

BIODIVERSITY MANAGEMENT

Operation	Is the operation in close proximity to area of high biodiversity or protected area?	Biodiversity study completed	Details of Red Data or protected species	Status of Biodiversity Action Plan (BAP)	Strategies for addressing impact
ARM PLATINUM DIVISION					
Nkomati Mine					
<p>12 hectares were disturbed during F2018.</p> <p>A total of 449 hectares have been disturbed to date. 88 hectares of the disturbed footprint will be part of the pit lake, thus resulting in 349 hectares of land to be rehabilitated at the end of life of mine.</p> <p>6 hectares were rehabilitated during F2018.</p> <p>No communities were resettled in FY2018.</p>	<p>No. The mine is located among commercial forestry operations.</p>	<p>Yes.</p>	<p>No Red Data species.</p>	<p>In terms of the BAP, priority actions completed and in progress, include:</p> <ul style="list-style-type: none"> o A continuous programme for the removal of alien invasive plants; and o Concurrent rehabilitation of disturbed land, which no longer falls within the mining plan (waste rock dumps and tailings storage facilities). 	<p>Integration into local municipal policy and plans, as well as relevant Spatial Development Plans; integration into existing Group policy and management systems, including the Biodiversity and Land Management Plan, Closure Plan and Environmental Management Plan; identification and liaison with stakeholders and neighbouring properties especially with respect to weed/invader and erosion control action plans; post closure land use; and available budget and manpower for implementation, management and maintenance. In terms of water management, a geo-hydrological model and update of the surface water management plan and water balance are in place and are being updated regularly.</p>

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ARM PLATINUM DIVISION continued					
Two Rivers Platinum Mine					
<p>No additional land was disturbed during F2018, while 0.75 hectares of the tailings storage facility (TSF) was rehabilitated and vegetated. The current estimate of land disturbed and not yet rehabilitated is approximately 250 hectares.</p> <p>No communities were resettled in F2018.</p>	<p>Yes. The mine is located within the Sekhukhune Land Centre for Plant Endemism, which is an area of high biodiversity.</p>	<p>Yes.</p>	<p>Priority Red Data plants: <i>Gladiolus</i> sp.nov, <i>Resnova</i> sp.aff.megaphylla, <i>Zantedeschia pentlandi</i> while protected fauna are cicada (<i>Pycna Sylvia</i>), <i>Dromica honesta</i>.</p> <p>Other conservations: Important invertebrates confirmed during field work are scorpion species such as <i>Hadogenes ploytrichobothrius</i> (flat rock scorpion), <i>Opisthophthalmus gladifrons</i>, <i>Parabuthus transvaalicus</i>, <i>Uroplectes triangulifer</i> and <i>Pseudolychas</i>. A newly described protected mite species called <i>Zambedaniasp. (hetrostigmae)</i> associated with a certain spider species (inhabiting under round shaped stones that are fairly deeply buried up to 1/3 or 1/2 of their depth) called <i>Harpactrella flavipilosa</i>. Ant species confirmed and potentially undescribed, collected during the invertebrate survey, include undescribed <i>Tetramonium</i>, undescribed <i>Camponotus</i>, undescribed <i>Anilmyrma</i>, possibly undescribed <i>Meranoplus</i>, and possibly undescribed <i>Aenictus</i>. The property is dominated by thick leafed plants, most of which occur in the Sekhukhune Land Centre for Plant Endemism.</p>	<p>The Two Rivers Mine BAP has been expanded to cover an additional 650 hectares of the farm De Grooteboom, which is the approved site for the new TSF.</p> <p>Plans are in place to consider expanding the BAP further to include the farms Kalkfontein, Buffelshoek and portions of Tweefontein – upon the incorporation of the Kalkfontein RE Block mining right into the Two Rivers Mine mining right and/or execution thereof.</p>	<p>The BAP is still a pivotal environmental management instrument for the mine and will remain as such. The benefits of having this as an environmental management Instrument will increase upon inclusion of the three outstanding farms – Kalkfontein, Buffelshoek and portions of Tweefontein.</p>

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Two Rivers Platinum Mine continued					
			<p>A new species, <i>Boloponera</i> ant species, a genus previously known only from a single specimen from the Central African Republic, was discovered just outside the new TSF site (De Grootboom).</p> <p>Woodland dominant within the property are:</p> <ul style="list-style-type: none"> o <i>Lydenburgia-Euclea</i> Open Woodland – within which the protected <i>Lydenburgia</i> <i>assinoides</i> plant specimens are dominant; o <i>Sclerrocarya – Bolusanthus</i> Open Woodland within which <i>Sclerrocarya birrea subsop, caffra</i> (Marula tree) is dominant; o <i>Combretum erythphyllum</i> Riverine Woodland within which <i>Combretum</i> specimens are dominant; and o <i>Phragmites – Imperata</i> Marsh wherein <i>Phragmites</i> species are dominant. 		

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ARM PLATINUM DIVISION continued					
Modikwa Mine continued					
<p>1.35 hectares were disturbed during F2018.</p> <p>A total of 558.6 hectares have been disturbed.</p> <p>No communities were resettled in F2018.</p>	No.	Yes.	<p>An assessment of protected trees was conducted as part of an Environmental Impact Assessment related to a community road and the following specific tree species were identified and marked for protection along the road.</p> <ul style="list-style-type: none"> o <i>Slerocarya birrea</i>. Caffra (Marula); o <i>Combretum imberbe</i> (Leadwood) o <i>Catha edulis</i> (Bushman's tea); o <i>Lydenburgia cassinoides</i> = <i>Catha transvaalensis</i> (Sekhukhune Bushman's tea); o <i>Searsia batophylla</i> (Red berry); and o <i>Searsia sekhukhuniensis</i> (Sekhukhune-karee). 	The BAP was revised and an alien invasive species eradication plan/survey was conducted during F2017.	<p>The BAP implementation plan will be reviewed in line with the mine closure plans/objective in F2018. The document at this stage cannot be implemented in Isolation given the land ownership and agreements in place for Modikwa Mine.</p> <p>Eradication of alien invasive plants project was completed and re-growth is being monitored. The implementation of the BAP continues.</p>

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ARM FERROUS DIVISION					
Cato Ridge Works					
<p>No additional land was disturbed during F2018. A total of 108 hectares have been disturbed and not yet rehabilitated.</p> <p>No communities were resettled in F2018.</p>	<p>Protected Ngonigoni grasslands, to the south and south-east of the operations.</p>	<p>Yes.</p>	<p>Protected Ngonigoni grasslands.</p> <p>The biodiversity study indicated that none of the Red Data species which could potentially occur in the region, actually occur on site.</p>	<p>Completed.</p> <p>A biodiversity impact study confirmed that no significant impact to the Ngonigoni grasslands would be caused due to historic and current disturbance by activities such as cattle grazing. A memorandum of agreement was signed between Cato Ridge Works, the Wildlands Trust and the e-Thekwini Municipality whereby Cato Ridge Works will financially sponsor the Wildlands Trust to conserve grasslands in the Inanda Dam area.</p>	<p>Implementation of the BAP continues.</p>
Machadodorp Works					
<p>No additional land was disturbed during F2018. A detailed contaminated land assessment was done in F2015 and the total disturbed land is 122 hectares. Approximately 4 hectares have been rehabilitated.</p> <p>No communities were resettled in F2018.</p>	<p>Yes. The smelter is within the proposed Lydenburg Centre of Endemism.</p>	<p>Yes.</p>	<p>None.</p>	<p>The BAP was completed in 2011. Monitoring was done during the summer of 2012 and the BAP was updated accordingly. The updated Plan indicated an improvement in the ecological state in one of the four management units. The status remains the same in all four sectors in F2018. Invader species are monitored and controlled as required.</p>	<p>Implementation of the BAP has been completed and monitoring continues.</p>

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ARM FERROUS DIVISION continued					
Black Rock Mine					
<p>31.32 hectares were disturbed during F2018. A total of 743.4 hectares have been disturbed to date.</p> <p>0.17 hectares were rehabilitated during F2018 and a total area of 12.46 has been rehabilitated to date.</p> <p>No communities were resettled in F2018.</p>	No.	Yes.	<p><i>Acacia erioloba</i> (Camel thorn), <i>Acacia haerματοxylon</i> (Grey Camel thorn) <i>Boscia albitrunca</i> (Shepherd tree), <i>Ammocaris coranica</i> (Karoo lily) and <i>Harpagophytum procumbens</i> (Devils claw). The only threatened mammal species found are bats.</p>	Completed and being implemented.	Implementation of the BAP is in progress (including the management of alien and invasive vegetation). Monitoring is done on a continual basis.
Beeshoek Mine					
<p>No additional land was disturbed during F2018. A total of 1995 hectares have been disturbed to date.</p> <p>10 hectares were rehabilitated during F2018 and a total of 40 hectares have been rehabilitated to date.</p> <p>No communities were resettled in F2018.</p>	No.	Partially completed. Plan to do the rest in stages due to economic constraints.	Seven endemic and near-endemic plant species have been identified, including various aloes, shepherd trees and camel thorn trees.	The BAP was revised to include the expansion area. Implementation of the BAP is in progress.	<p>Continuous monitoring of impacted areas. Offset and relocation of plants in terms of the road diversion has been completed. For the Village Pit mining area, the replacement plan for protected species was implemented with limited success.</p> <p>The following were focus areas in F2018:</p> <ul style="list-style-type: none"> ○ Identification of ecosystem types to conserve specific habitats; ○ Improving biodiversity through alien plant management, concurrent rehabilitation, fence and problem animal control; ○ Monitoring of key species and habitats (Camelthorn trees, pans, ridges); ○ Focused awareness campaign for biodiversity; and ○ Strategic approach to build relationships with neighbouring landowners to manage biodiversity.

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ARM FERROUS DIVISION continued					
Khumani Mine					
<p>3 870 hectares have been disturbed.</p> <p>18.1 hectares were rehabilitated and 43.7 hectares were disturbed in F2018.</p> <p>No communities were resettled in F2018.</p>	No.	Yes.	<p>The biodiversity survey conducted during 2017 identified the followings protected species expected to occur/occur within the surface rights.</p> <ul style="list-style-type: none"> ○ <i>Aloe grandidentata</i> (Bontaalywn) ○ <i>Aloe claviflora</i>, (Kraalaalwyn) ○ <i>Aloe hereroensis</i> (Sandaalwyn) ○ <i>Ammocharis coranica</i> (Berglelie) ○ <i>Babiana hypogaea</i> (Bobbejaanuitjie) ○ <i>Boophane disticha</i> (Sore eye flower) ○ <i>Crinum bulbispermum</i> (Orange river lily) ○ <i>Fockea angustifolia</i> (Kombu) ○ <i>Harpagophytum procumens</i> (Devil's claw) ○ <i>Hoodia gordonii</i> (Ghaap) ○ <i>Huerniopsis decipiens</i> (Aasblom) ○ <i>Lithops aucampiae</i> spp. <i>aucampiae</i> (Stone plant) ○ <i>Mestoklema arboriforme</i> (Donkievygie) ○ <i>Nerine laticoma</i> (Vlei Lily) ○ <i>Orbeopsis lutea</i> (Geelaasblom) ○ <i>Vachelia erioloba</i> (Camel thorn) ○ <i>Vachelia haematoxylon</i> (Grey camel Thorn) ○ <i>Boscia albitrunca</i> (Shepherd tree) ○ <i>Stapelia olivacea</i> (Swartaasblom) 	Completed.	<p>Impact managed in terms of commitments in terms of the EMP. Plants are removed before mining.</p> <p>The mine has established a biodiversity offset area in collaboration with the Department of Environmental Affairs and the Department of Nature Conservation in the Northern Cape. The area has been registered as a conservancy.</p>