

Appendix G2 : Impact Assessment (Preferred alternative assessed – construction and operational phases and the No-Go Alternative impacts)

Table 1: Impact Assessment of Impacts during the Construction Phase

ENVIRONMENTAL ASPECT	NATURE OF THE IMPACT	IMPACT STATUS	MAGNITUDE	EXTENT	DURATION	REVERSIBILITY	IRREPLACEABILITY	PROBABILITY	SIGNIFICANCE	MITIGATION POTENTIAL	SIGNIFICANCE	CONFIDENCE RATING	CUMULATIVE IMPACTS
									PRE-MITIGATION		POST-MITIGATION		
GEOLGY AND SOILS	<p>Contamination of soils through:</p> <ul style="list-style-type: none"> • Indiscriminate disposal of waste; and • Accidental spillage of chemicals such as hydrocarbon-based fuels and oils or lubricants spilled from construction vehicles and other chemicals from construction activities e.g. paints. 	-	5	2	1	3	11	4	Medium	High	Very Low	Sure	Very Low
HYDROLOGY GROUNDWATER SURFACE WATER	<p>Contamination of stormwater runoff and groundwater, caused by:</p> <ul style="list-style-type: none"> • Erosion; • Sediment release; • Chemicals such as hydrocarbon-based fuels and oils or lubricants spilled from construction vehicles; • Improper handling, storage and disposal of substances and hazardous chemicals; • Incorrect waste management; • Effluent discharges and seepage, due to a lack of stormwater management; • Pollutants from hazardous production waste and general waste generated on site. 	-	5	4	1	3	13	4	Medium	High	Low	Sure	Very Low
BIODIVERSITY	<p>Alien species may encroach onto the surrounding natural areas. Alien species generally out-compete indigenous species for water, light, space and nutrients as they are adaptable to changing conditions and are able to easily invade a wide range</p>	-	4	3	2	2	11	3	Low	High	Very Low	Sure	Low

ENVIRONMENTAL ASPECT	NATURE OF THE IMPACT	IMPACT STATUS	MAGNITUDE	EXTENT	DURATION	REVERSIBILITY	IRREPLACEABILITY	PROBABILITY	SIGNIFICANCE	MITIGATION POTENTIAL	SIGNIFICANCE	CONFIDENCE RATING	CUMULATIVE IMPACTS
									PRE-MITIGATION		POST-MITIGATION		
	of ecological niches. Alien invader plant species pose an ecological threat as they alter habitat structure, lower biodiversity (both number and “quality” of species), and change in nutrient cycling and productivity, and modify food webs. This negatively affects the ability of the disturbed area to maintain floral biodiversity, which will lead to the subsequent further degradation of the surrounding area.												
	Disturbance and loss of fauna through noise, light and air and water pollution and hunting, trapping and killing of fauna.	-	4	3	2	2	11	3	Low	Medium	Very Low	Sure	Very Low
ARCHAEOLOGICAL / HERITAGE RESOURCES	No cultural heritage resources occurs on site and it is highly unlikely that any objects will be uncovered or disturbed, as these objects generally occurs below ground level and no earthworks are planned as part of the construction / installation of the tank.	-	2	1	5	5	13	1	Very Low	Medium	Very Low	Sure	Very Low
VISUAL AND SENSE OF PLACE	No significant visual impact is expected to occur as a result from the installation of the LSR tank.	-	2	1	5	5	13	1	Very Low	Low	Very Low	Sure	Very Low
NOISE AND VIBRATION	Nuisance and health risks caused by an increase in the ambient noise level as a result of noise impacts associated with the construction vehicles and equipment and activities.	-	4	3	2	2	11	3	Low	Medium	Very Low	Sure	Very Low
	Disturbance due to vibrations caused by construction vehicles.	-	4	3	2	2	11	3	Low	Medium	Very Low	Sure	Low
AIR QUALITY	Fugitive dust emissions: Vehicle entrainment of dust from paved roads. On entering the TFC site, trucks delivering raw materials for use at the pelletising plant travel on a	-	5	4	1	3	13	4	Medium	Medium	Low	Sure	Low

ENVIRONMENTAL ASPECT	NATURE OF THE IMPACT	IMPACT STATUS	MAGNITUDE	EXTENT	DURATION	REVERSIBILITY	IRREPLACEABILITY	PROBABILITY	SIGNIFICANCE	MITIGATION POTENTIAL	SIGNIFICANCE	CONFIDENCE RATING	CUMULATIVE IMPACTS
									PRE-MITIGATION		POST-MITIGATION		
	section of paved road of approximately 400 m in length. These trucks have an average pay load of 28 tons and an average weight of 33 tons. Site specific particle size analysis determined the silt loading of the paved surface to be 307 g/m ² . The TFC entrance road is swept on a regular basis and a control efficiency of 75% were applied to emission calculations.												
	Vehicle entrainment of dust from unpaved roads. Raw material is delivered to the West Plant bunkers via truck. These trucks with a pay load of 28 tons and an average weight of 33 tons move on a section of unpaved road that is approximately 230 m long and passes in front of the West Plan bunkers. A 25% silt content of the material on the surface of the unpaved road section was determined through site specific particle size analysis.	-	5	4	1	3	13	4	Medium	Medium	Low	Sure	Low
WASTE	Generation of general waste, litter and building rubble and hazardous material during the construction phase.	-	4	3	2	2	11	3	Low	Medium	Very Low	Sure	Very Low
TRAFFIC	The change in traffic patterns as a result of heavy vehicles and other traffic entering and exiting the site, on the surrounding road infrastructure and existing traffic.	-	2	1	5	5	13	1	Very Low	Medium	Very Low	Sure	Very Low
	Access Control	-	5	2	5	5	17	4	High	High	Low	Sure	Low
HEALTH AND SAFETY	Possibility of construction activities and workers causing veld fires, which can potentially cause injury and or loss of life to workers and surrounding	-	5	2	5	5	17	4	High	High	Low	Sure	Low

ENVIRONMENTAL ASPECT	NATURE OF THE IMPACT	IMPACT STATUS	MAGNITUDE	EXTENT	DURATION	REVERSIBILITY	IRREPLACEABILITY	PROBABILITY	SIGNIFICANCE	MITIGATION POTENTIAL	SIGNIFICANCE	CONFIDENCE RATING	CUMULATIVE IMPACTS
									PRE-MITIGATION		POST-MITIGATION		
	landowners, visitors and workers.												
	Increased risk to public health and safety: Dangerous areas and activities poses health risks and possible loss of life to construction workers and visitors to the site.	-	5	2	5	5	17	4	High	High	Low	Sure	Low
	Security risks: Trespassing of workers on adjacent properties and possible crime e.g. poaching.	-	5	4	1	3	13	4	Medium	High	Low	Sure	Low
SERVICES	Damage or destruction of existing infrastructure in the near vicinity of the proposed activities. Impacts on existing infrastructure, services and servitudes.	-	5	4	1	3	13	4	Medium	High	Low	Sure	Low
SOCIO-ECONOMIC	Socio-economic impact on farmers and surrounding land owners and users due to negative impacts on groundwater, dust pollution, noise pollution etc.	-	4	3	2	2	11	3	Low	Medium	Very Low	Sure	Very Low

Table 2: Impact Assessment of Impacts during the Operational Phase

ENVIRONMENTAL ASPECT	NATURE OF THE IMPACT	IMPACT STATUS	MAGNITUDE	EXTENT	DURATION	REVERSIBILITY	IRREPLACEABILITY	PROBABILITY	SIGNIFICANCE	MITIGATION POTENTIAL	SIGNIFICANCE	CONFIDENCE RATING	CUMULATIVE IMPACTS
									PRE-MITIGATION		POST-MITIGATION		
GEOLOGY AND SOILS	Contamination of soils through: <ul style="list-style-type: none"> Indiscriminate disposal of waste; and Accidental spillage of chemicals such as hydrocarbon-based fuels and oils or lubricants spilled from delivery vehicles and other chemicals. 	-	5	2	2	3	11	4	Medium	High	Very Low	Sure	Very Low
HYDROLOGY GROUNDWATER SURFACE WATER	Contamination of stormwater runoff and groundwater, caused by: <ul style="list-style-type: none"> Erosion; Sediment release; Chemicals such as hydrocarbon-based fuels and oils or lubricants spilled from delivery vehicles; Improper handling, storage and disposal of substances and hazardous chemicals; Incorrect waste management; Effluent discharges and seepage, due to a lack of stormwater management; Pollutants from hazardous production waste and general waste generated on site. 	-	5	4	1	3	13	4	Medium	High	Low	Sure	Very Low
BIODIVERSITY	Alien species may encroach onto the surrounding natural areas. Alien species generally out-compete indigenous species for water, light, space and nutrients as they are adaptable to changing conditions and are able to easily invade a wide range of ecological niches. Alien invader plant species pose an ecological threat as they alter habitat structure,	-	4	3	3	2	12	4	Medium	High	Very Low	Sure	Low

ENVIRONMENTAL ASPECT	NATURE OF THE IMPACT	IMPACT STATUS	MAGNITUDE	EXTENT	DURATION	REVERSIBILITY	IRREPLACEABILITY	PROBABILITY	SIGNIFICANCE	MITIGATION POTENTIAL	SIGNIFICANCE	CONFIDENCE RATING	CUMULATIVE IMPACTS
									PRE-MITIGATION		POST-MITIGATION		
	lower biodiversity (both number and “quality” of species), and change in nutrient cycling and productivity, and modify food webs. This negatively affects the ability of the disturbed area to maintain floral biodiversity, which will lead to the subsequent further degradation of the surrounding area.												
	Disturbance and loss of fauna through noise, light and air and water pollution and hunting, trapping and killing of fauna.	-	4	3	2	2	11	3	Low	Medium	Very Low	Sure	Very Low
ARCHAEOLOGICAL/HERITAGE RESOURCES	No cultural heritage resources occurs on site and it is highly unlikely that any objects will be uncovered or disturbed, as these objects generally occurs below ground level and no earthworks are planned as part of the operational phase.	-	2	1	5	5	13	1	Very Low	Medium	Very Low	Sure	Very Low
VISUAL AND SENSE OF PLACE	No significant visual impact is expected to occur as a result from the installation of the LSR tank.	-	2	1	5	5	13	1	Very Low	Low	Very Low	Sure	Very Low
NOISE AND VIBRATION	Nuisance and health risks caused by an increase in the ambient noise level as a result of noise impacts associated with the construction vehicles and equipment and activities.	-	4	3	5	2	14	3	Medium	Medium	Low	Sure	Very Low
	Disturbance due to vibrations caused by delivery vehicles.	-	4	3	5	2	14	3	Medium	Medium	Low	Sure	Low
AIR QUALITY	Stack emissions (including NO _x , PM, NO ₂) including: <ul style="list-style-type: none"> - Off-gas from the sintering furnace’s heating, drying and sintering zones; - Off-gas from the sintered pellet handling plant (the screening station, product discharge points and conveyors); 	-	5	4	3	3	15	5	High	High	Low	Sure	Low

ENVIRONMENTAL ASPECT	NATURE OF THE IMPACT	IMPACT STATUS	MAGNITUDE	EXTENT	DURATION	REVERSIBILITY	IRREPLACEABILITY	PROBABILITY	SIGNIFICANCE	MITIGATION POTENTIAL	SIGNIFICANCE	CONFIDENCE RATING	CUMULATIVE IMPACTS
									PRE-MITIGATION		POST-MITIGATION		
	Fugitive dust emissions including Particulate Matter and Total Suspended Particulate emissions: Process fugitive emissions: Process fugitive particulate emissions as a result of sintering and handling operations within the pelletising plant building PM10 emissions are assumed to be 75% of total particulate emissions, which is a conservative assumption.	-	5	4	3	3	15	5	High	High	Low	Sure	Low
	Fugitive dust emissions: Materials handling Materials handling points associated with the pelletising plant include raw material delivery by truck and conveyor transfer points.	-	5	4	3	3	15	5	High	High	Low	Sure	Very Low
	Fugitive dust emissions: Vehicle entrainment of dust from paved roads. On entering the TFC site, trucks delivering raw materials for use at the pelletising plant travel on a section of paved road of approximately 400 m in length. These trucks have an average pay load of 28 tons and an average weight of 33 tons. Site specific particle size analysis determined the silt loading of the paved surface to be 307 g/m ² . The TFC entrance road is swept on a regular basis and a control efficiency of 75% were applied to emission calculations.	-	3	3	3	3	12	5	Medium	High	Low	Sure	Very Low
	Vehicle entrainment of dust from unpaved roads. Raw material is delivered to the West Plant bunkers via truck. These trucks with a pay load of 28 tons and an average weight of 33 tons move on a section of unpaved road that is approximately 230 m long and	-	3	3	3	3	12	5	Medium	High	Low	Sure	Low

ENVIRONMENTAL ASPECT	NATURE OF THE IMPACT	IMPACT STATUS	MAGNITUDE	EXTENT	DURATION	REVERSIBILITY	IRREPLACEABILITY	PROBABILITY	SIGNIFICANCE	MITIGATION POTENTIAL	SIGNIFICANCE	CONFIDENCE RATING	CUMULATIVE IMPACTS
									PRE-MITIGATION		POST-MITIGATION		
	passes in front of the West Plan bunkers. A 25% silt content of the material on the surface of the unpaved road section was determined through site specific particle size analysis.												
WASTE	Generation of general waste, litter and building rubble and hazardous material during the operational phase.	-	4	3	3	2	12	4	Medium	High	Very Low		
TRAFFIC	Traffic associated with the bulk delivery of LSR.	-	4	3	3	3	13	5	Medium	Low	Medium		
	Access Control	-	5	2	5	5	17	4	High	High	Low		
HEALTH AND SAFETY	Possibility of operational activities and workers causing veld fires, which can potentially cause injury and or loss of life to workers and surrounding landowners, visitors and workers.	-	5	2	5	5	17	4	High	High	Low	Sure	Low
	Increased risk to public health and safety: Dangerous areas and activities poses health risks and possible loss of life to construction workers and visitors to the site.	-	5	2	5	5	17	4	High	High	Low	Sure	Low
	Security risks: Trespassing of workers on adjacent properties and possible crime e.g. poaching.	-	5	4	1	3	13	4	Medium	High	Low	Sure	Low
SERVICES	Damage or destruction of existing infrastructure in the near vicinity of the proposed activities. Impacts on existing infrastructure, services and servitudes.	-	5	4	1	3	13	4	Medium	High	Low	Sure	Low
SOCIO-ECONOMIC	Negative – Socio-economic impact on farmers and surrounding land owners and users due to negative impacts on groundwater, dust pollution, noise pollution etc.	-	4	3	2	2	11	4	Medium	Medium	Low	Sure	Very Low
	Positive – Cost reduction as a result of LSR gas supplementing the use of high cost LPG.	+	5	5	3	3	16	5	High (+)	N/A	High (+)	Sure	Medium

Table 3: Impact Assessment of Impacts during the Decommissioning Phase

ENVIRONMENTAL ASPECT	NATURE OF THE IMPACT	IMPACT STATUS	MAGNITUDE	EXTENT	DURATION	REVERSIBILITY	IRREPLACEABILITY	PROBABILITY	SIGNIFICANCE	MITIGATION POTENTIAL	SIGNIFICANCE	CONFIDENCE RATING	CUMULATIVE IMPACTS
									PRE-MITIGATION		POST-MITIGATION		
GEOLOGY AND SOILS	<p>Contamination of soils through:</p> <ul style="list-style-type: none"> • Indiscriminate disposal of waste; and • Accidental spillage of chemicals such as hydrocarbon-based fuels and oils or lubricants spilled from construction vehicles and other chemicals from construction activities e.g. paints. 	-	5	2	1	3	11	4	Medium	High	Very Low	Sure	Very Low
HYDROLOGY GROUNDWATER SURFACE WATER	<p>Contamination of stormwater runoff and groundwater, caused by:</p> <ul style="list-style-type: none"> • Erosion; • Sediment release; • Chemicals such as hydrocarbon-based fuels and oils or lubricants spilled from construction vehicles; • Improper handling, storage and disposal of substances and hazardous chemicals; • Incorrect waste management; • Effluent discharges and seepage, due to a lack of stormwater management; • Pollutants from hazardous production waste and general waste generated on site. 	-	5	4	1	3	13	4	Medium	High	Low	Sure	Very Low
BIODIVERSITY	<p>Alien species may encroach onto the surrounding natural areas. Alien species generally out-compete indigenous species for water, light, space and nutrients as they are adaptable to changing conditions and are able to easily invade a wide range of ecological niches. Alien invader plant species pose</p>	-	4	3	2	2	11	3	Low	High	Very Low	Sure	Low

ENVIRONMENTAL ASPECT	NATURE OF THE IMPACT	IMPACT STATUS	MAGNITUDE	EXTENT	DURATION	REVERSIBILITY	IRREPLACEABILITY	PROBABILITY	SIGNIFICANCE	MITIGATION POTENTIAL	SIGNIFICANCE	CONFIDENCE RATING	CUMULATIVE IMPACTS
									PRE-MITIGATION		POST-MITIGATION		
	an ecological threat as they alter habitat structure, lower biodiversity (both number and "quality" of species), and change in nutrient cycling and productivity, and modify food webs. This negatively affects the ability of the disturbed area to maintain floral biodiversity, which will lead to the subsequent further degradation of the surrounding area.												
	Disturbance and loss of fauna through noise, light and air and water pollution and hunting, trapping and killing of fauna.	-	4	3	2	2	11	3	Low	Medium	Very Low	Sure	Very Low
ARCHAEOLOGICAL / HERITAGE RESOURCES	No cultural heritage resources occurs on site and it is highly unlikely that any objects will be uncovered or disturbed, as these objects generally occurs below ground level and no earthworks are planned as part of the construction / installation of the tank.	-	2	1	5	5	13	1	Very Low	Medium	Very Low	Sure	Very Low
VISUAL AND SENSE OF PLACE	No significant visual impact is expected to occur as a result from the decommissioning of the LSR tank.	-	2	1	5	5	13	1	Very Low	Low	Very Low	Sure	Very Low
NOISE AND VIBRATION	Nuisance and health risks caused by an increase in the ambient noise level as a result of noise impacts associated with the construction vehicles and equipment and activities.	-	4	3	2	2	11	3	Low	Medium	Very Low	Sure	Very Low
	Disturbance due to vibrations caused by construction vehicles.	-	4	3	2	2	11	3	Low	Medium	Very Low	Sure	Low
AIR QUALITY	Fugitive dust emissions: Vehicle entrainment of dust from paved roads. On entering the TFC site, trucks delivering raw materials for use at the pelletising plant travel on a section of paved road of approximately 400 m in	-	5	4	1	3	13	4	Medium	Medium	Low	Sure	Low

ENVIRONMENTAL ASPECT	NATURE OF THE IMPACT	IMPACT STATUS	MAGNITUDE	EXTENT	DURATION	REVERSIBILITY	IRREPLACEABILITY	PROBABILITY	SIGNIFICANCE	MITIGATION POTENTIAL	SIGNIFICANCE	CONFIDENCE RATING	CUMULATIVE IMPACTS
									PRE-MITIGATION		POST-MITIGATION		
	length. These trucks have an average pay load of 28 tons and an average weight of 33 tons. Site specific particle size analysis determined the silt loading of the paved surface to be 307 g/m ² . The TFC entrance road is swept on a regular basis and a control efficiency of 75% were applied to emission calculations.												
	Vehicle entrainment of dust from unpaved roads. Raw material is delivered to the West Plant bunkers via truck. These trucks with a pay load of 28 tons and an average weight of 33 tons move on a section of unpaved road that is approximately 230 m long and passes in front of the West Plan bunkers. A 25% silt content of the material on the surface of the unpaved road section was determined through site specific particle size analysis.	-	5	4	1	3	13	4	Medium	Medium	Low	Sure	Low
WASTE	Generation of general waste, litter and building rubble and hazardous material during the construction phase.	-	4	3	2	2	11	3	Low	Medium	Very Low	Sure	Very Low
TRAFFIC	The change in traffic patterns as a result of heavy vehicles and other traffic entering and exiting the site, on the surrounding road infrastructure and existing traffic.	-	2	1	5	5	13	1	Very Low	Medium	Very Low	Sure	Very Low
	Access Control	-	5	2	5	5	17	4	High	High	Low	Sure	Low
HEALTH AND SAFETY	Possibility of construction activities and workers causing veld fires, which can potentially cause injury and or loss of life to workers and surrounding landowners, visitors and workers.	-	5	2	5	5	17	4	High	High	Low	Sure	Low

ENVIRONMENTAL ASPECT	NATURE OF THE IMPACT	IMPACT STATUS	MAGNITUDE	EXTENT	DURATION	REVERSIBILITY	IRREPLACEABILITY	PROBABILITY	SIGNIFICANCE	MITIGATION POTENTIAL	SIGNIFICANCE	CONFIDENCE RATING	CUMULATIVE IMPACTS
									PRE-MITIGATION		POST-MITIGATION		
	Increased risk to public health and safety: Dangerous areas and activities poses health risks and possible loss of life to construction workers and visitors to the site.	-	5	2	5	5	17	4	High	High	Low	Sure	Low
	Security risks: Trespassing of workers on adjacent properties and possible crime e.g. poaching.	-	5	4	1	3	13	4	Medium	High	Low	Sure	Low
SERVICES	Damage or destruction of existing infrastructure in the near vicinity of the proposed activities. Impacts on existing infrastructure, services and servitudes.	-	5	4	1	3	13	4	Medium	High	Low	Sure	Low
SOCIO-ECONOMIC	Negative – Socio-economic impact on farmers and surrounding land owners and users due to negative impacts on groundwater, dust pollution, noise pollution etc.	-	4	3	2	2	11	3	Low	Medium	Very Low	Sure	Very Low