OPERATIONAL PHASE

Geographical and Physical

1. Irrigation quality

Irrigation by effluent	Geographical and Physical Aspect Impacts
OPERATIONAL PHASE	
Potential impact and risk:	**Irrigation quality**
Nature of impact:	**Contamination by irrigation with inadequately treated wastewater**
Extent and duration of impact:	**Extent 1 (Footprint) & Duration 1 (0-1 years)**
Consequence of impact or risk:	**Poor quality of irrigation water**
Magnitude:	**4 (low)**
Probability of occurrence:	**2 (Improbable: some possibility, but low likelihood)**
Degree to which the impact may cause irreplaceable loss of resources:	**2-Resource may be partly destroyed (PR)**
Degree to which the impact can be reversed:	**Completely reversible (R)**
Indirect impacts:	**None anticipated**
Cumulative impact prior to mitigation:	**None anticipated**
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**12 - low**
Degree to which the impact can be avoided:	**High**
Degree to which the impact can be managed:	**High**
Degree to which the impact can be mitigated:	**1-Completely mitigatable (CM)**
Proposed mitigation:	• **Treatment of wastewater must take place strictly according to wastewater quality standards as set by DWS, and treated wastewater must be monitored on a regular basis to verify water quality. The WWTW water use license have set treated water quality standards that is applicable to the release of treated effluent directly into a water course. The standards for releasing treated effluent directly into the water course is of better quality than that of irrigated water. The WWTW is designed and currently operate and treat the effluent to the licensed quality standard perimeters. The irrigation of the treated effluent will not have a negative impact on the natural environment if the water use authorization conditions are met and adhered to.** • **Sludge must be classified according to the South African Wastewater Sludge Classification criteria as set out in the DWS Guidelines of for the Utilisation and Disposal of Wastewater Sludge.**
Residual impacts:	**It is not anticipated that the impact will be high if the mitigation measures are adhered to.**
Cumulative impact post mitigation:	**It is not anticipated that the impact will be high if the mitigation measures are adhered to.**
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**low**
DECOMMISSIONING AND CLOSURE PHASE	
Potential impact and risk:	**SAME AS OPERATIONAL**

2. Ground water quality

Irrigation by effluent	Geographical and Physical Impacts
OPERATIONAL PHASE	
Potential impact and risk:	**Groundwater quality**
Nature of impact:	**Excessive discharge leading to pollution of ground water**
Extent and duration of impact:	**Extent 1 (footprint) & Duration 1 (0-1 years)**
Consequence of impact or risk:	**Ground water polluted**
Magnitude	**0 – Will have no effect on the environment**
Probability of occurrence:	**2 - Improbable: some possibility, but low likelihood**
Degree to which the impact may cause irreplaceable loss of resources:	**2 - Resource may be partly destroyed (PR)**
Degree to which the impact can be reversed:	**Completely reversible (R)**
Indirect impacts:	**None anticipated**
Cumulative impact prior to mitigation:	**None anticipated**
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**4 - Low**
Degree to which the impact can be avoided:	**High**
Degree to which the impact can be managed:	**High**
Degree to which the impact can be mitigated:	**1-Completely mitigatable (CM)**
Proposed mitigation:	• **A groundwater quality monitoring programme is in place to detect any contamination that may be linked irrigation of treated effluent or disposal of sludge and it is monitored in terms of the water use authorization guidelines.** • **Irrigation management**
Residual impacts:	**It is not anticipated that the impact will be high if the mitigation measures are adhered to.**
Cumulative impact post mitigation:	**It is not anticipated that the impact will be high if the mitigation measures are adhered to.**
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low**
DECOMMISSIONING AND CLOSURE PHASE	
Potential impact and risk:	**SAME AS OPERATIONAL**

POSITIVES

1. Surface Water

Using effluent for Irrigation - Preferred	**Geographical and Physical Impacts**
OPERATIONAL PHASE	
Potential impact and risk:	**Surface Water (positive)**
Nature of impact:	**Improved surface water quality**
Extent and duration of impact:	**Extent 1 (footprint) & Duration 5 (permanent)**
Consequence of impact or risk:	**No direct discharges of wastewater into the Kram River**
Magnitude:	**0 – Will have no effect on the environment**
Probability of occurrence:	**2 - Improbable: some possibility, but low likelihood**
Degree to which the impact may cause irreplaceable loss of resources:	**2 - Resource may be partly destroyed (PR)**
Degree to which the impact can be reversed:	**Completely reversible (R)**
Indirect impacts:	**None anticipated**
Cumulative impact prior to mitigation:	**None anticipated**
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**8 - Low**
Degree to which the impact can be avoided:	**High**
Degree to which the impact can be managed:	**High**
Degree to which the impact can be mitigated:	**1-Completely mitigatable (CM)**
Proposed mitigation:	• **Treatment of wastewater must take place strictly according to wastewater quality standards as set by DWS, and treated wastewater must be monitored on a regular basis to verify water quality. The WWTW water use license have set treated water quality standards that is applicable to the release of treated effluent directly into a water course. The standards for releasing treated effluent directly into the water course is of better quality than that of irrigated water. The WWTW is designed and currently operate and treat the effluent to the licensed quality standard perimeters. The irrigation of the treated effluent will not have a negative impact on the natural environment if the water use authorization conditions are met and adhered to.** • **Sludge must be classified according to the South African Wastewater Sludge Classification criteria as set out in the DWS Guidelines of for the Utilisation and Disposal of Wastewater Sludge.**
Residual impacts:	**It is not anticipated that the impact will be high if the mitigation measures are adhered to.**
Cumulative impact post mitigation:	**It is not anticipated that the impact will be high if the mitigation measures are adhered to.**
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low**
DECOMMISSIONING AND CLOSURE PHASE	
Potential impact and risk:	**SAME AS OPERATIONAL**

2. Soil quality

Irrigation by effluent	**Geographical and Physical Impacts**
OPERATIONAL PHASE	
Potential impact and risk:	**Soil quality**
Nature of impact:	**Use of stabilised sludge as a nutrient source and/or soil conditioner**
Extent and duration of impact:	**Extent 1 (footprint) & Duration 1 (0-1 years)**
Consequence of impact or risk:	**Supply of major plant nutrients and soil physical properties**
Magnitude	**0 – Will have no effect on the environment**
Probability of occurrence:	**1 – probably will not happen**
Degree to which the impact may cause irreplaceable loss of resources:	**1 – Resource will not be lost or destroyed provided that mitigation and Rehabiliation as stipulated in the EMP are implemented**
Degree to which the impact can be reversed:	**1 – The impact can be mostly to completely reversed with the implementation of the correct mitigation and rehabilitation measures.**
Indirect impacts:	**None anticipated**
Cumulative impact prior to mitigation:	**None anticipated**
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**3 - Low**
Degree to which the impact can be avoided:	**High**
Degree to which the impact can be managed:	**High**
Degree to which the impact can be mitigated:	**1-Completely mitigatable (CM)**
Proposed mitigation:	• **Treatment of wastewater must take place strictly according to wastewater quality standards as set by DWS, and treated wastewater must be monitored on a regular basis to verify water quality.** • **Sludge must be classified according to the South African Wastewater Sludge Classification criteria as set out in the DWS Guidelines of for the Utilisation and Disposal of Wastewater Sludge.**
Residual impacts:	**It is not anticipated that the impact will be high if the mitigation measures are adhered to.**
Cumulative impact post mitigation:	**It is not anticipated that the impact will be high if the mitigation measures are adhered to.**
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	**Low**
DECOMMISSIONING AND CLOSURE PHASE	
Potential impact and risk:	**SAME AS OPERATIONAL**