Blasting and Flyrock Hazards: A Significant Public Safety Risk

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September 7, 2024

Executive Summary

This report addresses the significant public safety risks associated with blasting operations at the proposed LCP Quarry in Brechin. Flyrock, a byproduct of quarry blasting, is inherently unpredictable and has been responsible for numerous incidents of property damage, injuries, and fatalities. The lack of adequate regulatory oversight and enforcement exacerbates these risks, making the proposed LCP Quarry an unacceptable threat to public safety. The report draws on a wide range of studies, technical assessments, and case studies to demonstrate that flyrock hazards present a severe risk to the residents located in the vicinity of the proposed LCP Quarry operation.

Introduction

Blasting is a core component of aggregate extraction at quarries, including the proposed LCP Quarry close to Brechin. While necessary for breaking rock, blasting poses a significant danger to both workers and nearby communities, primarily through the unintended release of flyrock—rock fragments that are ejected during a blast. Flyrock can travel hundreds of meters beyond the blast site, posing a grave risk to life and property.

Despite advances in blasting techniques, the occurrence of flyrock remains unpredictable due to a variety of factors, including blast design errors, unforeseen geological conditions, and the natural variability in rock formations. Given the proximity of residential areas and public spaces to the proposed LCP Quarry, flyrock hazards must be viewed as a serious public safety concern.

Flyrock Hazards: Key Findings from Studies

1. Unpredictability of Flyrock

Flyrock occurs when the energy generated by explosives exceeds the containment capacity of the surrounding rock. Studies have shown that **even with precise calculations and modern blasting techniques, flyrock remains difficult to predict.** This unpredictability is influenced by factors such as improper burden, excessive charge, and shallow blast holes, which can all lead to the unintended ejection of rock fragments [1].

A comprehensive review of blasting incidents revealed that **flyrock can travel as far as 900 meters**, far beyond the typical safety zones established around quarries. This places nearby communities at significant risk, particularly if residential or public areas fall within this range [2].

2. Documented Flyrock Incidents

Numerous case studies document the dangers of flyrock. Flyrock incidents have caused fatalities, severe injuries, and extensive property damage. For example, in the 2017 Belize quarry incident, flyrock traveled more than 800 meters, resulting in multiple fatalities, including Ronald Sutherland (an experienced Canadian blaster), as well as extensive damage to nearby properties [3].

The “Blasting and Gaslighting” report emphasizes that despite advancements in explosives technology, flyrock continues to pose an unacceptable risk in residential and urban areas near quarries. The lack of consistent blast monitoring and inadequate buffer zones further contribute to these risks [4].

Inadequate Regulatory Oversight

Ontario's current regulatory framework for quarry operations, as governed by the Aggregate Resources Act (ARA), lacks sufficient enforcement to ensure the safety of nearby communities. The Ontario Auditor General's 2023 report highlighted several deficiencies in the oversight of quarry operations, particularly in terms of blasting safety and monitoring [5].

1. Lack of Comprehensive Inspections

The number of inspections of aggregate sites has decreased over the last five years, and fines for non-compliance are rarely enforced. This raises concerns about the ability of regulatory bodies to adequately monitor blasting activities and prevent flyrock incidents. Given the high stakes of flyrock hazards, the absence of regular inspections is alarming [6].

2. Inadequate Setbacks

Setbacks—the minimum required distances between a quarry and nearby properties—are often insufficient to protect against flyrock. Studies have shown that flyrock can travel distances far exceeding standard setback requirements. The lack of updated regulations to reflect modern blasting practices puts both workers and the public at risk [7].

Flyrock and Public Safety in Brechin

The proposed LCP Quarry in Brechin is situated near residential communities and public spaces, increasing the likelihood that flyrock could result in significant harm. Given the documented unpredictability of flyrock and the deficiencies in regulatory oversight, the safety risks are too great to justify the approval of the quarry license.

1. Risk to Residents

Residents living near the proposed quarry site would be directly exposed to flyrock hazards. The risk of injury or death from flyrock, coupled with potential damage to homes and infrastructure, makes the current setback distances inadequate. The unpredictability of flyrock adds to the uncertainty, meaning that even with safety measures in place, the risk cannot be eliminated [8].

2. Impact on Public Infrastructure

Public infrastructure, including roads and utilities, is also at risk from flyrock. Damage to infrastructure not only poses direct financial costs but also affects the safety and well-being of the broader community. This could lead to disruptions in services and further increase the risks associated with quarry operations [9].

Conclusion

The dangers posed by flyrock during blasting at the proposed LCP Quarry present a significant and unacceptable risk to public safety. The unpredictability of flyrock, combined with insufficient regulatory oversight and inadequate setback distances, means that nearby communities are exposed to potential injury, property damage, and fatalities. As such, the license for the LCP Quarry should not be granted.

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