



Non-Technical Summary (English) in Relation to the Environmental Impact Assessment (EIA) for a Thermal Treatment Facility (TTF)

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Report



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1 DESCRIPTION OF THE PROPOSED DEVELOPMENT

This Non-Technical Summary outlines the findings of the Environmental Impact Assessment (EIA) that has been undertaken for EA/00020/22. The project, herein referred to as the “Scheme” involves the construction of a new Thermal Treatment Facility at the ECOHIVE complex, henceforth referred to as the TTF project (Figure 1).



FIGURE 1: PROPOSED SCHEME SITE FOOTPRINT AND IMMEDIATE SURROUNDINGS

1.1 PROJECT CHARACTERISTICS

The Scheme site lies within the outskirts of the Maghtab suburb, eastwards of the Zwejra landfill. The Scheme Site falls within the Maghtab Environmental Complex (also known as ECOHIVE Complex), managed by Wasteserv. The area is dominated by various waste management facilities including recycling plants, the Żwejra and Ghallis engineered landfills, along with other commercial, industrial and residential areas in the surroundings.

The footprint of the entire site earmarked for development is around 18,185m². The proposed facility features several ancillary buildings including a water treatment facility, offices, restrooms, laundry services, kitchen, various administrative spaces, access control points, a reception area for pet carcasses, and a substation. The development will also include parking areas and landscaped zones designed to blend seamlessly with the surrounding environment.

The existing Marsa TTF faces several operational limitations. The plant was constructed in 2007, with the intention of catering exclusively to animal wastes. The site also contains a very limited cold storage capacity, and limited space for expansion of such.

Economic analyses concluded that upgrade of the existing facility is not economically viable in comparison with investing in new technology at a more suitable location. Additionally, the nearby land uses at the existing site, which constitute several industrial, office and residential users, frequently submit complaints with regards to odour generation at the site.

Therefore, the relocation to the Maghtab ECOHIVE complex presents the most effective solution, both in terms of eliminating direct impacts on residents, and also increasing the efficiency of the waste management system as a whole, due to shorter transfers of materials between sites due to the proposed site being within the ECOHIVE complex.

The new TTF would form part of the broader ECOHIVE complex, which aims to centralise Malta's waste treatment facilities. This complex includes various operational arms operated by Wasteserv Malta which are all designed to enhance waste management capabilities and reduce reliance on landfills. The centralised location will also limit impacts related to the transport of waste from various sites, streamline logistics and reduce operational costs.

The existing TTF in Marsa processes approximately 5,000 to 6,000 tonnes of hazardous waste annually. Weekly transport trips reach figures of 130-150 vehicles. The annual throughput of waste to be processed at thermal treatment facilities is projected to rise above 10,000 tonnes per year by 2045. The waste streams to be processed include: carcasses, waste oils, chemicals, medical waste, cytotoxic waste, abattoir/butcher and meat processing wastes and other forms of liquid and solid wastes.

Sorting and processing of such waste streams will take place at receipt in the primary unloading area. Liquid wastes may be discharged into a tank farm for temporary storage in a second unloading area. The third unloading area shall be utilised for animal carcasses. Such organic waste will be shredded swiftly.

If supply is too high, temporary cold storage areas shall be utilised to allow sufficient time for shredding. Waste will be moved directly into enclosed areas equipped with ventilation and odour control systems. All buildings that handle residual or biodegradable waste must operate under negative pressure to prevent odour emissions from escaping. The facility will be designed to limit the release of airborne microorganisms. Mechanical ventilation will be used in areas where poor air quality may occur due to odours, dust, or bioaerosols, such as waste reception, preparation, and storage areas. These emissions will be treated to remove harmful particles and smells, protecting workers and preventing nuisance beyond the site boundary.

The proposed TTF would incorporate two separate lines, each equipped with rotary kilns and capable of processing a maximum of 1.2 tonnes of waste per hour, with an average minimum waste treatment capacity per line of 28.8 tons per line per day, under nominal conditions.

Thus the proposed new development will permit the processing of a maximum of 7,000 tons per year in each line. Initially, the development will run with two lines, with the possibility of expanding operations to three lines to meet future demand.

Construction works shall be divided into three distinct phases:

- Phase 1: Tendering and detail design
- Phase 2: Construction
- Phase 3: Testing and commissioning

The TTF shall be designed to operate for a lifetime of 20 years. Significant technological upgrades would be necessary to extend the lifetime of the facility further.

1.2 WASTE MANAGEMENT

The total quantity of excavated waste is expected to be approximately equal to 8,640m³. This material shall be crushed, sorted by site and cleared of any residual materials. The inert material shall be reused within the site boundary for backfilling purposes.

Fly ash and slag (bottom ash) are expected to be generated from the incineration processes. Fly ash will be stored in big bags and exported as hazardous waste. Slag may be reused for other projects.

2 ASSESSMENT OF ALTERNATIVES

2.1 DO-NOTHING SCENARIO

The current operations at the existing Marsa TTF are costly, pose adverse environmental and health impacts and has reached its operational capacity. Malta's LONG-TERM WASTE MANAGEMENT PLAN 2021-2030 also clearly states that the existing MTF should be relocated.

2.2 LOCATION

The creation of a new Thermal Treatment Facility (TTF) at ECOHIVE complex, or the upgrade of the existing one in Marsa, is clearly outlined in the Long-Term Waste Management Plan (2021–2030).

Four alternative sites were shortlisted within the ECOHIVE complex. All sites were assessed against various environmental, operational and policy criteria. The chosen site offered the most significant advantages when compared to the other sites assessed.

2.3 DOWNSCALING

Designing the new TTF was challenged by a limited and non-ideal site size. The plant was optimized to fit within these spatial limits while meeting operational needs. Further downsizing isn't possible without harming the proposed TTF performance.

2.4 LAYOUTS AND CONFIGURATIONS

TTF layouts can be linear, centralized, or modular. Amendments were made to allow for the split of the building into smaller area which can be developed at varying elevations and interconnected with bridges. The designers preferred this option to minimise excavation waste and to better integrate the design of the building into the existing slope.

3 LAND COVER AND LAND/SEA USES

The site consists of agricultural land with sparse trees and remnants of native vegetation. It features shallow terraced fields separated by rubble walls, some of which are deteriorating. These walls are protected under local regulations. The terraces gradually slope toward the coastal area of Qalet Marku.

To the northwest and west are the engineered Għallis and ta' Żwejra landfill sites, while the Anaerobic Digestion Plant is situated 100 meters to the north. To the east, the land is divided into small agricultural plots bordered by rubble walls. An access road runs along the southern and western edges of the site, with a dirt track providing direct access.

The proposed development will permanently transform the land from agricultural and natural use to industrial use, affecting indigenous tree plantations, rubble walls, and farmland. This shift is considered major adverse, though some impact on the tree plantation will be mitigated by incorporating a landscaped area that retains some original trees.

Temporary changes will occur during construction, including material storage and vehicle access, but these effects are expected to be minor and reversible with proper mitigation measures. Construction activities, particularly excavation and backfilling, may generate dust that could temporarily affect nearby farmland, trees, and roads, potentially reducing crop yields. However, mitigation measures such as site hoarding can minimize this impact, making it minor and temporary.

During the operational phase, rare incidents such as fuel spills or fires could further impact land use. While these risks are low, they could have serious consequences. Through an effective Emergency Response Plan as the final resort, their impact can be minimized to a minor level.

4 LANDSCAPE AND VISUAL ASSESSMENT

Construction activities will be visible from all seven assessed viewpoints. The presence of large cranes, excavation equipment, fencing, and material stockpiles will negatively affect the visual landscape, with the degree of impact ranging from moderate to major adverse, depending on the viewpoint and existing obstructions.

Viewpoints closer to the site, particularly VP3 and VP4 (refer to technical study for further detail), will experience the most significant visual disruption due to clear, short-range views of construction work. VP5 and VP7 will also face considerable impact, as their vantage points allow for an unobstructed view of tall machinery against the skyline, affecting a large number of observers. In contrast, Viewpoints 1, 2, and 6 will experience a lesser impact due to natural terrain and partial screening by walls, trees, or buildings. However, even at these locations, the impact remains moderately adverse.

Four viewpoints (VP1, VP2, VP6, and VP7) are located in areas of high landscape sensitivity, as defined by the CENTRAL MALTA LOCAL PLAN. The simultaneous construction of other waste management facilities will further degrade the landscape, particularly as agricultural land near the landfill is affected, leading to a significantly adverse impact on these viewpoints.

The TTF building itself is not situated in an area of high landscape sensitivity, but its construction will contribute to the visual intrusion affecting nearby waste management facilities. These combined effects will result in a notable decline in the overall landscape character.

Although the building occupies a prominent position and covers a large area, it is still smaller than the neighbouring ECOHIVE waste management facilities. Its visual impact varies from minor to major adverse, depending on the viewpoint. The impact is considered minor at Viewpoints 1 and 2, which are further away. To reduce visual massing, mitigation measures include partial excavation of the site, layering and sectioning of the buildings, soft landscaping, and recessing large tanks into the ground.

5 GEOLOGY, GEOMORPHOLOGY, HYDROGEOLOGY AND SOILS

The study area consists of a broad, low-lying agricultural spur at the base of a large landfill hill, rising from around 40 meters above sea level to approximately 100 meters. This gently sloping hillside extends toward the Baħar iċ-Ċagħaq and Għallis coastline and features distinct geomorphological elements.

The region's geology primarily consists of Lower Globigerina Limestone and Lower Coralline Limestone. The Lower Globigerina Limestone typically supports a soil layer, making it suitable for terraced agriculture, whereas the Lower Coralline Limestone forms a barren, rocky landscape with little to no soil cover. The landfill, covering roughly 500,000 square meters, has already altered the area's geomorphology, and additional excavation is expected to worsen its degradation.

A significant fault runs through the landfill, with smaller faults visible along the Coast Road. Here, a thin layer of Lower Globigerina Limestone is exposed within a shallow graben, bordered by normal faults with minimal displacement. The site itself is made up of terraced fields underlain by Lower Globigerina Limestone, resulting in a distinct soil type known as the L-Inglin man-made complex.

Excavation activities pose moderate to major adverse impacts, particularly the emission of dust, which could impact the coastline, coastal waters, and the I-Għadira S-Safra site, especially on dry, windy days. Additionally, loose stone material may spill during transport, requiring precautionary measures such as avoiding overfilled loaders and using protective covers to limit dust emissions. The excavation process could also lead to stability issues (moderate adverse impacts) due to intersecting rock joints, potentially creating unstable wedges. Addressing these risks will require ongoing monitoring and timely intervention.

To mitigate environmental impacts, construction activities must adhere to strict environmental regulations and best practices. Essential measures include sediment and erosion control, the use of silt fences, stormwater management, and maintaining well-organized construction sites to prevent pollution. Continuous monitoring and proactive stabilization efforts will be necessary to minimize rock face instability. These strategies are crucial for protecting the fragile coastal and agricultural ecosystems in the area.

6 WATER BODIES

The hydrological features surrounding the proposed site include the Wied Ta' Kieli catchment, the downstream watershed, nearby coastal waters, the mean sea level aquifer, private and public water boreholes, and adjacent wetlands. Potential environmental impacts from the construction and operation of the site include contamination of the aquifer (minor adverse), degradation of coastal waters (moderate adverse), and disruption of natural runoff patterns (moderate adverse).

During construction, activities such as demolition, rock excavation, and new building development may release dust and fine particles into the environment. The storage of excavated materials, especially during windy or rainy conditions, could further contribute to dust dispersion. To prevent contamination, hazardous substances should not be handled on-site. The operation of heavy machinery and vehicles may also generate dust, which can affect runoff quality and impact coastal waters. Additionally, paving the site will reduce permeability (moderate adverse), increasing surface runoff while limiting groundwater recharge (moderate adverse). The use of pesticides and fertilizers for landscaping could further contaminate the aquifer, which is already affected by nitrate pollution (moderate adverse).

Several measures can help mitigate these impacts, including dust suppression techniques such as silt fences, capturing fine particulates from stone processing, covering stored materials, and controlled water spraying of active areas. During operation, inspections of potential effluent discharge will help prevent accidental contamination of coastal waters. The development is expected to generate high runoff and minimal aquifer recharge, potentially worsening saltwater intrusion and affecting nearby water bodies. However, the site represents only a small portion of the overall recharge area of the Maltese Islands. Collecting and utilizing uncontaminated runoff for irrigation could indirectly support aquifer recharge, mitigating some of the impermeability effects.

Strict adherence to environmental regulations and best practices is essential to minimize the impact of construction activities. Effective sediment and erosion control, stormwater management, and proper site maintenance will help prevent pollution. Routine inspections of sewer systems and drainage outlets will ensure there are no leaks. Managing waste within a sealed system with an impermeable floor will prevent contamination of the surrounding rock and soil. Regular monitoring of effluents and groundwater quality, along with baseline water analysis, will provide a reference for assessing future environmental impacts.

7 ECOLOGY

The project involves clearing all trees and vegetation within the site, affecting approximately 50 protected trees, a major adverse impact. Some mature trees may be relocated to the site's perimeter, where a landscaped area of about 7,240 square meters will be created. However, whether trees are transplanted or removed will depend on soil depth, which will be assessed during excavation. If the soil is too shallow to safely extract the roots, the trees will be removed, as their chances of survival would be low.

The conversion of agricultural land, soil removal, and dismantling of rubble walls will cause irreversible damage to the ecological characteristics of the Area of Interest (AoI). This is a major adverse impact for flora and fauna that rely on agricultural soil and rubble walls, including soil-dwelling organisms and stationary species.

To compensate for tree loss, replanting will follow guidelines set by the Environment and Resources Authority (ERA), with native species typical of local maquis habitats introduced within the site or nearby. Excavation activities may generate dust and noise, but these effects can be managed using perimeter barriers, wheel-washing stations, and dust suppression techniques such as wetting exposed materials.

Construction work may also disrupt bird populations (moderate adverse impact). If activities take place between March and August, breeding territories of the Sardinian Warbler and the Zitting Cisticola could be disturbed or lost. Additionally, if work occurs between March and July, up to two breeding pairs of the Blue Rock Thrush could be affected. This disruption could lead to temporary displacement, reduced breeding success, and the loss of nest sites, potentially causing reproductive failure for all three species.

Artificial light at night (ALAN) poses major adverse impacts to birdlife, including seabirds. While the development is not directly visible from any seabird nesting sites, a significant colony of *P. yelkouan* seabirds on St. Paul's Island, located within 5 kilometers of the site, could be impacted. Increased sky glow from night-time construction, particularly between February and July, may negatively affect 45–70 breeding pairs in this colony. ALAN can also disturb nocturnally migrating birds.

To minimize environmental impact, it is recommended that the construction footprint remains as small as possible and that no work takes place at night. These measures should help protect nearby seabird populations from significant disruption.

8 AGRICULTURE

The expansion of waste management facilities in Maghtab poses a major adverse environmental impact on sustainable rural land use. Converting agricultural and natural areas into built infrastructure reduces available green spaces and disrupts local ecosystems. This transformation not only diminishes ecological habitats but also contributes to issues such as rising local temperatures, increased runoff and flood risk, higher pollution levels, and a decline in fodder production.

An agricultural assessment of the TTF site and its surroundings indicates that the land has significant farming limitations due to its shallow rooting zone, high stone content, very low moisture retention, and poor soil fertility. These conditions severely restrict agricultural productivity and may lead to land abandonment. Additionally, the site's proximity to the sea makes it susceptible to sea spray, while dust from a nearby waste management complex further exacerbates the challenges. With no access to a water supply, the land is only viable for hay cultivation, and its poor soil quality combined with irregular rainfall further limits crop production potential.

While the proposed development will result in the loss of agricultural land, the residual impact is minimal due to the small area affected and the land's already low agricultural value.

9 ARCHAEOLOGY & CULTURAL HERITAGE

The area of interest consists of agricultural land that has been gradually transformed into terraced fields, incorporating structures such as dry-stone walls and huts. Nearby megalithic remains indicate that the area has been inhabited since prehistoric times, with some ancient stones repurposed for rural construction. However, historical records regarding past land use in the area are scarce.

The primary heritage feature within the site is the Taż-Żebbuġija Megaliths, located approximately 100 meters from the proposed development. While these remains will not be directly affected by the construction, the site has been identified as a potential archaeological zone.

Archaeological evaluations have already documented and excavated any stratified deposits above bedrock along with related cultural materials, ensuring preservation by record. Consequently, no further archaeological investigations are required within the area of interest, except for the southwest and southern boundaries, which still contain undisturbed soil that may conceal cultural remains.

Several dry-stone huts within the area are likely to suffer damage from the development, causing major adverse impacts. These huts, once widespread across Malta but now primarily found in the island's northern regions, historically provided shelter for farmers and livestock. They are legally protected due to their architectural, cultural, and ethnographic significance. Regulations prohibit the alteration or demolition of rubble walls and rural structures to maintain their historical integrity.

The study concludes that the proposed development will have a direct and negative impact on cultural features within the area, though it will have minimal or no direct effect on known heritage sites at its perimeter.

Given the possibility of undiscovered cultural remains beneath vegetation and soil, it is recommended that an archaeological monitor be present during any excavation or ground-disturbing activities. This will help ensure the protection of any cultural artifacts that may be uncovered. Additionally, maintaining a buffer zone of at least 50 meters around identified cultural heritage sites is advised to safeguard their preservation.

10 AIR QUALITY

Following a six-week baseline air quality monitoring exercise, a total of 55 air quality receptors were identified and assessed within a radius of the TTF's proposed chimney stack. Three air quality models were tested to simulate different operational scenarios, including a worst-case scenario. The assessment factored in the use of appropriate Flue Gas Treatment (FGT) and Continuous Emission Monitoring Systems (CEMS) to regulate and monitor emissions.

The findings indicate that NO_2 , PM_{10} , and $\text{PM}_{2.5}$ concentrations would remain within regulatory air quality limits under all scenarios and thus cause negligible adverse impacts. Additionally, mass deposition rates for various pollutants were found to be within the acceptable thresholds set for different chemical groups. A comparison with the limits established in Directive 2008/50/EC on Ambient Air Quality and Cleaner Air for Europe confirmed that the predicted emissions would remain below the regulatory standards.

The study also evaluated the combined impact of emissions from both the TTF and Waste-to-Energy (WtE) chimney stacks. The results suggest that cumulative effects are generally not expected to be significant. However, a minor adverse impact on PM_{10} levels may occur at receptor R27, a sensitive location situated on agricultural land in Maghtab, approximately 0.43 km from the TTF.

11 NOISE & VIBRATIONS

The noise assessment was conducted in accordance with relevant standards and guidelines. For construction activities, the study determined that daytime noise levels at the closest receptors are expected to remain within permissible limits. As construction noise is temporary and modelled for worst-case scenarios, the impact is classified as minor adverse.

To further reduce potential noise impacts, best-practice mitigation measures should be implemented where applicable. Noise emissions should be considered when selecting on-site machinery and equipment, which must be well-maintained and fitted with appropriate silencers, mufflers, or acoustic covers. Stationary noise sources should be positioned as far as possible from noise-sensitive areas, with acoustic barriers used if necessary. Additionally, vehicle movement to and from the site will be regulated, and workers will be instructed to follow noise control protocols.

Operational noise, including on-site vehicle movements, was assessed using sound modelling software. Noise surveys for residential areas during both daytime and nighttime indicated that operational noise levels at the nearest homes would be at or below existing background levels, meaning a minor adverse impact is expected. In ecological areas, predicted noise levels remain within threshold values, with only minor effects anticipated.

A cumulative noise assessment, which accounted for other nearby developments, concluded that overall noise levels from both construction and operation would not result in significant impacts when considering the broader context. In summary, noise is not expected to be a major concern for either the construction or operational phases of the project.

12 INFRASTRUCTURE AND UTILITIES

During the construction phase, precautions will be taken to prevent damage to existing infrastructure and utilities near the development site. Although no utilities are located directly within the facility's footprint, the surrounding buffer zone includes pavements, crash barriers, fire hydrants, street lamps, and fencing.

Construction vehicles will access the site from the southern gate, where works related to the second interconnector are also planned. Strict control measures will be implemented in this area to safeguard existing infrastructure.

The proposed route for Enemalta's second interconnector cable passes close to the development site but is separated by a landfill, making any potential impact negligible. Third-party utility providers have confirmed that, apart from the second interconnector, no other utilities are present within the site or its buffer zone. This reduces the likelihood of major service disruptions during construction.

Within the ECOHIVE complex, part of the facility will extend onto agricultural land. In this area, Wasteserv Malta's infrastructure, such as street lamps and perimeter fencing around nearby buildings, may be affected. Some components may require repair or replacement. Coordination with Wasteserv Malta will be essential to prevent accidental damage, and any damage that does occur will be promptly repaired at the contractor's expense. The impact here is considered moderately adverse.

Connecting the facility to water and electricity supplies within the ECOHIVE complex may cause temporary, localised service interruptions, though these are expected to be minor and short-term.

Once operational, the Thermal Treatment Facility (TTF) will strengthen Malta's ability to manage hazardous waste in line with the LONG-TERM WASTE MANAGEMENT PLAN 2021–2030. Importantly, the anticipated increase in site traffic is not expected to negatively affect surrounding infrastructure or utilities.

13 OTHER IMPACTS

13.1 CLIMATE CHANGE AND CLIMATE CHANGE ADAPTATION

The construction of the TTF can have both direct and indirect impacts on climate change. One concern is the loss of rural land to cemented surfaces, which reduces natural groundwater recharge and increases runoff during heavy rainfall, potentially leading to more frequent flooding exacerbated by climate change impacts.

However, building and operating a new TTF also offers significant benefits in combating climate change. Better waste management practices reduces the demand for raw materials, lowers energy consumption, and decreases greenhouse gas emissions associated with the export of certain waste streams.

13.2 ENVIRONMENTAL RISK

The environmental risk study assesses any relevant risks, including major accident scenarios like contamination, emissions, explosions, blasts, flooding and major spillages, which could occur during the phasing of the proposed Scheme.

One-Time Environmental Risks

1. Contamination of geological layers through the spillage of chemicals, oils and fuels
2. Contamination of the Malta Mean Sea Level Aquifer through spillage of oil or fuels
3. Contamination of the surrounding marine environment through the spillage of chemicals, oils and fuels
4. Generation of dust from works which may affect surrounding sensitive receptors
5. Rock/soil instability which could impact nearby ecological/agricultural features of land uses
6. Spillage of excavated material during transportation
7. Dust emissions from transportation of waste rock material
8. Loss of protected endemic vegetation species

Exceptional Environmental Risks

1. Instability of the facility due to earthquakes
2. Damage to surrounding environment from explosion/fire

The environmental risk assessment evaluates the majority of risks to be moderate. High-risk activities are one-time environmental risks associated with exceptional weather events and/or natural phenomena. The assessment concludes that the overall environmental risk associated with the project is of a moderate level. The implementation of appropriate mitigation measures can reduce the severity of the risks.

13.3 HUMAN POPULATION

The study identified a number of impacts on human populations. Predicted impacts during the construction phase include:

- Generation of dust: Reduction in air quality for nearby residents.
- Generation of noise and vibrations: Increase in noise and vibration levels in the surrounding area affecting local residents and nearby commercial premises.

Predicted impacts during the operational phase include:

- Air quality & climate change: The potential for the facility to increase the country's recycling rates would reduce the overall GHGs emitted on a national scale. The TTF emissions are expected to release certain harmful pollutants into the air leading to impoverished air quality and the potential deposition of such pollutants into the soil and water bodies. The assessments carried out have quantified this impact as negligible to minor adverse.
- National waste management sector: New TTF will achieve better recycling results and reduce pressures on landfilling

13.4 MITIGATION

Preventative engineering measures, such as process control automation with verified SIL levels, ESD systems, and pressure relief mechanisms, are designed to prevent incidents. Meanwhile, mitigative measures, including tank dikes, fire detection and extinguishing systems, and drainage systems to collect any liquid from the site, serve to minimize the impact of any loss of containment (LOC), safety, or environmental incidents.

13.5 PROJECT DECOMMISSIONING

The proposed TTF is slated to operate for 20 years, after which decommissioning considerations will be initiated. Key components of the decommissioning planning include preparing initial and final decommissioning plans, gathering necessary data, estimating costs, and securing financial resources for the project. These plans will be submitted for regulatory review and public consultation as per national requirements, ensuring transparency and compliance. Cleanup, removal, and disposal of materials will also be carefully considered.

Various decommissioning options are suitable for the TTF. Facility mothballing involves preserving structures and machinery for potential future use, with government oversight to ensure compliance and environmental rehabilitation. Partial facility decommissioning allows for closure of specific sections while retaining reusable components and managing environmental impacts. Complete site decommissioning entails a comprehensive shutdown to mitigate hazards and prepare the site for safe future use or redevelopment, aligning with health, safety, and environmental regulations. Each approach aims to minimize disruption and ensure responsible handling of the facility's end-of-life phase.