

SWIM and Horizon 2020 Support Mechanism

Working for a Sustainable Mediterranean, Caring for our Future

Environmental assessment of leachate treatment projects

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Outline of the presentation

- **What is the Environmental Assessment**
- **Identification of the problem**
- **Evaluation of alternative solutions**
- **Identification and evaluation of alternative design concepts in the selection of a preferred design concept**
- **Preparation and submission of a Project File for public and government agency review**
- **Implementation of the preferred alternative and monitoring of any impacts**

What is the Environmental Assessment

- **Environmental assessment (EA) is the assessment of the environmental consequences (positive and negative) of a plan, policy, program, or actual projects prior to the decision to move forward with the proposed action**
- **The purpose of the assessment is to ensure that decision makers consider the environmental impacts when deciding whether or not to proceed with a project.**
- **EAs are unique in that they do not require adherence to a predetermined environmental outcome, but rather they require decision makers to account for environmental values in their decisions and to justify those decisions in light of detailed environmental studies and public comments on the potential environmental impacts**

Description of the project

- **Description of actual project and site description**
- **Break the project down into its key components, i.e. construction, operations, decommissioning**
- **For each component list all of the sources of environmental disturbance**
- **For each component all the inputs and outputs must be listed, e.g., air pollution, noise, hydrology**

Baseline scenario (1/2)

- **Typically the starting point of the assessment Process**
- **The Baseline is a description of the current status of the environment in and around the area in which the Project will be located.**
- **Specifically, developing a robust Baseline scenario for the EIA serves two key purposes:**
 - it provides a description of the status and trends of environmental factors against which significant effects can be compared and evaluated
 - it forms the basis on which ex-post monitoring can be used to measure change once the Project has been initiated

Baseline scenario (2/2)

- **The Baseline assessment needs to be detailed and comprehensive enough to allow for an understanding of the extent of environmental impacts, but must be conducted within a reasonable time and with a reasonable amount of effort on the part of the Developer.**
- **The collection of relevant data is critical to a robust assessment of the Baseline. Data should be identified and assessed by qualified experts**
- **Efficiencies in data collection from existing databases, free services, and other relevant environmental assessments should always be investigated.**

Assessment of the Alternatives (1/2)

- Examine alternatives that have been considered
- The alternatives should be built upon the findings of a preliminary engineering assessment completed at the start of the EA process
- Example:

Alternative 1: No action

Alternative 2: On Site Treatment and Infiltration

Alternative 3: On Site Treatment and Discharge

Alternative 4: Pump Leachate via forcemain to the existing sanitary collection system

Assessment of the Alternatives (2/2)

The Developer needs to provide:

- A description of the reasonable Alternatives studied
- An indication of the main reasons for selecting the chosen option with regards to their environmental impacts.

Some examples of the types of Alternatives to be considered, include:

- the nature of Project;
- timeframes for construction or the lifespan of the Project;
- process by which the Project is constructed;
- equipment used either in the construction or running of the Project;
- site layout (e.g. location of buildings, waste disposal, access roads);
- operating conditions (e.g. working schedule, timing of emissions);
- physical appearance and design of buildings, including the materials to be used;
- means of access, including principal mode of transport to be used to gain access to the Project.

Description of the environmental factors

- List of all aspects of the environment that may be affected by the development
- This section is best carried out with the help of local experts

Environmental components that might be examined within the alternative solutions context:

- Aquatic environment (biodiversity)
- Terrestrial environment
- Social environment
- Cultural (Heritage)
- Economic environment (municipality)
- Technical (transportation)

Description of the significant effects on the environment

- The word significant is crucial here as the definition can vary
- The level of effect is often characterized as Low, Moderate, High
- The matrix is a tool used in the systematic examination of potential interactions

Impact considerations on the environmental factors (1/3)

Environmental Component	Option	Level of effect	Impact Considerations
Aquatic	1) Do Nothing	Low	Few impacts to aquatic habitat are anticipated as the trucking option does not require construction. However there is an increased risk related to potential spills given the number of trucks being used per year.
	2) On Site Treatment and Infiltration	Moderate	Some impacts to aquatic habitat may occur related to subsurface migration of leachate as the strength and volume of leachate increase over time.
	3) On Site Treatment and Discharge	High	Impacts to aquatic habitat are anticipated as a result of construction-related activities during construction of the outfall. Long term impacts to water quality may also occur as the strength and volume of leachate increase over time.
	4) Pump Leachate	Low to Moderate	<ul style="list-style-type: none"> Some impacts to aquatic habitat are anticipated as a result of construction-related activities. All route alternatives require stream crossings, however directional drilling technology will minimize impacts. Potential impacts may also occur at the Wastewater Treatment Plant (WWTP) when leachate is added to the current sewage stream entering the plant. A review of treatment technologies will occur during final design to ensure that the current treatment standards are maintained.
Terrestrial	1) Do Nothing	Low	No impacts to terrestrial habitat are anticipated.
	2) On Site Treatment and Infiltration	Low to moderate	Some impacts to terrestrial habitat may result from construction of the on-site treatment facility and disposal bed.
	3) On Site Treatment and Discharge	Moderate to high	Moderate impacts to terrestrial habitat are anticipated during construction of the outfall pipe.
	4) Pump Leachate	Low to moderate	<ul style="list-style-type: none"> Some impacts to terrestrial habitat are anticipated as a result of construction-related activities. Some route alternatives require construction adjacent to forested areas, and wetlands, although final route selection activities will involve detailed habitat assessments to address these impacts.

Impact considerations on the environmental factors (2/3)

Environmental Component	Option	Level of effect	Impact Considerations
Heritage	1) Do Nothing	Low	No impacts to cultural heritage features are anticipated.
	2) On Site Treatment and Infiltration	Low	Few impacts to cultural heritage features are anticipated, assuming that construction of the treatment facility and disposal bed can occur within the limits of the existing landfill site.
	3) On Site Treatment and Discharge	Low to moderate	Some impacts to cultural heritage features may occur during construction of the outfall pipe. A stage 2 Archaeological assessment would need to be completed along the anticipated route.
	4) Pump Leachate	Moderate	Some impacts to cultural heritage features may occur during construction. A stage 2 Archaeological assessment would need to be completed along the anticipated route once a preferred route is selected.
Community	1) Do Nothing	Moderate	Increased truck traffic resulting from the leachate transportation results in increased noise and traffic on roads surround the landfill.
	2) On Site Treatment and Infiltration	Moderate to high	<ul style="list-style-type: none"> • Site of the proposed infiltration facilities could result in negative impacts to adjacent properties if land acquisition is required to obtain a sufficient land base for disposal. • Subsurface disposal may also increase offsite leachate impacts to adjacent properties. • Operation of the facilities should not negatively impact the community as the facilities will be situated within or adjacent to the existing landfill operations.
	3) On Site Treatment and Discharge	Moderate	<ul style="list-style-type: none"> • Few impacts are anticipated during construction and implementation of this option, however long term impacts to downstream properties could increase over time as the strength of the leachate increases. • Public perception of this alternative is anticipated to be negative.
	4) Pump Leachate	Low to moderate	<ul style="list-style-type: none"> • Some construction related impacts are anticipated during construction from noise, dust and temporary road restrictions during installation. • Few impacts are anticipated during operation of the facilities.

Impact considerations on the environmental factors (3/3)

Environmental Component	Option	Level of effect	Impact Considerations
Municipal	1) Do Nothing	High	Most expensive alternative
	2) On Site Treatment and Infiltration	Moderate	<ul style="list-style-type: none"> Moderately expensive option to implement and to operate over the long term. Potential for increased treatment costs over time as leachate volumes and strength increases over time.
	3) On Site Treatment and Discharge	Moderate	<ul style="list-style-type: none"> Moderately expensive option to implement and to operate over the long term. Potential for increased treatment costs over time as leachate volumes and strength increases over time.
	4) Pump Leachate	Low to moderate	<ul style="list-style-type: none"> Least expensive alternative. Different routing options vary in construction related costs depending on the length of the individual routes, the number of crossings, and the number of cleanouts required. Opportunities to partner with adjacent agricultural industries make this option more favorable to the local community. Operational costs are anticipated to the lowest over the long term.
Transportation	1) Do Nothing	High	Impacts to existing road infrastructure are high due to the number of trucks required to transport the leachate, based upon current volumes.
	2) On Site Treatment and Infiltration	Low	Few impacts to the existing transportation network are anticipated from implementation of this option.
	3) On Site Treatment and Discharge	Low	Few impacts to the existing transportation network are anticipated from implementation of this option.
	4) Pump Leachate	Low to moderate	<ul style="list-style-type: none"> Minor impacts to the existing road infrastructure are anticipated during construction Consultation with the local authorities will be undertaken during the detailed design phase in order to select the preferred location within the road allowance. No impacts are anticipated during operation of the facilities.

Mitigation (1/2)

- **Measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment**
- **From the previous analysis it is obvious where impacts are greatest**
- **Using this information ways to avoid negative impacts should be developed**
- **Best working with the developer with this section as they know the project best**

Mitigation (2/2)

Types of mitigation measures:

Measures to prevent

- Impact avoidance by:
 - Changing means or techniques, not undertaking certain Projects or components that could result in adverse impacts.
 - Changing the site, avoiding areas that are environmentally sensitive.
 - Putting in place preventative measures to stop adverse effects from occurring.

Measures to reduce

- Impact minimisation by:
 - Scaling down or relocating the Project.
 - Redesign elements of the Project.
 - Using a different technology.
 - Taking supplementary measures to reduce the impacts either at the source or at the receptor (such as noise barriers, waste gas treatment, type of road surface).

Measures to offset

- Offset or compensate for residual adverse impacts that cannot be avoided or further reduced in one area with improvements elsewhere with:
 - Site remediation / rehabilitation / restoration.
 - Resettlement.
 - Monetary compensation.

Monitoring (1/2)

- This section covers the legislative requirements to ensure that adequate Monitoring Measures are in place, both during the construction and operational phases of the Project.
- Monitoring Measures may be developed directly for the Project in question, or may arise from other requirements – EU or national legislation governing the operation of a Project, funding requirements or other sources
- Generally, Monitoring Measures can help to ensure that Projects meet all existing environmental legal requirements, and that impacts are in line with EA Report Projections. They should also ensure that any Mitigation or Compensation Measures for expected significant effects are carried out as planned.
- Monitoring Measures should be specific and detailed enough to ensure their implementation, including defining roles, responsibilities, and resources. In some cases, economies of scale can be achieved through the joint monitoring of related Projects. Measures should also be capable of identifying important unforeseen effects

Monitoring (2/2)

The monitoring requirements can help ensure:

- Significant adverse impacts from the construction and operation of Projects do not exceed impacts Projected in the EIA Report and that measures taken to offset such impacts are carried out as planned
- The methods with which significant adverse effects can be assessed for robustness. This can help to improve the identification of impacts in future EA Reports
- The EA is in line with other legislation

Non-technical summary (1/2)

- **The EA is in the public domain and be used in the decision making process**
- **It is important that the information is available to the public**
- **This section is a summary that does not include jargon or complicated diagrams**
- **It should be understood by the informed lay-person**

Non-technical summary (2/2)

The qualities of a good Non-Technical Summary

- The Non-Technical Summary is easily identifiable and is accessible within the EA Report
- The Non-Technical Summary provides a concise, but comprehensive description of the Project, its environment, the effects of the Project on the environment, the proposed Mitigation Measures, and the proposed monitoring arrangements
- The Non-Technical Summary highlights any significant uncertainties about the Project and its environmental effects
- The Non-Technical Summary explains the Development Consent process for the Project and the role of the EA in that process
- The Non-Technical Summary provides an overview of the approach to the assessment;
- The Non-Technical Summary is written in non-technical language, avoiding technical terms, detailed data and scientific discussion;
- The Non-Technical Summary is comprehensible to a lay member of the public.

Lack of know-how/technical difficulties

- This section is to advise any areas of weakness in knowledge
- It can be used to focus areas of future research
- Some developers see the EA as a starting block for poor environmental management

The qualities of a good EA Report (1/2)

- A clear structure with a logical sequence that describes, for example, existing Baseline conditions, predicted impacts (nature, extent and magnitude), scope for mitigation, proposed Mitigation/Compensation Measures, significance of unavoidable/residual impacts for each environmental factor
- A table of contents at the beginning of the document
- A description of the Development Consent procedure and how EIA fits within it
- Reads as a single document with appropriate cross-referencing
- Is concise, comprehensive and objective
- Is written in an impartial manner without bias
- Includes a full description and comparison of the Alternatives studied
- Makes effective use of diagrams, illustrations, photographs and other graphics to support the text
- Uses consistent terminology with a glossary

The qualities of a good EA Report (2/2)

- **References all information sources used**
- **Has a clear explanation of complex issues**
- **Contains a good description of the methods used for the studies of each environmental factor**
- **Covers each environmental factor in a way which is proportionate to its importance**
- **Provides evidence of effective consultations (if some consultations have already taken place)**
- **Provides basis for effective consultations to come**
- **Makes a commitment to mitigation (with a programme) and to monitoring**
- **Contains a Non-Technical Summary which does not contain technical jargon**
- **Contains, where relevant, a reference list detailing the sources used for the description and assessments included in the report**

Quality of experts

The effectiveness of the EA procedure relies upon high-quality EA Reports that can be properly reviewed and evaluated by competent experts and which can contribute to sound decision-making.

In order for this to be possible, the competent experts must be involved in both the preparation and in the review of the EA Report

- The Developer needs to ensure the quality of the experts who prepare the EA Report
- The Competent Authority needs to ensure that it has access to the necessary expertise to review and to evaluate the EA Report
- The Competent Authority must be able to request more information, where relevant, from the Developer.

Consultation program (1/2)

- **The EIA Report is an informative decision-making tool. Once it has been prepared by the Developer, it has to be examined by the public and various concerned authorities.**
- **Consultations include two main elements:**
 - informing the consultees; and
 - giving consultees, whether the public or public authorities, time to prepare and participate effectively in the environmental decision-making.

Consultation program (2/2)

Groups to be consulted:

- **Public Authorities likely to be concerned**
- **The public concerned**
- **Relevant Parties in affected other Member States**

Decision Making

- **Decision-making ensures that a clear justification of the reasons and the conditions associated with the decision to grant (or refuse) development consent are provided and that environmental conditions stemming from the EA decision are not sidelined when making the development consent decision.**
- **The aim is to ensure that the EA process has informed the decision-making process, and that a high level of environmental protection can be guaranteed once the Project is implemented and operating.**

Reasoned Conclusion

Tips for developing the Reasoned Conclusion:

- Examine and justify the different tools and methods used during the preparation of the EA Report, and subsequent consultations.
- Examine the information and data provided in the EA Report and during consultations. Key messages of the Baseline conditions, significant effects, predicted impacts of the Project, suggested Monitoring and Mitigating Measures, and other relevant information should be highlighted.
- Clearly discuss the evidence with a view to reaching a conclusion, allowing for any additional arguments which may arise.
- State clearly what the Reasoned Conclusion is and the arguments on which it relies.
- Define a program to mitigate and monitor the effects of the Project (in case significant adverse effects would be caused).