

Phase 3: Environmental Impacts of Designed proposals

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Licking County is located in central Ohio. Heath, a city located in Licking County and his home to an old Meritor factory, which has been abandoned and not put to use since its abandonment. The property also contains a brownfield, which is an area of an abandoned (most likely industrial) property that is contaminated. The property has seen multiple proposals for what it could turn into. However redevelopment of the property has some economical and ecological costs. In order to see what some of the ecological costs would be, research was done on climate, habitat, effects of construction and deconstruction of buildings, different types of pollution associated with construction and deconstruction, brownfields, the impact of weather on brownfields and the environmental impacts of solar panels.

Central Ohio has a continental climate, and is in a temperate zone¹. Central Ohio gets an average of around 39-40 inches of rain per year,² however, that number seems to be rising. It is important to note that the average annual rainfall is rising because that can lead to issues such as flooding. The climate of central Ohio is important to understand because it will help give a more realistic understanding of the ecological costs of this project and a brownfield.

¹ "Ohio Climate." *City-data*, www.city-data.com/states/Ohio-Climate.html.

² Bush, Bill. "Columbus has passed all-time annual precipitation record." *Columbus Dispatch*.

The weather and climate can affect the brownfield and other areas of the property. This is important, as rain can affect watersheds, storm water, and even spread contamination. In many places, severe changes in weather patterns have been destructive to buildings, brownfields and other infrastructure. Some of the destructive costs of brownfields include runoff into local watersheds³. These local watersheds are habitats to many species of wildlife and could also be a source of drinking water for people.

To fully understand the ecological impacts of this redevelopment proposal, it is important to know that Ohio is home to a wide range of birds, mammals, fish, reptiles, fish, amphibians, insects, and other invertebrates⁴. There are multiple types of wildlife which include species of concern, endangered species, and threatened species in Licking County Ohio; including multiple species of birds, reptiles, amphibians, mammals, fish, and insects⁵. Ohio is home to a wide variety of plant life as well, including many trees, flowers, grasses, and more. The plant life is an important staple in central Ohio's climate, as it helps feed and house animal life, as well as help with air quality. The project can affect the plant life in central Ohio by affecting watersheds, and spreading toxicity through soil. The project could affect the plants and animals of

³ Unintended Impacts of Redevelopment and Revitalization Efforts in Five Environmental Justice Communities." *Environmental Protection Agency*, Environmental Protection Agency, www.epa.gov/sites/production/files/2015-02/documents/redev-revital-recomm-9-27-06.pdf.

⁴ "Species of concern in Licking County." *ODNR*, Ohio Government, wildlife.ohiodnr.gov/portals/wildlife/pdfs/species%20and%20habitats/state-listed%20species/licking.pdf.

⁵ Species of concern in Licking County." *ODNR*, Ohio Government, wildlife.ohiodnr.gov/portals/wildlife/pdfs/species%20and%20habitats/state-listed%20species/licking.pdf.

concern, as well as other species in the area; this project could potentially affect animal life and natural habitats negatively in many ways, including solid waste, sound pollution, and the brownfield could also contaminate other areas, if not properly remedied. This would also affect the animal populations which rely on these plants for food, and shelter. It could also affect air quality and water quality, as watersheds are used by people for hydration, and agriculture.

To better show the environmental impacts of this brownfield, it could be compared to other brownfields on similar sites in central Ohio. One of these brownfields is the Newark Wastewater Treatment Plant. The Newark Wastewater Treatment Plant is a wastewater treatment plant in Newark. It was originally the Newark Processing plant, and its previous use was aluminum processing⁶ however, it was abandoned and redeveloped as The Newark Wastewater Treatment Plant. The Newark Wastewater Treatment Plant is a good comparison because it is in the same geographic region of Ohio, and also contains the solar array; another part of the proposed redevelopment design⁷. The brownfield at the Newark Wastewater Treatment Plant is closely monitored for, plant life, as plant life still not able to fully grow there, and if plant life were to grow, it could potentially fracture the cap system in place. This is because the root systems of most plants have a hard time breaking through a cap. Caps are semi or non

⁶ *Ohio Brownfield Database*,
epawwwextp01.epa.ohio.gov:8080/ords/epaxp/f?p=109:4::NO::P4_APPLICATION_ID:1033.

⁷ Curry, Bryan. "Wastewater Treatment Plant." *NewarkOhio.net*,
www.newarkohio.net/city-services/water-wastewater-main/waste-water-plant.

permeable systems which are important to brownfields because they help contain the amount of contamination underground⁸.

The solar array will most likely provide enough solar energy to power the proposed project as well as other parts of Newark Ohio. Despite having a low carbon footprint during their lifespan, that does not account for the post lifecycle of solar panels. There are many environmental costs of solar energy. Some of these costs include water usage, use of hazardous materials, as well as the birth-post mortem cycle⁹. The life cycle of solar panels is approximately twenty five years,¹⁰ after which most solar panels become too inefficient to use. However, after twenty five years, parts of solar panels are often partially recycled; while others are harder to recycle and often end up as waste, which are hard to recycle¹¹. The parts of the solar panels that cannot be recycled are often times heated up and use a significant amount of energy to breakdown. This is important to note for the ecological impacts, as it raises the question about future ecological impacts of the proposed redevelopment.

Redeveloping deserted properties is good for the local economy, and is good for repurposing properties in many ways. Redeveloping properties can help with economic stimulation, saving space, and overall help curb the environmental and economic costs

⁸ "TECHNICAL GUIDANCE ON THE CAPPING OF SITES UNDERGOING REMEDIATION." *New Jersey Government*, New Jersey Government, www.nj.gov/dep/srp/guidance/srra/capping_remediation_sites.pdf.

⁹ "How Long Do Solar Panels Last?" *Civicsolar*, www.civicsolar.com/article/how-long-do-solar-panels-last.

¹⁰ "Environmental Impacts of Solar Power." , 5 Mar. 2013, www.ucsusa.org/resources/environmental-impacts-solar-power.

¹¹ "The Opportunities of Solar Panel Recycling What Happens to PV Panels When Their Life Cycle Ends." , 11 Nov. 2019, www.greenmatch.co.uk/blog/2017/10/the-opportunities-of-solar-panel-recycling.

of developing new buildings. . Despite having some environmental positive effects of redeveloping a property, there are many negative effects of redeveloping a property. Some of these effects include possible litter, solid waste, and other forms of pollution, including solid waste and sound pollution.

One negative aspect of redevelopment is pollution, including sound and solid waste, as well as other forms of pollution. Taking down a building, and renovating a building means there will be debris, and other solid waste. To combat this, many construction sites use dumpsters and landfills. However, there is also the worry of left over solid waste, and debris which could hurt wildlife if wild animals and what not try to consume the trash and left over debris, or if it renders them unable to move, or it could provide wildlife with an artificial habitat, only to hurt said wildlife in the near future. Leftover debris and solid waste are not the only things that could hurt wildlife. There are multiple negative impacts of landfills¹². One way landfills could potentially harm wildlife is by potentially contaminating nearby habitats, and watersheds. Redevelopment not only affects "on site" wildlife (wildlife that lives near or in the area being redeveloped and lives close enough to the site to directly impact said site). Redevelopment can lead to fragmentation and disruption of offsite wildlife¹³ (wildlife that lives near the site, however not close enough to the site to directly affect it). The effects that construction and

¹² Harris, Tom. "How Building Implosions Work." *How Stuff Works*, science.howstuffworks.com/engineering/structural/building-implosion.htm.

¹³ "Construction." *Business And Biodiversity*, www.businessandbiodiversity.org/construction.html.

deconstruction have on the nearby wildlife can affect movement patterns, feeding patterns and even breeding patterns in many species¹⁴.

However, solid waste and worry of noise pollution do not fully account for the environmental impact of a building teardown; there is also embodied energy. Embodied energy is defined as the environmental costs of the production of the building, gathering resources, and the production of resources that were used to build it¹⁵.

Sound pollution is also a concern. Many, if not most building demolitions utilise explosives. These explosives can cause sound pollution, even if temporarily. The effects of sound pollution can be devastating to local wildlife, and cause long lasting impact on wildlife and wildlife populations. Sound pollution can affect the hearing of animals, and can cause disruptions in wildlife communication, movement, and mating cycles¹⁶. Sound pollution can also lead to differences in other behaviours as well.

The proposed redevelopment project would be great for the economic development this project could have on Licking County; however, it could also potentially have devastating and long lasting effects on local wildlife and habitats. These habitats are important, as they are home to number of species, a number of which are endangered, or of concern. There is no way to tell if the negative effects outweigh the positive effects, solely based on an ecological standpoint, as redevelopment can cause many problems, leaving the property and brownfield can also

¹⁴ "Construction." *Business And Biodiversity*, www.businessandbiodiversity.org/construction.html.

¹⁵ "Effects of Teardowns." *Chicago Metropolitan Agency for Planning*, Chicago Metropolitan Agency for Planning, www.cmap.illinois.gov/about/2040/supporting-materials/process-archive/strategy-papers/teardowns/effects.

¹⁶ Shannon, Graeme, et al. "A synthesis of two decades of research documenting the effects of noise on wildlife." *Wiley Online Library*, onlinelibrary.wiley.com/doi/full/10.1111/brv.12207.

be quite devastating as well. The overall positives from multiple different perspectives outweigh the negative effects from multiple different perspectives. The negative effects the proposed redevelopment could have on these habitats, and the wildlife as well, could potentially be mitigated, if work on some affected areas could be remediated, if there is any need for remediation.

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