

IMPACT ASSESSMENT METHODOLOGY

1. TYPE OF IMPACTS

Potential environmental impacts may either have a positive or negative effect on the environment, and can in general be categorised as follows:

- a) **Direct/Primary Impacts:** Primary impacts are caused directly due to the activity and generally occur at the same time and at the place of the activity.
- b) **Indirect/Secondary Impacts:** Secondary impacts induce changes that may occur as a result of the activity. These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken.
- c) **Cumulative Impacts:** Cumulative impacts are those that result from the incremental impact of the proposed activity on common resources when added to the impacts of other past, present or reasonably foreseeable future activities. Cumulative impacts can occur from the collective impacts of individual minor actions over a period of time, and can include both direct and indirect impacts.

2. APPROACH AND METHOD

The impact assessment methodology is included here. It may also be important to consider the frequency of the impact in some projects e.g. a railway development where the impact is dependent on how often the train passes Oom Jan's house. The frequency rating would be calculated based on the same criteria levels as the table below (very infrequently (1) - very frequently (5)).

2.1 Risk/Impact Assessment Methodology

2.1.1 Impact Ranking Criteria

The significance of the impact is dependent on the consequence and the probability that the impact will occur.

$$\mathbf{impact\ significance = consequence \times probability}$$

Where:

$$\mathbf{consequence = (severity + extent)/2}$$

and

$$\mathbf{severity = [intensity + duration]/2}$$

Each criterion is given a score from 1 to 5 based on the definitions given in Table 2.1. Although the criteria used for the assessment of impacts attempts to quantify the significance, it is important to note that the assessment is generally a qualitative process and therefore the application of these criteria is open to interpretation. The process adopted has thus involved the application of scientific measurements and professional judgement to determine the significance of environmental impacts associated with the project.

Where the consequence of an event is not known or cannot be determined, the “precautionary principle” is adhered to and the worst-case scenario assumed. Where possible, mitigation measures to reduce the significance of negative impacts and enhance positive impacts will be implemented. The detailed actions, which are required to ensure that mitigation is successful, will be provided in the environmental management programme.

Consideration has also been given to the phase of the project during which the impact occurs. The phase of the development during which the impact will occur has also been noted to assist with the scheduling and implementation of management measures.

Table 2-1: Criteria for Assessing Significance of Impacts

INTENSITY = MAGNITUDE OF IMPACT	RATING
Insignificant: impact is of a very low magnitude	1
Low: impact is of low magnitude	2
Medium: impact is of medium magnitude	3
High: impact is of high magnitude	4
Very high: impact is of highest order possible	5
DURATION = HOW LONG THE IMPACT LASTS	RATING
Very short-term: impact lasts for a very short time (less than a month)	1
Short-term: impact lasts for a short time (months but less than a year)	2
Medium-term: impact lasts for more than a year but less than the life of operation.	3
Long-term: impact occurs over the operational life of the operation.	4
Residual: impact is permanent (remains after closure)	5
EXTENT = SPATIAL SCOPE OF IMPACT	RATING
Limited: impact affects the immediate site only	1

Small: impact affects immediate site and surrounds	2
Medium: impact affects the entire project area	3
Large: impact affects an area greater than the site (including neighbouring areas).	4
Very Large: impact affects an area larger than the site and neighbouring areas.	5
PROBABILITY = LIKELIHOOD THAT THE IMPACT WILL OCCUR	RATING
Highly unlikely: the impact is highly unlikely to occur	0.2
Unlikely: the impact is unlikely to occur	0.4
Possible: the impact could possibly occur	0.6
Probable: the impact will probably occur	0.8
Definite: the impact will occur	1

IMPACT SIGNIFICANCE

NEGATIVE IMPACTS

≤1	Very low	Impact is negligible. No mitigation required.
>1≤2	Low	Impact is of a low order. Mitigation could be considered to reduce impacts. But does not affect environmental acceptability.
>2≤3	Moderate	Impact is real but not substantial in relation to other impacts. Mitigation should be implemented to reduce impacts.
>3≤4	High	Impact is substantial. Mitigation is required to lower impacts to acceptable levels.
>4≤5	Very High	Impact is of the highest order possible. Mitigation is required to lower impacts to acceptable levels. Potential Fatal Flaw.

POSITIVE IMPACTS

≤1	Very low	Impact is negligible.
>1≤2	Low	Impact is of a low order.
>2≤3	Moderate	Impact is real but not substantial in relation to other impacts.
>3≤4	High	Impact is substantial.
>4≤5	Very High	Impact is of the highest order possible.

2.1.2 Cumulative Impacts

The cumulative impact assessment refers to the impact of the project in “addition” to current impacts that exist in the environment.

2.1.3 Mitigation

Mitigation measures for significant impacts have been identified as part of the impact assessment. The impacts have been ranked before and after the implementation of the mitigation measures. Consideration has also been given to the confidence level that can be placed on the successful implementation of the mitigation:

- **High Confidence:** mitigation measure easy and inexpensive to implement.
- **Medium Confidence:** mitigation measure expensive or difficult to implement.
- **Low Confidence:** mitigation measure expensive and difficult to implement.