Introduction

Ontario is the economic engine of Canada in the several sectors – manufacturing, agriculture and resource extraction. The first two of these depend on Ontario's rich resources. This paper will focus on resource extraction knowing that while it seems to support economic activity and therefore communities, it actually undermines the environment necessary to sustain communities and agriculture. Further, this paper will discuss the relationships between the extraction industry and the province at community, municipal and provincial levels. These relationships are complex and costly for the province. As a wise woman said "Gravel is complicated". While mining and forestry are also resource extraction industries, and while there are parallels and analogies between those and the extraction of aggregate, it is on the rock, sand, clay and gravel that this paper will focus.

Extraction creates an economic boost?

It is commonly believed that gravel pits or quarries create jobs. Community members see trucks coming and going. Municipalities see some portion of the levy coming to their limited coffers. Machine operators, blasters and other labour are required, and often live in nearby communities. This appearance of economic activity is deceptive: When the economy is active, there is demand for aggregate for a variety of uses; the extraction does not create the economic conditions but rather is a response to economic conditions. So, stimulus to extraction either by incentive measures or lightening some part of the industry's responsibilities is not a positive economic boost. The aggregate industry allows pits and quarries to remain dormant for decades between contracts without major economic impact on the surrounding communities, though with consequences for the environment only somewhat less than those during active periods.

Aggregate extraction has multiple costs for the province. The bulk of gravel, stone and sand are bought by municipalities and the Province. Roads and bridges consume them in their raw and processed states; the bills land on the desks of government officials and are paid by the public. The industry in Ontario is largely

weighted to multi-national corporations who are the players in the large projects which governments undertake. When a local municipality is contracting for materials and/or road work, they often find that the local company is owned by a larger one. This structure of the industry means that money flows out of Ontario to corporate head offices. That net outflow reduces the economic value of Ontario's economy. It would be better if Ontario's road construction were sourcing its materials from local producers which would result in much higher direct and indirect investments in Ontario than that to be anticipated from international bankers.

Extraction takes away!

By its very nature, extraction takes valued resources from the environment. Where this results in greater value in a full-cost equation, this could be deemed a good thing. In Ontario, Canada's most southerly province, agriculture is the largest industry. Because food travels from food to table, it engenders multiple additional jobs and processes along the way. Farmers work at planting and sowing; food processors work at capturing the flavour and nutrition; warehousing and transportation move the goods to local, national and international markets and consumers. Contrary to the extraction of cash from Ontario's economy, this results in an inflow to farm owners and their employees.

The vital contribution of agriculture to the province relies on a precious resource – topsoil. Fertile lands in Southern Ontario are valued around $30 000 an acre. Given that 6 inches of topsoil is largely what generates this price, we can see its extraordinary monetary value. When extraction occurs, however, topsoil ceases to be available for agriculture. Worse, when it is shaped into berms alongside pits and quarries in a vain attempt to hide their view from passersby and to prevent waves of dust from sailing over, topsoil's microbial life ends, so soil fertility is damaged. That loss to agricultural potential is costly. In light of the extraction industry's negative impact on agricultural lands already under significant pressure, and in light of the presence of vast numbers of dormant and relatively inactive pits, there is an argument to be made for the closure of the pit license application process in Ontario. Under that balanced approach, agricultural and

recreational land uses would produce economic growth while inefficient and under-utilized operations would be rationalized.

Extraction costs in municipal and provincial road work.

The costs of extraction industries are largely borne by the public. This is a highly inefficient way to do business because it means that cost accounting is done by multiple public agencies at several levels. Municipalities' budgets are strained by the load which extraction puts on roads. Each new pit adds the potential for new stretches of road to require upgrading and resurfacing of haul routes. This extracts vital funds from road maintenance budgets that are needed to respond to winter conditions, for regular repairs or to replace surfaces which were paved with substandard materials in the same way as the Province experienced significantly short lifespans. This cost was created when contaminated aggregate was substituted for quality.

Currently, when aggregate moves longer distances, it travels on provincial highways. They are routinely pummelled by overloaded trucks. The Ministry of Transport inspections have revealed 10 to 20% excess loads on gravel trucks, representing an undue strain on roads, as well as a significant safety hazard. The costs of accidents on public highways are immeasurable when they take lives. Even when they do not, they spread costs among fire departments, local and provincial police forces, road repairs and reconstruction when surfaces are damaged or guard rails ploughed aside by trucks, and the high costs of hospitalization and rehabilitation of the injured. When gravel trucks crash, everything stops! – The vital movement of goods from producer to consumer, of just-in-time parts to manufacturers, of business people to their time-sensitive meetings or of workers to their punch-clock jobs are all affected adversely by the poor safety record of aggregate hauling. The aggregate industry needs to reconsider the how, the when and the why of hauling rock and smaller products around the province.

Aggregate does not need to move by truck. Were it to move by longer distances train, for instance, the infrastructure would be private and under federal jurisdiction reducing costs and liability for the Province. There are existing

examples, particularly in Alberta, of efficient use of railways to move aggregate. Further, shipping aggregate by boat is practised in Ontario and could relieve the strain on current roads and/or the need to add lanes or highways.

Aggregate Costs the Public's Health

While aggregate production is supposed to be an "interim use", its duration is such that it has significant health and other impacts on neighbouring communities. Dust produced during extraction routinely leaves the pit areas and spread to "sensitive receptors", i.e., people. Included in that dust output is fine particulate matter, of under 2.5 microns in size, which a series of research papers including those by Public Health – Ontario, reveal to damage lungs, hearts and brains. That direct impact is complicated by yet another factor of quarrying, the haulage by diesel trucks whose negative impacts include the emission of fine particulate especially when idling at entry gates, loading or exiting and when accelerating from pits onto roads. While fine particulate matter is invisible to the human eye, the belching black fumes are seen by our eyes, sensed by our noses and suffered by our lungs. The presence of dust and fine particulate matter in the air engenders massive costs in health for members of the public and the public system offering it, as well as shortening productive life spans. Human conditions are economic conditions.

Public health is affected too when water quality or quantity from private, community or municipal wells is undermined by dewatering of pits, by below-the-water-table extraction, by the loss of filtration values of overburdens and gravel deposits, the diminution of headwater recharge zones as well as effects on surface water. When pits are dewatered, water tables fall, necessitating deeper drilling of wells. This costs well-owners. When pits open ground water to the sky, run-off, deposition from the air and other vectors can add contaminants to drinking water, necessitating more expensive filtration and treatment. When deep sand and gravel layers are removed above the aquifer, the rapid infiltration of water means that the filtering process supplied naturally by the sand and gravel as in moraines, drumlins and alvars is lost. Emerging science provided by toxicologist Poh-Gek Forkert and others points to the need for filtration and

entrapment of a number of toxins used currently, or historically and now banned. When source water recharge zones become smooth surfaces like roads, pits, parking areas in quarries, water sources dry up. There is unanimous agreement in the Legislature, for instance that “The Paris Galt Moraine is an essential water recharge area in Ontario’s largest watershed – the Grand River Watershed – purifying water at no cost to the citizens” and that “This is about conserving what nature can do for free, so I cannot think of a more fiscally responsible solution. Failure to act could put the government on the hook for hundreds of millions in water infrastructure”. This applies broadly across the province as does the necessity to sustain wetlands. Wetland loss has resulted in significant reductions in groundwater and surface water which effects domestic and industrial uses of water, and therefore has significant economic impact. If any of these processes allows chemical and/or biological contaminants to reach drinking water, the tragic results, like those at Walkerton, are immediate, early or painfully slow deaths. Dollars and cents don’t make sense of these losses.

Extraction is No Limit

There is no indication that Ontario needs any more gravel, rock, sand or clay. Not a single road, bridge or highway has come to a halt because of a lack of supply. Not a single skyscraper or foundation has been prevented because no aggregate was available. In fact, as regards roads, every indication is that Ontario uses too much aggregate in building them, the highest in Canada despite harsher climates elsewhere, and higher than adjacent American states where traffic volumes match or exceed ours. Is the province over-consuming and paying the price. Innovations in building materials see more and glass and steel in use, vastly diminishing the quantities of aggregate needed directly or indirectly. The resurgence of wood in exterior and interior construction suggests that this renewable resource might be more efficient as well as sustainable than a finite supply of aggregate. There seems little risk that potters will run out of mud.

Fortunately, Ontario’s ‘finite’ supply is close to infinite. The report prepared for the MNRF by Larry Jensen, an accredited geologist, analyzes licences across the province and predicts from them a 100 to 200 year supply with existing licenses.

From that you would deduce that Ontario needs no more licenses to be issued, freeing up MNRF staff to effectively monitor and enforce policies in an equitable and consistent manner and even to assist operators in the efficient workings of their equipment. (One inspector on a noise complaint realized that the screeching which produced calls to the office was a bearing that would cost thousands to replace and would result in long down-time. He recommended lubricants. Neighbours and employees had a more pleasant experience after lubrication and the gravel pit saw economic benefit). Additionally, MNRF staff could also be deployed to determine the actual amount of virgin aggregate available when accurate data has not been available beyond the licence amounts. To those efficiencies could be added a drive to rehabilitate the approximately 7 000 abandoned pits across the province, restoring them to productive uses, agricultural, recreational or other, and getting the province back on track with the work to move other depleted sites out of post-extractive neglect and into the hands of willing landowners. There is no crisis in supply; there wasn't in the 1970 despite industry crying "Wolf" and there won't be in the foreseeable future.

Ontario is further supplied with stone or crushed product when reprocessing occurs. This increases Ontario's supply and the horizon for adequate availability. It also moves from an intense consumption of energy to less one. While traffic is slowed by a machine which removes, melts and reapplies asphalt to roads, it is not brought to a stop as when truckloads of damaged road surfacing materials are hauled away, and new cement or asphalt is laid. Recycled aggregate has home uses as well, crushed brick pathways for example, when houses give way to higher and/or more modern structures. This industrial process also creates jobs in the proximity of the new project while saving provincial costs associated with haulage as previously described. Aggregate can be part of a circular economy, and by doing so can be perceived as both for the people who benefit from the jobs and the speed of transition from wreckage to new construction and for the people who live in rural areas which are spared destruction.

Three Heads are Better than One

The value of public consultations is that they bring together stakeholders from multiple sectors: those who work in the field, such as industry and ministry; those who live beside the field, such as individuals and community groups; and, scientists, such as academics whose research provides emerging knowledge which can result in current and future savings and accredited qualified consultants. Regarding the science community, we might have hoped that emerging science were more carefully listened too before the release of heavy liquid metals into the waters around the Reed Paper Mills, and might want to harken to the warnings that qualified consultants working with the best current knowledge and ethical interests would apply to operations and rehabilitation of aggregate extraction sites. It is fitting that aggregate policy be for the people who live with it, pay for it, and require it (and especially robust worker safety and residential health standards) for their continued benefit. Since industry players are in competition with each other, we should not have been surprised to see the collapse of the CornerStone Standards, nor the conflict among small versus large (and therefore international) companies evident in multiple cases. That leaves ministry staff to carry out the policy role, which means that some proponent-driven processes which the industry currently claims to struggle with could become the work of the Ministry of Natural Resources who would manage the processes, provide expertise, consult with the local, broader and scientific community, and to regulate in an equitable fashion extraction from approved sites in the interests of the people. Democracy is for the people and continues to engage people in decisions.

Recommendations

1. Adopt a balanced approach where agriculture and public investment outweigh the narrow interests of one small segment of resource extraction.
2. Stimulate the Ontario economy through a broad variety of investments in emerging industries, resource recovery, cost efficiencies, and broad consultations with stakeholders.
3. Encourage the location of industry in Ontario through procurement practices that prioritize local ownership and head offices.
4. Quantify resources; determine quality; and conserve the irreplaceable.
5. Show respect for the people as individuals and in community groups in a way that recognizes the profound attachment of rural people to productive land.

Ontario on the Rocks

A Report on the Economic, Social and Environmental Consequences of Resource Extraction

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