structure of the landscape thus causing a moderate change in landscape characteristics.
  - In all three instances (farmsteads and residences in the north, Phola community as well as Voltargo community) the viewers are already exposed to similar activities associated with the current alignment of the R545. Other possible views from farms adjacent to the proposed alignment option would include views of the proposed mining activities resulting in a **low** visual intrusion for the project on the viewers
- Severity of visual impact
  - The severity of the visual impact of the proposed opencast mine with associated structures would be rated as **moderate** as it would result in a partial alteration to key characteristics of the baseline environment with the introduction of elements that may be prominent but may not necessarily be considered to be substantially uncharacteristic when set within the attributes of the receiving landscape.
  - The re-alignment of the R545 along Option 1 would have a minimal negative effect on the sense of place when viewed within context of the proposed mining activities. Even though it would disturb the sense of place within the study area, it would be viewed in context of the proposed mining activities

resulting in it being absorbed within the 'new' landscape context. The most disturbing impact would be where it would be re-aligned to the east of the Voltargo community.

- The severity of the visual impact of the relocation of the R545 road with regards to the viewers from the Voltargo community has been rated as **moderate** due to a partial alteration to key features of the baseline environment. For the farmsteads and residents of the Phola community, the severity has been rated as negligible due to a very minor alteration to the key element of the baseline environment

9.4.12.2 2020 Impact Assessment

The following potential visual impacts that may occur during the construction, operational and decommissioning/closure phases of the mine were identified. For the purposes of this assessment, potential impacts during the construction and operational phases have been grouped together, as they are expected to be largely similar in nature, although potentially of varying magnitude.

9.4.12.2.1 Construction and Operational Phases

- Reduction in visual resource value due to presence of the overburden and topsoil stockpiles;
- Reduction in visual resource value due to presence of plant infrastructure;
- Formation of dust plumes as a result of construction and operational activities; and
- Light pollution at night.

9.4.12.2.2 Decommissioning and Closure Phase

- Reinstatement of visual resource value due to removal/dismantling of mining facilities and infrastructure and subsequent rehabilitation of footprint areas;
- Visible dust plumes during rehabilitation.

The magnitude of a visual impact is determined by considering the visual resource value and Visual Absorption Capacity (VAC) of the landscape in which the project will take place, the receptors potentially affected by it, together with the level of visibility of the project components, their degree of visual intrusion and the potential visual exposure of receptors to the project, as further elaborated on below:

Theoretical Visibility

Construction and Operational Phase Impacts

- **Presence of the overburden and topsoil stockpiles:** The anticipated final heights of Pit H's overburden and topsoil stockpiles will be 20 m and 5 m, respectively. Those of Pit D will be 10 m and 3 m respectively. The viewshed indicates that these features will be visible from locations across about half the study area. These include inter alia multiple residential locales scattered through the study, the residences located in Kendal Forest Holdings, as well as along the approaches of all the main arterial roads, such as the N12. Based on the viewshed, the LTV of the stockpiles is conservatively rated at **moderate**.
- **Presence of the plant infrastructure:** Plant infrastructure at Pit H will be located adjacent to the east boxcut. At this location, it is anticipated that plant infrastructure will be largely screened from view by the new topsoil stockpiles and soft overburden dump, and the existing spoil heaps located at the adjacent mine. The level of visibility of plant infrastructure is therefore expected to be **low**.
- **Formation of dust plumes:** During construction and operations, especially during dry and windy conditions, it is expected that activities on site will result in airborne dust plumes, which may be visible over great distances, often far greater than the activity that is causing it. For this reason, the level of visibility of dust plumes associated with mine construction and operations is expected to be **moderate**; and

- **Light pollution at night**: The level of visibility of light pollution is expected to be **moderate** during the construction and operational phases.

Decommissioning and Closure Phase Impacts

- **Removal/dismantling of mining facilities and infrastructure and rehabilitation of footprint areas:** During decommissioning and closure the stockpiles and mine infrastructure will be dismantled and/or removed and the affected footprint areas will be rehabilitated. Rehabilitation will include contouring and active revegetation. Post closure, this impact is therefore rated as **low**;
- **Formation of dust plumes:** Rehabilitation activities are also expected to cause airborne dust, however at a lower frequency, smaller scale and much shorter time period than during operations. Nevertheless, the visibility of this impact is still expected to be **moderate** within the study area.

Visual Intrusion

The expected level of visual intrusion of each of the project components is assessed below.

Construction and Operational Phase Impacts

- **Presence of the overburden and topsoil stockpiles:** Despite the stark contrast between the height and geometric shape of the stockpiles and the natural setting, the study area and surrounding landscape already display a high degree of modification and are thus already visually complex. The proposed stockpiles are therefore expected to have a **low** intrusive value within the existing context; and
- **Presence of plant infrastructure:** Mine infrastructure will comprise various operational facilities that are geometric in shape and will contrast sharply with the immediate natural landscape. However, as mentioned above, in light of the existing complexity of the broader landscape, the level of visual intrusion is expected to be **low**.
- **Formation of dust plumes:** Dust plumes are often one of the more socially objectionable impacts associated with opencast mining, due to the associated potential health risks, nuisance factor and degradation of the visual amenity value of the surrounding landscape. Existing mining operations and power stations (ash disposal facilities) in the study area currently generate large volumes of dust. This is also compounded at certain times of the year by farming activities such as ploughing and tilling. Considering the baseline dust conditions, dust impact has a **low** intrusive value from a visual perspective.
- **Light pollution at night**: As with dust pollution, light pollution can be a highly objectionable night-time impact in rural landscapes. However, the presence of artificial light sources in the study area including at existing mines, residential areas and associated with traffic along the major roads (e.g. N12) is high. Hence, this impact has been rated as having **low** intrusive value.

Decommissioning and Closure Phase Impacts

- **Removal/dismantling of mining facilities and infrastructure and rehabilitation of footprint areas:** The dismantling and/or removal of infrastructure and stockpiles, coupled with rehabilitation of disturbed footprint, will have a positive visual impact compared to that of operations, and to a large extent reinstate the original visual character of the affected footprint areas. Hence, the resultant level of visual intrusion of the end state of these areas is expected to be negligible; and
- **Formation of dust plumes:** Initial rehabilitation activities are expected to cause dust entrainment from the project site. However, the frequency will reduce as revegetation progresses. The intrusion of dust will therefore remain **low** in the study area during this phase.

Visual Exposure

Visual exposure is an expression of how close receptors are expected to get to the proposed interventions on a regular basis. For the purposes of this assessment, close range views (equating to a high level of visual exposure) are views over a distance of 500 m or less, medium-range views (equating to a moderate/medium level of visual exposure) are views of 500 m to 2 km, and long range views are over distances greater than 2 km (low levels of visual exposure).

Construction and Operational Phase Impacts

- **All identified impacts:** Certain residents of Kendal Forest Holdings will be located in close proximity (< 1km) to Pit H. These will experience close- to medium range views. Most other visual receptors in the study area will have long-range views. Overall, **moderate** levels of visual exposure are therefore expected across the study area.

Decommissioning and Closure Phase Impacts

- **All identified impacts:** As is the case with the construction and operations phase impacts, overall visual receptors will experience close- to long-range views. Visual exposure to the rehabilitation/closure related impacts is therefore rated as **moderate**.

Based on the ranking, the magnitude of the respective impacts has been determined as **low**.

9.4.13 Social

9.4.13.1 2012 Impact Assessment

The key 2012 impact assessment findings are summarised as follows.

- Impacts on the farming community were split into three broad categories:
  - Impacts on livelihoods – this include loss of land, water issues, dust, transport costs and loss of labour.
  - Impacts on safety – this include road safety and personal safety.
  - Impacts on quality of life – this includes impacts on the sense of place, dust, noise, vibrations and health.

The impacts on the surrounding communities were grouped as follows:

- Economic impacts (positive) – this includes job creation, skills development and opportunities for small and medium sized enterprises.
- Economic impacts (negative) – this includes competition for jobs, possible community unrest related to labour issues and increase in transport costs.
- Impacts related to an influx of people – this include impacts on physical and social infrastructure, health impacts, crime, safety and security, the integration of the workforce with existing communities and access to resources.
- Impacts on quality of life – this include impacts of blasting, noise, dust, vibrations, sense of place, health impacts and movement patterns.
- Impacts related to displacement – these impacts will be relevant if the Old New Largo Village should be relocated or if any residents feel that they can no longer live in the area due to the presence of the mine.

9.4.13.2 2020 Impact Assessment

The key 2020 impact assessment findings are summarised as follows.

Positive impacts

The project changes will not adversely influence the overall positive impacts of the mine. These positive effects are as follows:

- The project will lead to increased business opportunities for local and regional suppliers. Most of the community members around New Largo live below the poverty threshold and may benefit from increased business and job opportunities. This benefit will also have an impact outside the mining area.
- New Largo will encourage the employment of local community members and where appropriate develop their skills (as part of the SLP process) to a point where incomes will increase based on improving qualifications. The process may lead to an increased housing need and a rise in prices for accommodation in the area. The skills development will take place during commissioning, operation and continue to closure.
- There is an expectation that New Largo will employ youth and women in Kendal, Wilge and New Largo areas. This expectation needs to be carefully managed and planned as part of the Social and Labour Plan's Skill Development Plans. The process needs to start immediately with a skills audit to determine the skills and qualification level in these communities.
- The Community Specialist from New Largo has regular meetings with the Community Consultative Forum to ensure that Basic Human Rights issues raised in the forum meetings like access to water, roads and electricity are addressed.
- New Largo is developing a SLP that will include community development projects. The community has already been engaged regarding this process during the CCF meetings.
- New Largo will establish a Joint Forum (New Largo, Eskom, South32, Mzimkhulu.

Adverse impacts

Several adverse impacts have emerged due to the proposed project changes. These implications are causally related to the decision to start mining with Pit D and H and to truck coal, as the overland conveyor system will not be constructed until later in the project lifetime.

- Coal will be trucked from Pits D and H to the destinations. There will be 275 truckloads of 32 tonnes each per working day (average 25 days per month) initiated from Pit D, and 250 truckloads from Pit H. Indications are that this load will be carried on sections of the R545, R555, and R960/686. At 475 truckloads per working day, this represents a notable increase in average traffic load. The potential impact is considered to be of **high** significance from a social perspective prior to mitigation; the residual impact is of **moderate** significance.
- New Largo has changed the mine plans and reviewed the relocation processes and priority areas. These changes have led to uncertainty in terms of exact relocation timeframes for the New Largo Pit H, and Pit D affected community. New Largo did indicate that the first 10 years of operation would not result in any further relocation of people. However, there is still uncertainty regarding the relocation process, priority areas and overall timeframes. If not addressed, such a scenario could result in adverse human rights impacts. The potential impact is considered to be of **moderate** significance from a social perspective prior to mitigation; the residual impact is of **low** significance, since New Largo will conduct a RAP to determine which communities will be affected and when.
- There is an enduring perception that mining causes severe health hazards like asthma and lung disease. The New Largo communities raised some concerns around the health and safety of the community. The potential impact is considered to be of **moderate** significance from a social perspective prior to mitigation; the residual impact remains of **moderate** significance, with a lower impact rating.

- There is a concern that the blasting might harm underground water quality and volumes. This is an issue for communities that rely on boreholes. The potential impact is considered to be of **moderate** significance from a social perspective prior to mitigation; the residual impact remains of **moderate** significance, with a lower impact rating.
- There is a concern that blasting might cause cracking of houses. New Largo will conduct a crack survey to determine the conditions of the houses before mining and during mining. It is recommended that the results of the crack survey be shared with the households. Such surveys should be updated regularly, typically every three to four years, depending on the intensity of the mining and the proximity of the houses. The potential impact is considered to be of **moderate** significance from a social perspective prior to mitigation; the residual impact remains of **moderate** significance, with a lower impact rating.
- Livelihood restoration aspects need more attention. This aspect was raised during the stakeholder consultation process. Livelihood restoration is a concern not only due to the implications of the project changes but also for the overall mine. The potential impact is considered to be negative and of **moderate** significance from a social perspective prior to mitigation; the residual impact is expected to be of **positive** significance.

9.5 Assessment of Potential Impacts and Risks

The findings of the specialist studies, which guided the selection of the preferred alternatives, are presented in Section 9.4 of this EIA/EMPr report. The complete specialist reports are appended to this EIA/EMPr report. The specialists' findings were used to assess the environmental impacts and risks associated with the project, which are described in detail in Section 9.4.

9.6 Positive and Negative Impacts of Preferred Approach and Alternatives

See Section 3.5 of this report for a discussion on the alternatives considered and their positive and negative impacts.

9.7 Possible Mitigation Measures and Levels of Risk

For each identified impact described in the sections above, possible mitigation measures and post-mitigation impact significance ratings have been provided – refer to Section 10.4.

9.8 Motivation where No Alternative Sites Were Considered

See Section 3.5 of this report for a discussion on the alternatives considered.

9.9 Summary of Environmental Impacts

Appendix F summarises the impacts directly related to the construction phase, operational phase and decommissioning phase of the proposed project and provides a significance rating for each impact before and after mitigation.

10.0 ENVIRONMENTAL IMPACT STATEMENT

10.1 Key findings: Potential Cumulative Environmental Impacts

The following potential cumulative impacts were identified and assessed.

10.1.1 Soil, land use and land capability

The Synergistics (2012) EIA identified cumulative impacts on the soils and land capability in the context of the overall reduction in the availability of the resource and the potential loss of utilisable materials that have the

ability to produce agricultural products; however, the overall loss of resource due to erosion, compaction and contamination was considered unlikely to be an issue in terms of cumulative effects as these constraints are site specific. Although soil resources are not limited in the region, the loss of land capability and a change in land use associated with other developments (townlands, additional mining, power stations etc.) could result in a loss of livelihood for the present/existing communities. Further pressures were anticipated to arise if there is an influx of job seekers to the region, with these job seekers potentially establishing informal settlements and resorting to subsistence type agricultural practices, all of which could further sterilising arable and economically viable soil resources.

Since 2012, additional cumulative impacts on the availability of the soil resource have been contributed to by the adjacent Kusile Power Station footprint and development of new mines in the region. Since the mining of Pit D and H, and development of infrastructure in the northern area of the MRA where Phase 0 will be located was previously considered, the previously identified cumulative impacts discussed above (Synergistics, 2012) remain relevant.

10.1.2 Air quality

The proposed mining operations are located within the Highveld Priority Area. The management plan objectives for this priority area are to consider the reduction of baseline concentrations in order to make room for new development. The Synergistics (2012) EIA identified that cumulative impacts on PM_{10} concentrations (taking into consideration the annual average PM_{10} concentrations for Kendal 2 monitoring station are 67.7 µg/m³ and the predicted annual average PM_{10} concentrations for Kusile Power Station at Phola and Voltargo (Wilge) are 4 µg/m³) may be in non-compliance with NAAQS at the sensitive receptors of Phola and Voltargo (Wilge) due to elevated background PM_{10} levels.

Although the New Largo project's contribution to cumulative impacts is anticipated to be minor, given that the residual impact on air quality following the implementation of the recommended mitigation measures is anticipated to be of a **low** environmental significance; given the construction and commencement of operation of the Kusile Power Station and ash dump adjacent to New Largo, the overall cumulative impact on air quality in the study area is likely to be significant. The mitigation measures proposed in the 2020 impact assessment should be supplemented with a greenhouse (GHG) assessment to determine the possible impact of the operations to GHG contributions, and gain a greater understanding of its contribution to cumulative impacts.

10.1.3 Traffic

The 2012 traffic assessment (WSP, 2012 – Appendix C) was focussed on the relocation of the R545 and did not consider traffic impacts arising from coal trucking, since at that stage it was envisaged that coal would be transported to Kusile via a conveyor from the outset.

Since the 2020 traffic assessment shows only that capacity upgrading will be required shortly after year 2030; and no other mitigation measures are required from the applicant from a capacity and operational perspective; the project's contribution to cumulative impacts on traffic are expected to be low.

10.1.4 Noise

The Synergistics (2012) impact assessment identified Project contributions to cumulative noise impacts on receptors within 3 km of Kusile Power Station, and 250 m either side of the Phola-Kusile conveyor, for both the construction and operation phases. Over most of the life-of-mine the cumulative impact was considered negligible, with cumulative impacts only predicted when the opencast operation approaches the conveyor, at which point any house located both within a distance of 250 m from the conveyor and 1,5 km from the haul road would experience a cumulative impact of 8 or dB or more (Synergistics, 2012).

Although the New Largo project's contribution to cumulative impacts is anticipated to be minor, given that the residual impact on noise following the implementation of the recommended mitigation measures is anticipated to be of a **low** environmental significance; the overall cumulative noise impact on sensitive receptors in the study area is likely to become significant when the opencast operation approaches the nearby roads, at which point any sensitive receptor located within 1,5 km from those road may experience an increased cumulative noise impact. As was the case in 2012, cumulative impacts on receptors are expected at a later stage in the LOM, when the conveyor is eventually constructed.

10.1.5 Groundwater

The potential contribution of the New Largo project to cumulative impacts on the quality and quantity of groundwater were identified as significant in 2012 (Synergistics). Since the mine will be the largest opencast pit in the area, mining for a period of up to 50 years, and given the identified impacts on groundwater quality and quantity, including loss of stream base flow, it was anticipated that the cumulative impacts would be significant, in combination with the numerous other nearby opencast activities in the region.

The early mining of Pit H and Pit D and construction of Phase 0 infrastructure as part of the 2020 proposal is thus also expected to contribute to cumulative impact on lowering the water table and may have increased impacts on potential groundwater users surrounding these areas. Additional deterioration of water quality in the area is expected as result of mining, although potential contamination plumes will be contained as result of dewatering and water management by pumping.

10.1.6 Surface Water

Projects and activities contributing to cumulative impacts on water quality and quantity in the vicinity of the MRA identified by Synergistics in 2012 included existing mining, Phola Sewage works, the Phola-Kusile Conveyor System, as well as Kendal power station and the new Kusile power stations, etc., as well as the New Largo Colliery itself; with New Largo estimated to add some 70% to the total catchment area that is currently affected (i.e. 114km^2) and therefore being a potentially significant contributor to cumulative impacts. However, when the discharge of clean, treated mine water to receiving water bodies (Wilge River, and particularly the heavily polluted Saalklapspruit) throughout operation and beyond are taken into account, a net positive impact on the quantity and potentially quality of water in these systems was predicted.

This remains the view from the 2020 perspective, since the early mining of Pit D and H, and construction and operation of the Phase 0 infrastructure has resulted in no changes to the 2012 impact assessment.

10.1.7 Terrestrial Ecology

The loss and fragmentation of the remaining patches of terrestrial ecosystems within the MRA will add to cumulative impacts on these ecosystems in the landscape, reducing their extent and also potentially adding to grazing pressure on remnant grasslands not suitable for cultivation, resulting in degradation of these systems. Fragmentation of habitats has the potential to isolate faunal individuals, reducing available foraging habitat and driving the loss of interaction between meta-populations; therefore, maintaining connectivity within the landscape should be priority. The effective implementation of the recommended mitigation measures, in particular, the development of a BAP, inclusion of appropriately designed crossing structures in the relocated road design, and the wetland mitigation strategy, will be key in ensuring that landscape connectivity is maintained and the Project's contribution to cumulative effects in this regard are minimised.

The area where F. humilis was previously confirmed to occur (SANBI, 2007) has been the subject of expanded sand mining activities, it will therefore be critical to ensure that no further negative impact will be sustained on the extent and condition of habitats supporting this species as a result of the New Largo operation, which will require the strict implementation of the additional mitigation measures described above, that is, definition of the current extent and condition of habitats where F. humilis has previously been recorded, as well as the

development of options for the harvesting of seed of the species for propagation, or translocation, to be agreed with the relevant permitting authorities (e.g. SANBI, Mpumalanga Parks and Tourism Agency).

10.1.8 Wetland Ecology

The loss and fragmentation of the remaining patches of wetland ecosystems within the MRA will add to cumulative impacts on these ecosystems in the landscape; reducing their extent, degradation of their condition, and subsequently limiting their ability to deliver ecosystem services. The direct losses of wetlands cannot be mitigated outright, and as such the Project will contribute to the cumulative rate of loss of wetlands and particularly pan habitats in the Mpumalanga Highveld ecoregion. The effective implementation of the recommended mitigation measures, and in particular, the commitment to delivery of a wetland offset strategy as outlined in the wetland mitigation strategy for the Project, will be key in ensuring that the Project's contribution to cumulative effects on the delivery ecosystem services relating to the quantity and quality of freshwater supply are minimised, through protecting and conserving currently unprotected wetland habitat in off site offsets, and rehabilitating remaining wetlands within the MRA to improve their condition and thus enhance their level of functioning and supply of ecosystem services in the landscape.

10.1.9 Aquatic Ecology

The potential Project effects on the quality and quantity of water in aquatic ecosystems within the MRA will add to cumulative impacts on these ecosystems in the landscape, potentially adding to existing pollution pressure, resulting in degradation of these systems. Disturbance/impoundment of linear aquatic habitats has the potential to isolate aquatic fauna (particularly fish), reducing available foraging habitat and driving the loss of interaction between meta-populations; therefore, maintaining connectivity between areas of upstream and downstream flow throughout the Project construction, operation and decommissioning phases is of critical importance. The effective implementation of the recommended mitigation measures, in particular, the development of a site-wide biodiversity management plan (BMP), inclusion of appropriately designed crossing structures for riparian systems in the relocated road design, and enhanced management of the proposed discharge of clean treated mine water to receiving aquatic ecosystems, will be key in ensuring that the Project's contribution to cumulative negative effects on aquatic ecosystems and biodiversity is minimised.

10.1.10 Visual

The region was predominantly an agricultural landscape that has been substantially transformed by mining over the recent years. The cumulative impact associated with the existing visual impacts from existing mine infrastructure and facilities, coupled with the anticipated visual impacts from the proposed Project infrastructure and activities may negatively affect the general visual aesthetics of the broader region.

10.2 Final site maps

See Figure 1, Figure 10 and Figure 11, respectively for the layouts of the New Largo Main Mine, Pit H and Pit D.

10.3 Summary of Positive and Negative Implications and Risks of Proposed Activity and Alternatives

See Section 3.5 of this report for a discussion on the positive and negatives of the alternatives considered.

10.4 Proposed impact management objectives and the impact management outcomes for inclusion in the EMPr

The impact management objectives and management outcomes are described in detail in Appendix F.

10.5 Description of any assumptions, uncertainties, and gaps in knowledge

Knowledge gaps identified during the course of the update of the various specialist studies conducted in 2020 are summarised as follows.

10.5.1 Soils

- The soil reconnaissance survey for Pit H and Pit D was confirmatory of the baseline survey and therefore soil samples were not collected for laboratory analyses to determine agricultural potential indicators. The 2006 baseline report includes agricultural indicator results for composite samples of representative soil forms collected across the mining right area of the New Largo MRA. It should however be noted that the sample ID`s were not georeferenced to their discrete samples and soil forms, making it difficult to assign the results of each composite sample to a specific soil form. The soil specialist report therefore does not include the interpretation of agricultural potential indicators.

10.5.2 Air Quality

- Much of the existing historic ambient air quality data for the project area is considered dated (i.e. >5-10 years old) and would not been deemed acceptable for the purpose of the updated air quality assessment. Such historic data has therefore been excluded from this report in favour of more current data sets with suitable data recovery levels (i.e. over 80% date recovery levels);
- Dust monitoring results provided by New Largo are representative of the typical cumulative emissions from the current New Largo operations; and
- Due to the proximity of the Ogies weather station to New Largo, the experienced meteorological conditions at this station are anticipated to be relatively similar to that experienced onsite.

10.5.3 Traffic

- It has been assumed that 60% of the daily staff traffic (50% distributed to and from the N4 and 50% distributed to and from the N12) and 20% of the daily coal trucks will travel during the respective peak hours; and
- The pavement conditions of the provincial roads in the area, and their requirement for maintenance and rehabilitation, is the responsibility of the Mpumalanga Provincial Government, Department of Public Works, Roads and Transport (DPWRT). Despite numerous written and telephonic attempts to obtain the necessary information from the DPWRT, no feedback has been received from the DPWRT to date. Therefore an assumption was made that the Mpumalanga Provincial Government, DPWRT, will comply with their constitutional mandate to implement the necessary maintenance interventions on the road network as required.

10.5.4 Noise

- No significant changes have been observed in the land use noise sources within a 10 km radius of the project area between 2012 and 2020 and thus it was assumed that the 2012 noise monitoring data remains valid however some variations may exist; and
- Due to the proximity of the Ogies weather station to New Largo, the experienced meteorological conditions at this station are anticipated to be relatively similar to that experienced onsite.

10.5.5 Groundwater

- The groundwater model conducted by Delta H (2019) incorporated an earlier version of the New Largo LoM plan. This plan did not take into account Pit D extension. An updated groundwater model would need

to be considered to fully assess the effects of Pit D extension. A hydrogeological study for Pit D was however conducted by Geo Pollution Technologies (2019), to provide an understanding of groundwater flows for the following scenarios:

- Pre-mining;
- During-Mining; and
- Post-Mining.
- Despite the modelled predictions, it must be stressed that structures of preferred groundwater flow have not been modelled consider the effects of Pit D extension.

10.5.6 Surface Water

- The original baseline surface water impact assessment for the New Largo MRA was conducted over the course of several field trips conducted in 2010 and 2011, and as such, the data is relatively old. However, considering that land use in the MRA has not significantly changed in the interim, the original baseline data was largely relied on in the production of the updated surface water specialist report, supplemented with more-recently available information, and the results of the field assessment conducted as part of the updated study.
- Water quality data used for the assessment was collected for the following periods:
  - October 2010 to December 2012, monthly from October to February and every second month thereafter;
  - 2013: limited to one sampling event during low flow conditions;
  - 2014: monitoring during March and August 2014, representing high flow and low flow conditions respectively;
  - Monthly sampling during 2016, 2017 and 2018 (not all sites) and in-situ data from biomonitoring reports; and
  - Once off samples in May and July 2020.

The confidence of the data is high as the analyses were undertaken by accredited laboratories and spans a ten year period.

10.5.7 Terrestrial Ecology

- No new faunal surveys were conducted; the results of the 2011 baseline study were used to inform the current study since no significant changes in the baseline fauna were anticipated, given the relatively unchanged land use context of the MRA.
- Given the difficulty in fully sampling and characterising the abundance and distribution of faunal species in the study area during the short period of time generally allocated to broad fauna baseline studies for impact assessment, the 2012 baseline description was qualitative, and the mitigation measures devised for fauna in the subsequent impact assessment were based on assumptions, estimations and subjective reasoning.
- The following confidence levels were attributed to the flora species recorded during the 2011 baseline surveys: Families – 95%, Genera – 85% and Species – 75%.

10.5.8 Wetland Ecology

Much of the available wetland baseline data dates back to 2011-2012. Although the original baseline data is dated, the land uses and drivers of change in the MRA have not changed significantly in the interim period, and the baseline data has been updated for systems where some change in condition may have occurred (e.g. Honingkrantz Pan, due to sand mining), or where new potential impacts could occur (wetlands within 500 m of Pit D and Pit H).

10.5.9 Aquatic Ecology

The original baseline ecological assessment of the New Largo MRA was conducted over the course of several field trips conducted in 2010 and 2011, and as such, the data is relatively old. However, a full suite of annual aquatic biomonitoring survey reports from surveys conducted during 2012-2020 (Ecotone, 2012-2018; 2019, 2020) were made available to develop a comprehensive baseline of the current aquatic ecosystem status to inform this assessment. Both the wet and dry seasons are well represented in the data used for the assessment.

No new aquatic biomonitoring surveys were conducted by Golder as part of the aquatic specialist report update; the results of the annual aquatic biomonitoring survey reports 2012-2020 (Ecotone, 2012-2018; 2019, 2020) were reviewed and used to inform the current study.

10.5.10 Palaeontology

The following general limitations apply:

- Most development areas have never been surveyed by a palaeontologist or geophysicist;
- Variable accuracy of geological maps and associated information;
- Poor locality information on sheet explanations for geological maps;
- Lack of published data;
- Lack of rocky outcrops; and
- Inaccessibility of site.

10.5.11 Visual

- This study relied, in part, on a review of available satellite imagery and land over classification data. Neither dataset is from 2020. Considering the ongoing expansion of mining operations and other associated forms of disturbance in the study area, it is likely that satellite imagery and land cover data do not show the current extent of modification.
- Determining the value, quality and significance of a visual resource or the significance of the visual impact that any activity may have on it, in absolute terms, is not achievable. The value of a visual resource is partly determined by the viewer and is influenced by that person's socio-economic, cultural and specific family background, and is even subject to fluctuating and intangible factors, such as emotional mood and appreciation of 'sense of place'.
- This situation is compounded by the fact that the conditions under which the visual resource is viewed can change dramatically due to natural phenomena, such as weather, climatic conditions and seasonal change. Visual impact cannot therefore be measured simply and reliably, as is for instance the case with water, noise or air pollution; and
- It is therefore not possible to conduct a visual assessment without relying to some extent on the expert opinion of a qualified consultant, which is inherently subjective. The subjective opinion of the visual

consultant is however unlikely to materially influence the findings and recommendations of this study, as a wide body of scientific knowledge exists in the industry of VIA, on which findings are based.

10.5.12 Closure

Key components of integrated rehabilitation planning have been addressed for New largo and include the development of a predictive post mining landform design, pre-stripping and topsoil stripping integrated with the LoM scheduling. Areas that require further attention include the following:

- Further detail design work is required in developing a backfill and cover methodology for placing the mineral residue and/or discard back into the pit, this is a key factor determining long term groundwater management costs.
- The topsoil stripping plan (Figure 6 in Closure Report, Appendix E) must be expanded to include a site-wide topsoil placement and envisaged post mining land capability plan. The topsoil placement plan must be developed and integrated with the post mining landform (PML) design, stripping plan and LoM schedule. The placement plan must be based on available volumes and make allowances for placement of wetland and arable soils to specific destinations based on the PML drainage framework and planned end land use capabilities;
- Drainage densities and storm water velocities should be determined by hydrological calculations based on the post mining landform design, the design should be refined as required and additional storm water measures devised for areas of high risk to erosion and scouring;
- Specialist studies are required to develop a comprehensive end land use plan for New Largo to ensure that the “no-nett loss of agricultural potential” is achieved and that the end land use aligns with surrounding land uses and broader strategic land use planning for the region.
- Rehabilitation and closure objectives must be refined and included in the ARP to ensure that the objectives are systematically addressed as part of the concurrent rehabilitation during the LoM;
- Innovative methodologies and possible equipment modifications need to be investigated for the development of the boxcut topsoil stockpile. Due to space limitations the stockpile at the box cut will exceed 10 – 20 meters, constructing and storing soils in such a large facility has the potential to cause massive and potentially irreversible compaction.
- More detailed work on the costs for the interventions required as part of the mitigation strategy for the loss of the Honingkrantz pan; as well as the costing for the implementation of the wetland offset strategy. An ecological management plan for the springs and the rocky habitat will also be required.
- Determine if the long-term excess mine water make to be treated can be reduced by:
- Relooking at the in-pit discard disposal strategy (impact on feed water quality);
- Optimising the topography and backfill (reduce ingress)
- Lining the valleys with wetland soils (reduce ingress)
- Align topography with next land use requirements
- Costing for the implementation of the wetland offset strategy
- Ongoing rehabilitation performance monitoring to confirm that the functional land capability of rehabilitated open pits to determine whether the rehabilitation outcomes will support the EMP commitments for no nett loss in food production.

10.6 Reasoned opinion as to whether the proposed activity should or should not be authorised

Provided that all the environmental management measures described in this Amendment to the EMPr are applied diligently, it is expected that the proposed changes to the approved EMPr will not result in any environmental impacts that cannot be mitigated to acceptable levels.

Not granting this authorisation will result in the benefits of the project to New Largo Coal and to local residents, as described in Section 6.0, not being realised.

Accordingly, it is the opinion of the environmental assessment practitioner that the application for EMPr amendment to enable New Largo to undertake the activities described in this Amendment to the EMPr should be granted.

10.7 Aspects for inclusion as conditions of Authorisation

10.7.1 General Conditions

New Largo must:

- Implement all aspects of the EMPr in sections **Part B** of this document;
- Comply with all relevant legislation at all times;
- Undertake annual internal auditing of environmental performance and annual reporting to the DMRE, in line with the EMP commitments; and
- Undertake biennial external auditing of environmental performance and provide the DMRE with a copy of the audit report, in line with the EMP commitments.

10.7.2 Site Specific Conditions

Over and above the conditions contained in the original EA/EMPr, the following must be complied with:

Noise:

- The destoning plant infrastructure must be developed in such a manner such that the waste rock dumps act as screens to reduce the noise impacts at nearby sensitive receptors. If such layouts cannot be accommodated, then suitable earth berms must be constructed to reduce the noise impacts at nearby sensitive receptors.

Air quality:

- Wet suppression on unpaved trucking routes;
- Tarpaulin load covering, where possible, to prevent the generation of fugitive dusts while trucking on public roads;
- Suitable mitigation measures should be implemented on and/or at the destoning plant to mitigate the generation of fugitive dust and fine particulate emissions. These may include the following:
- Surrounding the plant with suitable berms to act as a screen; and
- Install dust mist suppression sprays to knock out the dust at source on the destoning plant.

Terrestrial ecology:

- The current extent and condition of the habitats where F. humilis was previously identified, and the likelihood of similar rocky ridge habitat in the MRA to support F. humilis, should be determined via a survey conducted by a suitably qualified/experienced botanist in the flowering season (wet season 2021). Areas

where the species occurs should then be marked out and fenced off as necessary, to ensure that no further loss or disturbance of this species takes place.

- In the event that the in-situ conservation of F. humilis is considered at risk from previous mining operations, options for the harvesting of seed of the species for propagation, or translocation, must be defined and agreed with the relevant permitting authorities (e.g. SANBI, Mpumalanga Parks and Tourism Agency).
- A Biodiversity Action Plan that describes and schedules the required conservation actions for F. humilis and all remaining areas of natural habitat (high lying rocky shrubland, dry/moist/wet grassland, wetlands) within the New Largo MRA must be developed and implemented for the project prior to the commencement of mining.

Groundwater:

- Additional mine water generated from mining through the barrier of Pit D must managed by New Largo to ensure no mine affected water is released to the surrounding environment.

Social:

- The mitigation measures provided in the EMPR (Section Machinery, Equipment, Vehicle Movement and roads) addressing the potential safety and intrusion aspects relating to the trucking of coal on public roads must be adhered to, including transport contractors.
- Develop a livelihood restoration framework. The focus should not only be on eventual livelihood restoration, but also on resolving emerging project-related livelihood implications, including subsistence farming impacts

10.8 Period for which the Environmental Authorisation is required

The mining operation is expected to continue for about 50 years and it is requested that this authorisation remain in effect for at least **50 years**.

10.9 Undertaking

It is confirmed that the undertaking required to meet the requirements of this section is provided at the end of the EMPr (**Part B**) and is applicable to both the EIA Report and the EMPr Report.

10.10 Other Matters Required in Terms of Section 24(4) of the NEMA

This section requires proof of compliance with section 24(4)(b)(i) of the National Environmental Management Act, which section reads as follows:

“24. Environmental authorisations

(4) Procedures for the investigation, assessment and communication of the potential consequences or impacts of activities on the environment -

(b) must include, with respect to every application for an environmental authorisation and where applicable-

(i) investigation of the potential consequences or impacts of the alternatives to the activity on the environment and assessment of the significance of those potential consequences or impacts, including the option of not implementing the activity;”

The above requirements are dealt with comprehensively in Section 10.7 of this EIA/EMPr report.

PART B
ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

11.0 ENVIRONMENTAL MANAGEMENT PROGRAMME

11.1 Details of Environmental Assessment Practitioner

The required details have been supplied in **PART A**, Section 2.2 of this report.

11.2 Description of the Aspects of the Activity

See 4.0 of this document.

11.3 Composite Map

The locality map for New Largo Coal Mine can be seen in Figure 1 while Figure 10, Figure 11 and Figure 1 depict the layouts of Pit H, Pit D and the main mine. The MRA (including Pits H and D) in relation to the environmentally sensitive areas is indicated in Figure 12.

11.4 Impact Management Objectives and Statements

By committing to the implementation of the management measures described in the EMPr and the conditions stipulated in the EA and the Water Use Licence, New Largo intends to ensure that the local environmental quality are not be adversely affected by the construction, operation and decommissioning of the New Largo mine and that the positive impacts will be enhanced as far as practicable.

11.4.1 Construction Phase

The predicted impacts, recommended mitigation measures and expected outcomes are dealt with in Section 11.6.

11.4.2 Operational Phase

The predicted impacts, recommended mitigation measures and expected outcomes associated with this phase are dealt with in Section 11.6.

11.4.3 Closure Phase

The predicted impacts, recommended mitigation measures and expected outcomes associated with this phase are dealt with in Section 11.6.

11.4.4 Water Use Licence

New Largo operates under the following WULs:

- WUL: 04/B20G/ACFGIJ/2538, File: 16/2/7/B200/C528 dated 11 January 2015 (Integrated WUL);
- WUL: 04/B20G/CI/2246, File: 16/2/7/B200/C528 dated 22 August 2014 (R545 Provincial Road Re-alignment); and
- WUL: 04/B20F/ACFGI/2310, File: 16/2/7/B200/K524 dated 22 September 2013 (Phola – Kusile Conveyor).

New Largo has recently submitted to the DWS an amendment for the integrate WUL to include Section 21 (a), (g) and (j) water uses, and a separate application for Section 21(c) and (i) water uses for mining through the Honingkrantz Pan.

Furthermore, a WUL application for Pit H is also going to be submitted, for the following water uses, which were not covered in the existing licences:

- Section 21 (a) taking water from boreholes (NSW10 and NSW2) and from the existing in-stream dam 1 and dam 2;
- Section 21 (f) discharging form the sewage treatment works;
- Section 21 (g) for the conservancy tank (during initial phase) x2 PCD's, dust suppression and the in-pit mineral residue disposal; and
- Section 21 (j) dewatering of Pit H.

11.5 Potential Impacts to be Mitigated

The potential impacts to be mitigated are described in detail in Section 9.4 and Appendix F of this Amendment to the EMPr.

11.6 Summary of mitigation and monitoring measures

A summary of the appropriate mitigation measures to manage the identified impacts and monitoring measures are presented in Appendix F. Responsibilities for implementing the mitigation measures are identified and the frequencies with which the results of the various measures are to be monitored are included.

The ultimate responsibility for implementation of the EMPr rests with New Largo Coal. Individual appointments, roles and responsibilities of the following parties are also outlined:

- Environmental Control Officer (ECO);
- Environmental Auditor (EA);
- Environmental Monitoring Committee;
- Contractors;
- Contractor SHE Officer;
- New Largo Coal Project Manager (PM);
- Third-Party Infrastructure Owners;
- Public / Community Liaison Officer;
- Competent Authorities for the Project; and
- Environmental Assessment Practitioner responsible for preparing the EMPr.

The environmental monitoring committee (EMC) has been established and will meet on a quarterly basis for the first two years and bi-annually thereafter, and will be chaired by a neutral independent facilitator. The purpose of this EMC will be multi-facetted but it is envisaged that this body will be the main driving force ensuring the effective implementation of all commitments contained within the EMPr and associated permitting documents.

12.0 FINANCIAL PROVISION

A closure report in accordance with the NEMA Financial Provision Regulations was compiled in 2019 (Golder, 2019b) for the main New Largo mine, and in 2018 for Pit H (Golder, 2018). A standalone closure report was

compiled in 2020 for the purposes of this EMPr Amendment, based on the two aforementioned documents, and is appended in Appendix E.

12.1 Closure Objectives

The initial closure philosophy and objectives below have been developed to guide the closure measures to be implemented on site towards achieving the above closure vision. The closure objectives are as follows:

- **Physical stability:** to remove and/or stabilise/rehabilitate surface infrastructure, unavoidable mining residue and open pits that are present on the mine and to facilitate the implementation of the planned next land use;
- **Environmental quality:** to ensure that local environmental quality is not adversely affected by possible physical impacts and chemical contamination arising from the rehabilitated areas and that catchment yield is sustained as far as possible;
- **Health and safety:** to limit the possible health and safety threats to humans and animals using the rehabilitated mine site as it becomes available;
- **Land capability/land-use:** to re-instate suitable land capabilities over the rehabilitated portions of the mine site;
- **Aesthetic quality:** to leave behind a rehabilitated mine site that, in general, is not only neat and tidy with an acceptable overall aesthetic appearance, but which is also aligned to the respective land uses;
- **Biodiversity:** to encourage, where appropriate (for example in riparian corridors), the re-establishment of native vegetation on the rehabilitated mine sites, such that the terrestrial biodiversity is largely re-instated over time; and
- **Social:** to ensure that the infrastructure transfers (if any), and measures and/or contributions made by the mine towards the long-term socio-economic benefit of the local communities are sustainable, and aligned to the detailed socio-economic mine closure plan.

12.2 Rehabilitation Plan

The Closure report undertaken in 2020 (Appendix E) outlines that the way soils are managed during the mining operations dictates, to a large extent, the post mining land capability and thus the end land use potential that can be achieved. It also has a significant impact on the groundwater infiltration and the overall water make of the entire mining area and will affect the quantity and quality of water make at the mine, not only during the life of the mine, but for many years post closure.

There is direct trade-off between the costs of soil management during the operating phase of the project on the one hand, and the end land use potential and cost of post closure water treatment on the other hand.

This section summarises pertinent information that was included in the main pit closure plan (Golder, 2019b).

12.2.1 Rehabilitation Sequencing

The proposed rehabilitation sequence as described below is based on the mining methods employed. The spoil and discard handling sequence includes the following:

- Mined out areas to be backfilled and rehabilitated concurrently during operations and as soon as practically possible at closure;
- Rehabilitated spoils to be layered as far as possible, with hard overburden at the bottom of the spoils. Partial spoiling of soft/hard overburden will occur due to the limitations of dragline activities, but the highly weathered soft material should as far as practically possible be placed on the top;

- All mineral residue, low grade coal and/or coal discard will be backfilled[3] into the open pit as per the compartments indicated in the EIA report (Synergistics, 2012);
- Discard will be placed in the bottom of the pit, on the No. 2 coal seam floor (bottom coal seam) and spread in thin layers;
- Discard layer thicknesses should be minimised but to take cognisance of the overall available space in the mine pit and decant points. Layer thicknesses not to exceed 2.5 m;
- Discard to be compacted, either by traversing earthmoving equipment or dedicated compaction equipment;
- Discard to be covered with spoils as soon as practically possible but should not be left exposed longer than the time taken for heating to occur, in order to prevent spontaneous combustion.
- Adhere to spontaneous combustion management measures;
- Dragline spoil levelling will take place utilising the Komatsu D475 and three Komatsu D375 dozers once sufficient space is available for concurrent rehabilitation;
- Partial spoiling of soft/hard overburden will occur due to the limitations of dragline activities, but the highly weathered soft material should as far as practically possible be placed on the top;
- Manage backfilling operations to optimize even compaction and reduce oxygen and water ingress;
- Live placement of pre-strip material over the levelled areas will be done to the pre-determined post mining landform design elevations; and
- Live placement of topsoil will be done to areas and depths as a final rehabilitation layer, as specified by dedicated topsoil stripping and placement plans to be developed.

12.2.2 Topsoil Management

Restoring land capabilities and land uses post closure will require operational accuracy in constructing the post mining landform and managing topsoil resources throughout the LoM. Stripping and storing different soil types separately and ensuring that usable topsoil is not over stripped and mixed with subsoils is a key component of effective rehabilitation. The topsoil management philosophy outlined in the 2012 EIA/EMPr should be refined to ensure that the mixing between various soil materials does not occur. Golder developed a topsoil balance and stripping plan based on actual topsoil depths for Pit H and the main mine. The topsoil stripping plan should be expanded to include a topsoil placement plan. Both the topsoil stripping and topsoil placement layers should be submitted to the mining planners for inclusion in future scenarios and detailed planning for implementation.

The 2012 EIA/EMP indicated that the majority of soil forms encountered in the study area are of the orthic phase. These include Hutton, Clovelly, Griffin, Glencoe and Mispah. Some hydromorphic soil forms were also identified, including the Pinedene, Avalon, Bloemdal, Longlands, Westleigh, Kroonstad, Rensburg, Bonheim and Katspruit. Although the 2012 planning was based on soil depths only, the recommended methodology involves handling the arable (orthic) soils separately from the wetland (hydromorphic) soils.

Post-mining land capability classes in terms of topsoil thickness replaced on top of the levelled spoil material were defined in 2012 based on the then Chamber of Mines Guidelines, and included:

- Arable: 600 plus mm

[3] It is noted that the backfilled material will not be fully flooded when steady state conditions are achieved, and this will impact on the water quality of the excess mine water make requiring treatment

- Grazing: 300-600 mm
- Wilderness: 100-300 mm
- Wetland: 300 mm (post-mining drainage zones covered with pre-mining wetland soil types).

12.2.3 Stormwater Management

The following actions are required to address risks related to storm water management:

- Identify and address the areas with a potential high drainage density and storm water velocity through an iterative process of testing and adjusting/refining the post mining landform design with storm water and erosion modelling;
- Construct additional storm water measures where required based on detailed hydrological calculations and engineering designs;
- Design the post mining landform based on sound geomorphological principles to limit the requirement for constructed measures that could fail or might require ongoing maintenance;
- Provide clean and dirty water separation measures during operations to limit soil loses due to erosion and contamination; and
- Re-vegetate all rehabilitated areas as soon as practically possible.

12.2.4 Vegetation Establishment

The following measures are required:

- Site specific rehabilitation methodologies and strategies should be developed that are aligned with the desired end land capability (leverage learnings from other operations);
- Develop operational procedures and train operators and supervisors;
- Define soil amelioration specifications based on dedicated fertility monitoring and keep records of specialist recommendations and fertiliser applications;
- Source fertiliser and seed mixtures from reputable companies to ensure quality and rehabilitation success;
- Implement revegetation measures on all rehabilitated areas as soon as possible, typically including (but not limited to) the following:
  - Deep ripping of all placed soils for effective compaction alleviation;
  - Disc and scarify the ripped area to prepare the seedbed;
  - Apply a suitable seed mixture and soil amelioration based on dedicated fertility sampling and analysis; and
  - Seeding should be done between November and mid-January taking cognisance of rainfall (early season seeding results in more successful rehabilitation outcomes).
- Apply follow up seeding and soil amelioration based on monitoring results; and
- Implement land management measures based on the land capability and intended land use.

12.2.5 Monitoring and Maintenance

The following monitoring is required during the operational phase to ensure appropriate rehabilitation implementation and to ensure that objectives set out in the 2019 Closure Plan (Golder Associates, 2019) are systematically achieved over the LoM:

- Develop sign-off criteria for levelled/backfilled areas that must include comparing the monthly survey data (as-built surfaces) to the post mining landform design elevations;
- Monitor all aspects of topsoil stripping, stockpiling and placement to ensure procedures are followed and soils are placed to prescribed areas and depths;
- Annually conduct land capability assessments of newly rehabilitated areas to determine and map the actual soil depths towards incrementally developing a post mining land capability plan.
- Rehabilitation performance monitoring (including vegetation and soil fertility monitoring and carrying capacity assessments) of all rehabilitated areas for a period of 5 years following revegetation;
- Maintenance and after care of rehabilitated areas will continue for a minimum period of 5 years after revegetation to confirm that relinquishment criteria have been achieved;
- On-going maintenance to maintain grass cover vitality at rehabilitated areas; and
- Maintain the LoM topsoil balance based on monthly survey data and amend as required to ensure efficient use of topsoil resources for rehabilitation and closure purposes.

12.3 Closure costs

The scheduled closure costs for the full mine, as at October 2020, are summarised in Table 24 (the assumptions and qualifications are outlined in the full report in Appendix E).

Table 24: Scheduled closure costs as at October 2020

19119420 New Largo Coal (Pty.) Ltd: New Largo Mine Closure Costs, as at October 2020			
Closure components		**Scheduled Closure Costs**	
1	Infrastructural areas	R	144 515 694
2	Mining areas	R	145 299 757
3	General surface rehabilitation	R	19 127 180
4	Water / runoff management	R	-
	Sub-Total 1	**R**	**308 942 631**
5	**Post-Closure Aspects**		
5.1	Surface water monitoring	R	876 621
5.2	Groundwater monitoring	R	254 271
5.3	Rehabilitation monitoring	R	4 139 082
5.4	Care and maintenance	R	86 933 000
5.5	Post closure water treatment	R	54 674 171
	Sub-Total 2	**R**	**146 877 145**
6	**Additional Allowances**		
6.1	Preliminary and general	R	46 341 395
6.2	Contingencies	R	30 894 263
6.3	Additional studies	R	1 500 000
	Sub-Total 3	**R**	**78 735 658**
	Grand Total Excl. VAT. (Sub-total 1 +2 +3+4)	**R**	**534 555 434**

If it is assumed that a closure certificate is granted to New Largo 10 years after closure, then the residual water treatment costs (net present value) for the operational expenditure for the treatment of extraneous water for a period of 100 years, and the subsequent demolition and removal of the treatment plant amount to **R114.34 million** for the New Largo main mine. In terms of the Financial Provisioning Regulations 2015, as amended, financial provision will have to be made to the DMRE for the residual costs.

General costing assumptions

- The unit rates are third-party contractors' rates. The August 2019 base rates that underpinned the 2019 closure costing update for the main pit area were escalated to October 2020.
- The closure costs for the site could comprise a number of cost components. This report only addresses the decommissioning and rehabilitation costs, equating to an outside (third party) contractor establishing on-site and conducting the outstanding rehabilitation-related work.
- Based on the above, dedicated contractors would be commissioned to conduct the demolition and rehabilitation work on the site. This would inter alia require establishment costs for the contractors and hence, the allowance for preliminary and general (P&Gs) in the cost estimate.
- It was assumed that all metal and steel waste will be salvaged, although it is expected to be minimal. No allowance was made to offset the salvage value of the scrap metal against the demolition costs.
- Allowance has been made for third party contractors and consultants to conduct care and maintenance work, as well as compliance monitoring, following the rehabilitation of outstanding items.
- The closure costs were only computed for the scheduled closure situation. The unscheduled closure costs (excl. Pit H) were computed as at December 2019 (Golder Associates, 2019), and the mine-wide unscheduled closure costs will be updated

Infrastructure layouts

- Although some minor changes were made to the infrastructure layouts for the main pit and Pit H; the types and sizes of the infrastructure components were similar to the previous version of the designs that were included in the BFS. Given the required accuracy levels prescribed by the GN.R. 1147 for a mine with a remaining life of more than 30 years (pre-conceptual or -50%+50%), the minor changes will not have a material impact on the closure costs and hence the quantities as determined for the main pit infrastructure in 2019 (Golder Associates, 2019) and for Pit H in 2019 (Golder Associates, 2019b) were adopted with this assessment, with the addition of an allowance for the demolition of the destoning plant at Pit H.

Waste management and mine residue

- The assumptions regarding demolition waste and mine residue as described in the 2019 closure plan (Golder, 2019b) are relevant to this report.

Open pit rehabilitation

- Given that both Pit D and Pit H will be mined during the first stages of mining, it is assumed that it will be fully rehabilitated at the time of scheduled closure and hence no costs associated with open pit rehabilitation of Pit H or Pit D were included in the scheduled closure costs. Consequently, the change in the mine schedule and mining fleet at Pit H and Pit D (opting for truck and shovel and not conducting any dragline operations) will not have an impact on the closure costs for Pit D and Pit H.
- The mass earth works are areas for the rehabilitation of the remaining void and ramps (Eastern and Western) and were quantified by New Largo based on the dedicated post mining landform design updated for Rev 6 of the 2019 mining plan. Given that dragline operations will still be conducted during the latter

part of the life of mine, the position, size and location of the final voids will remain the same as in the 2019 assessment and hence the same quantities were adopted;

- The costing is based on equipment and percentage split specified by New Largo in 2019;
- For the purpose of the closure costing for the final void, it has been assumed that topsoil will be replaced to a depth of 500 mm across the backfilled and shaped areas, ripped and revegetated.
- As mentioned in the closure scenario, it is assumed that there will be no operational rehabilitation backlogs present at scheduled closure, and that the rehabilitation performance of the rehabilitated open pits will have been monitored during operations and that adequate care and maintenance would be conducted throughout operations so that no additional soil amendment or corrective action would be required at scheduled closure in order to support the suite of identified next land uses. No allowances have been made for the implementation of the next land uses; as it is assumed that it will be conducted by third parties.

Main mine area water balance

- From the water balance that was developed for the main mine area in 2019, the following assumptions have been made:
  - The decant volumes for the main mine area (comprising Pit A (including the Honingkrantz Pan), Pit G, Pit C, Pit E, Pit D, Pit F) was determined in 2019. The water balance for the main mine excluded Pit H and the Pit D extension. The decant flow was determined as 12ML/d from 2071.
  - The recharge water from the Pit D extension to be mined will also report to the low point (the low point in the seam floor in the North of Pit D). The groundwater model estimated 300 m³/d would report to the low point from the Pit D extension workings. Hence, the flow from the Pit D extension will be added to the flow determined used in the model will be increased to 12.3 ML/d.
  - The LOM plan (block plan) that has been amended will not necessarily impact on the time available until decant and hence it has been assumed that decant will commence, as previously assumed, in 2071 (for scheduled closure).
  - The decant water quality has not yet been modelled/predicted, however, given the in-pit disposal of discard in areas where it will possibly not be flooded it will likely impact on the feed water quality to the water treatment plant.
- Operational water treatment:
  - A mobile water treatment plant (WTP) will be required early on to allow time for the water balance to be better understood and to get more information on the water quality of the WTP feed water to inform the design of the permanent WTP (Golder Associates, 2020b);
  - The WTP must be constructed in modules so that the modules can be switched on and off in response to the water that requires treatment. The startup 4000 m³/d mobile plant should be in two 2000 m³/d modules. The WTP should include its own brine management process (Golder Associates, 2020b);
  - At the end of the life of mine the water treatment plant will have reached the end of its life and it will not be feasible to use this plant in the post closure period.
- Given the above context, the following assumptions have been made in respect of the post mining water treatment of the main mine area (including the Pit D extension):

- Water treatment will commence during operations and continue directly after closure (anticipated in 2070) at a rate of 12.3 ML/d for a period of about 10 years (2071- 2080), with the assumption that New Largo will be granted a closure certificate in 2080;
- The above WTP would have been operational until being replaced or refurbished in 2080 by a WTP for treatment of excess mine water at a 12.3 ML/d capacity. This WTP will remain operational for a period of 100 years post closure (2081-2181)
- The capital expenditure for the WTP to be constructed in 2080 along with the operational costs for the first 10 years post-closure and the subsequent 100 years post closure are included in the costing;

- The feed water quality as input to the water treatment model was assumed to be 200 mg/L acidity (CaCO3) and 4500 mg/L salinity (dissolved solids). Allowance is made to dispose of salts generated in the process at a registered hazardous waste facility (Holfontein) assuming an evapo-crystaliser is used; and
- An allowance has been included to decommission and demolish the related infrastructure and rehabilitate all remaining footprints.

Pit H water balance

- From the Pit H water balance was developed in July 2020 , the following assumptions have been made:
  - The decant point of the pit is located in the north western corner at an elevation of 1539.78 mamsl.
  - No new information on the timing of decant or the decant water qualities were available and hence the input that was used for the Pit H closure costs in 2019 was still deemed appropriate
  - Although the Pit H water balance found that the average groundwater inflows for the LOM were 3.9 L/s and 92 L/s (338 m3/d and 797 m3/d) for the low and high flows (JMA Consulting, 2012), the water balance did not indicate the expected decant volumes and the time available until decant, and hence the decant flow was still assumed as 1197m³/d (for scheduled closure) as determined indicative as part of the closure input in 2019.
  - The water treatment model was based on an operating life of 14 years and time available until decant of 48 years (thus 2069).
  - Given that Pit H will start decanting before closure of the mine it is assumed that the decant will be treated by a mobile treatment plant as per the approach taken with the 2019 Pit H closure input.

Wetlands and pans

- The pan mitigation authorised by the 2012 EMP included the development of a wetland offset strategy to compensate for the loss of the Honingkrantz pan.
- In addition to the development of the offset strategy, it is likely that there could be other requirements stemming from the WUL application for the mining of the Honingkrantz pan. In support of the WUL application, the loss of the Honingkrantz Pan is planned to be compensated for by the creation of a wetland system comprising a stormwater attenuation facility at the edge of the rehabilitated mining pit. The attenuation facility will spill/discharge in a controlled manner to a series of constructed wetlands mimicking different wetland habitats located downgradient of the attenuation facility (Wetland Consulting Services, 2020). It was also recommended that the mine plan be amended to exclude the rocky outcrops that occur on the eastern boundary of Pit A and that feed springs in this area. An ecological management plan to control alien vegetation, manage the rocky ridge habitat, discharge points etc. will be required.

- Given that the WUL for the mining of the pan has not been authorised as yet, the inclusion of these additional mitigation measures into the closure framework and closure costs are seen as premature, and at this stage, no closure costing allowances have been made for the implementation of such additional mitigation measures. Additionally, it is likely that the additional mitigation measures, if required, would be implemented during operations and would consequently not have an impact on the closure costs (unless long-term maintenance and monitoring is required).

In view of the above considerations, allowance has only been made for the development of a wetland offset strategy. Future updates of the mine closure costs need to consider new wetland rehabilitation commitments/requirements as and when the authorisations are issued

12.4 Actions Required

To guide the determination of scheduled closure costs, the likely closure scenario has been defined in terms of the following (Golder Associates, 2019):

- **Remaining operational period until cessation of operations** that allows for the execution of routine closure-related work as part of operations, as far as possible, to limit the remaining closure costs at LoM; and
- **Closure period and beyond** that allows for the mine site to be handed over to the closure contractor(s), if a mine owner's team does not do the closure work, once most operational personnel have left the site, to implement the closure measures and related engineering in terms of the final closure plan.

The closure scenario is based on the LoM, mining planning and the battery limits for closure, focusing specifically on the following key aspects:

- Infrastructure and plants;
- Shafts (historical);
- Stockpiles;
- Ponds and impoundments;
- Open pits;
- Waste and contaminated land;
- General surface infrastructure; and
- Water management.

The full report can be found in Appendix E.

13.0 ENVIRONMENTAL AWARENESS PLAN

The environmental awareness plan has been included in the EMP mitigation table (Appendix F).

14.0 UNDERTAKING REGARDING CORRECTNESS OF INFORMATION

The environmental assessment practitioner hereby confirms:

- The correctness, to the best of her knowledge, of the information provided in the specialist reports and of information provided by New Largo Coal. The information was accepted as being as reliable as information generated during an EIA and a feasibility study, and provided in good faith, can be;
- The inclusion of comments and inputs from stakeholders and I&APs;
- The inclusion of inputs and recommendations from the specialist reports where relevant; and
- That the information provided to I&APs and the responses to comments and inputs made by the I&APs are correctly reflected herein.

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APPENDIX A

CV of EAP

APPENDIX B

List of Properties and Listed Activities

APPENDIX C

22012 EIA for New Largo Colliery by Synergistics, including specialist studies, and public participation report

APPENDIX D

2020 Public Participation Process

APPENDIX E

Updated Specialist Studies undertaken in 2020

APPENDIX F

Impact Assessment, Mitigation and Monitoring Tables

APPENDIX G

Existing Environmental Authorizations

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