



RESOURCE MANAGEMENT REPORT
MINES, MINERALS & AGGREGATES
FOR THE
COUNTY OF HASTINGS OFFICIAL PLAN REVIEW

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PLANNING AND DEVELOPMENT DEPARTMENT
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MINES, MINERALS AND AGGREGATES

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MINES, MINERALS & AGGREGATES

1. Introduction

Mineral aggregates, which include bedrock-derived crushed stone as well as naturally formed sand and gravel, constitute the major raw material in Ontario's road-building and construction industries (Ontario Ministry of Natural Resources, 1987). Very large amounts of these materials are used each year throughout the Province. As such, these resources are significant to the economic wellbeing of both Hastings County and the province of Ontario and should be managed accordingly. In 1975, the Proctor & Redfern Group, and Gartner Lee Associates conducted a mineral aggregate study for the MNR entitled *Mineral Aggregate Study & Geological Inventory: Part of the Eastern Ontario Region*. In 1987, the Ministry of Natural Resources (MNR) wrote a report entitled the *Mineral Aggregate Resources Inventory of the County of Hastings: Southern Ontario*. The purpose of these reports was to identify areas best suited for possible extraction and to provide the required information so potential mineral aggregate resource areas could be included in planning strategies and the Official Plan (Ontario Ministry of Natural Resources, 1987). Comprehensive planning and resource management strategies have been advised by the MNR to ensure prudent use of available resources, especially in areas of rapid development. Such strategies must be based on a sound knowledge of the total mineral aggregate resource base at both local and regional levels (Ontario Ministry of Natural Resources, 1987). The following sections have been written using information detailed within the MNR reports.

2. Executive Summary

The Ministry of Natural Resources have provided two aggregate inventory reports, one written in 1975 and one in 1987, with the aim of identifying areas best suited for possible extraction and to provide the required information so potential mineral aggregate resource areas could be included in planning strategies and the Official Plan (Ontario Ministry of Natural Resources, 1987). These reports offer detailed information on the physiography and geology of Hastings County and catalog the volume of potential aggregate reserves in each township.

Hastings County is composed of five physiographic regions: the Algonquin Highlands, the Georgian Bay Fringe, the Dummer Moraine, the Peterborough Drumlin Field, and the Napanee Plain (Ontario Ministry of Natural Resources, 1987). The landscape in the northern townships is characterized by outcrops of bare rock and till-covered ridges. Southern Hastings is typified by rough, stony terrain. The extreme southern portion of the County is a flat to wave-like plain with very little overburden (Ontario Ministry of Natural Resources, 1987).

High quality aggregates can be found in many townships in Hastings County, although in some cases they can only be produced through processing of lesser quality material. The townships of Carlow/ Mayo, Cashel, Dungannon, Faraday, Limerick and Hastings Highlands contain Class "1" material (Ontario Ministry of Natural Resources, 1987). According to the report, reserves in the townships of Madoc, Hungerford, Huntingdon, and Hastings Highlands have good development potential and may provide high quality aggregate (Ontario Ministry of Natural Resources, 1987). With beneficiation, high quality aggregate meeting Class "1" or "2" specifications may also be produced from materials found in Limerick, Tudor, Carlow, and Wollaston. Despite the substantial reserves of sand and gravel resources in Hastings, disparities in supply exist from one township to another. To alleviate disparities and to ensure future supply, reserves must be carefully managed and used wisely (Ontario Ministry of Natural Resources, 1987). Only a few pits within the County supply material on a regular basis. The county has an adequate supply to meet local demand needs but little potential for export. Also, the quality of the material is quite variable which limits its potential (Ontario Ministry of Natural Resources, 1987). Of the northern townships, Monteagle, Mayo, McClure, Wicklow, Herschel and Faraday had the greatest reserves of available aggregate in 1987. Madoc, Hungerford and Huntingdon had the greatest reserves

of available aggregate of all the southern townships in 1987 (Ontario Ministry of Natural Resources, 1987).

With legislation now protecting the Oak Ridges Moraine, demand for gravel and other construction materials is expected to increase in areas outside of the Toronto area. Deposits before considered uneconomic due to trucking costs may be more viable in the future.

Some deposits are valued for other functions than extractive uses, such as groundwater recharge and potential cultural resources. Care should be given before approving extractions or re-designation of deposits to other uses.

The County also contains extensive areas with recognized mining potential of a variety of deposits. As commodity prices are expected to continue to rise, and as the mining industry develops more efficient approaches to discovery, extraction and processing, the mining industry is likely to grow in importance. Challenges expressed by mining industry proponents are:

- the Province is unwilling to support mining in southern Ontario (south of North Bay) with grant programs to the same extent as northern Ontario
- Approvals for new operations is difficult among federal, Provincial, and municipal agencies.
- Too many rural residential uses are encroaching on mineral and mining resources areas making it very difficult to meet compatibility requirements in terms of dust, noise, and groundwater impacts.

Therefore, the County Plan should simply approvals where possible and the County should take a co-ordinating role to facilitate technical reviews and approvals. Areas having mining potential should be identified on land use schedules and non-compatible developments should be directed to locate elsewhere so that mining operations can occur without conflict with residential uses.

Many new licensed extraction sites have been granted (grandfathered) under the new Aggregate Resources Act. The County is in receipt of most of these new sites. Licensed areas should be appropriately designated in the updated Plan.

The Hastings County Planning Department continues with ongoing consultation with MNR and MNDM staff to achieve the following:

1. Identify what mineral/mining features are shown but are no longer viable operations (license is expired etc.);
2. Identify what mineral/mining features are shown but are no longer viable operations due to the close proximity to sensitive lands uses such as settlement areas;
3. Identify what mineral/mining features are NOT shown and should be due to the significant value/quantity of materials – or are currently undertaking licensing applications. The Planning Department would include deposits that may be only locally significant (local construction projects, sands for septic systems, etc.), but not deposits that may be non-commercial; and,
4. Sites of abandoned mines that represent a hazard to human health or safety.

3. Analysis

3.1. Overview of Mineral and Aggregate Resources in Hastings County

3.1.1. *Physiography*

The physiography of Hastings County can be divided into three sections – Northern Hastings, Southern Hastings, and the Napanee Plain. Northern Hastings encompasses two physiographic regions – the Algonquin Highlands and the Georgian Bay Fringe. These regions are characterized by outcrops of bare rock. The landscape can be described as rough with thinly till-covered ridges. Southern Hastings is typified by the Dummer Moraine with its rough, stony terrain. Due to the presence of the Peterborough Drumlin Field, drumlinized till plain is also found in Southern Hastings. The Napanee Plain makes up the

extreme southern portion of the County. It is a flat to undulating limestone plain with very little overburden (Ontario Ministry of Natural Resources, 1987).

3.1.2. Quaternary Geology

Drumlins can be found throughout Northern Hastings. Where the till overlies bedrock, its texture is generally loose, stony sand. The till plain in Southern Hastings has a texture that ranges from a gritty, silty sand to sand, and is moderately stony and compact. The till can also be extremely stony and contain pebbles or even large boulders in some areas (Ontario Ministry of Natural Resources, 1987).

3.1.3. Bedrock Geology

Bedrock aggregate resources occur exclusively within the southern portion of the County with significant areas of bedrock exposure occurring throughout the southeast corner of the County and in Rawdon, Marmora, and Madoc Townships (Ontario Ministry of Natural Resources, 1987). Class “1” and “2” materials are of high quality. Aggregate in the Class “1” category is generally acceptable for asphalt and/or concrete uses and is the highest quality aggregate. Class “1” materials can be found in Hastings County. Significant volumes of Class “2” material are found in Tyendinaga, Hungerford, Rawdon, Marmora, and Madoc Townships (Ontario Ministry of Natural Resources, 1987). Class “3” aggregate may include material processed from reclaimed asphalt concrete, portland cement concrete, lean concrete base, cement treated base or a combination of any of these materials. Substantial reserves of Class “3” bedrock aggregates resources are found in Tyendinaga (Ontario Ministry of Natural Resources, 1987).

3.1.4. Possible Crushed Rock Resources

Most quarries within Hastings County were identified as inactive, or in various stages of abandonment. The potential to extract crushed rock from the Gull River and Bobcaygeon Formations is particularly great in Marmora, Rawdon, Huntingdon, Hungerford and Tyendinaga Townships (Proctor & Redfern Limited, Gartner Lee Associates Limited, 1975). However, quality problems do exist with these formations that restricts their use in some cases for asphalt or concrete (Proctor & Redfern Limited, Gartner Lee Associates Limited, 1975).

3.1.5. Possible Sand & Gravel Resources

There are approximately 158 million cubic metres of available sand and gravel resources in the County of which 35% meets the high quality specifications of Class “1” and Class “2” material. Hungerford, Huntingdon, and Madoc have over 65% of the available sand and gravel while Grimsthorpe, Lake and Tudor collectively only have approximately 3% of the available material.

The gap in supply that is experienced from one area of the County to another can be alleviated by carefully managing the reserves and by using bedrock resources only where economically feasible (Proctor & Redfern Limited, Gartner Lee Associates Limited, 1975).

Extensive reserves of sand and gravel are found within Northern Hastings – over 75% of which fall in the non-crushable category. Carlow, Faraday, Mayo, McClure, Monteagle and Wicklow have over 85% of the crushable material. To ensure that adequate reserves of both crushable and noncrushable material exist for future demand, careful management of these resources is recommended (Proctor & Redfern Limited, Gartner Lee Associates Limited, 1975).

Only a few pits within the County supply material on a regular basis. The potential sources of material which are most viable are found in Huntingdon Township. The remainder of Hastings has a poor supply of aggregate materials from surficial landforms. The County has an adequate supply to meet local demand needs but little potential for export. Also, the quality of the material is quite variable which limits its potential (Proctor & Redfern Limited, Gartner Lee Associates Limited, 1975).

3.1.6. Related Functions to Sand and Gravel Deposits

Other functions of deposits of geofluvial materials include:

- groundwater retention or discharge
- cultural heritage resources can often be found in parts of deposits, particularly where adjacent water resources are found.

Care should be given before approving development of deposits that impacts on groundwater an cultural resources are considered.

3.2. Overview of Mineral and Aggregate Resources by Township

It is important to note that the studies used in the following sections were written in 1975 and 1987 and may no longer be accurate. Reserves could now be depleted in some areas due to mineral aggregate extraction over the past 20-30 years. More recent publications on mineral aggregate resources in Hastings County could not be found at the time this report was written.

Table 1: Available aggregate using statistics gathered for 1975 MNR study

Township	Available Aggregate (1975) in millions of tons	
	Sand & Gravel	Crushed Rock
Hungerford	26.3	4065.2
Huntingdon	45.5	1934.4
Madoc	21.2	296.3
Marmora	23.9	955.7
Rawdon	10.0	980.3
Tyendinaga	14.6	4784.0

Table 2: Available aggregate using statistics gathered for 1987 MNR study

Township	Available Aggregate (1987) in millions of cubic metres
Elzevir	5.36
Grimsthorpe	1.64
Hungerford	22.01
Huntingdon	23.04
Madoc	21.86
Marmora	11.45
Rawdon	8.18
Tyendinaga	9.87
Lake	1.36
Limerick	8.68
Tudor	1.35
Cashel	4.28
Carlow	33.77
Mayo	82.96
Bangor	8.29
Wicklow	76.23
McClure	77.25
Herschel	66.45
Monteagle	95.04
Wollaston	7.82
Dungannon	40.33
Faraday	65.63

3.2.1. Southern Townships

3.2.1.1. Elzevir

The MNR report was written in 1987 and at that time, 5.36 million cubic metres of sand and gravel were available within Elzevir Township of which 70% was within two reserve areas. These deposits were not expected to support any large scale extraction activities, but were considered good sources of low quality material (Ontario Ministry of Natural Resources, 1987).

3.2.1.2. Grimsthorpe

Within the northeastern portion of Grimsthorpe, the MNR identified 1.64 million cubic metres of aggregate available for extraction that met Class "3" specifications. The material is suitable as a local source for road-base aggregate (Ontario Ministry of Natural Resources, 1987).

3.2.1.3. Hungerford

In 1987, Hungerford had the second largest volume of aggregate in the southern portion of Hastings County with an estimated 22.01 million cubic metres of material. The largest deposit was the Tweed esker. Portions of the esker ridges had up to 60% coarse (crushable) materials. However, the ridges would meet only Class "2" and "3" specifications. The second largest deposit was the Marbank esker. This esker would meet only Class "3" specifications. There was one other large aggregate source in Hungerford which also only met Class "3" specifications. The extremely poor quality of the material limited the possible uses. The remaining deposits within the township were said to have only limited potential (Ontario Ministry of Natural Resources, 1987).

3.2.1.4. Huntingdon

Of all the southern townships, Huntingdon had the largest aggregate reserves. An estimated 23.04 million cubic metres of material remained in 1987, of which 19% met Class "1" specifications. Class "1" material could be found in the largest deposit located east of Ivanhoe, and within the second largest deposit, an ancient beach at Pancake Hill. The third largest deposit within Huntingdon was part of the Tweed esker. According to the report, the esker's silty sandstone was of poor quality restricting the material's possible uses. Esker ridges located along the base of Pancake Hill made up the fourth largest deposit. In certain portions of the esker, better quality material existed, but by and large would only meet Class "2" and Class "3" specifications. The high quality materials were generally found in the higher elevation beaches (Ontario Ministry of Natural Resources, 1987).

3.2.1.5. Madoc

In 1987, 21.86 million cubic metres of aggregate were available in Madoc. However, possible uses for this material had been constrained due to extreme quality problems. The largest resource extended from Cooper to Queensborough and was composed mainly of Class "3" material. Located north of Madoc was another large aggregate source which was also of poor quality (Ontario Ministry of Natural Resources, 1987).

In 1975, quarry activity in Madoc was seen to have great potential for future development. Bedrock resources were large in the area and there was good potential for development. Sand and gravel resources could be found within the township but the thickness, quality and continuity of the deposits was quite variable. The reserves were said to be adequate for local uses, but limited in their potential to be used for export (Proctor & Redfern Limited, Gartner Lee Associates Limited, 1975).

3.2.1.6. Marmora

Marmora Township had 11.45 million cubic metres of remaining material in 1987. However, severe quality problems limited the possible uses of the aggregate. The deposits found within Marmora are generally outwash in the form of deltas, fans and channels. The largest reserve in the township could be found east of Fildar Rapids. Other large aggregate reserves occurred east of Cordova Mines, another near Malone and the last could be found southeast of Twin Sister Lakes. Generally, deposits in Marmora were of lower quality and met only Class "3" specifications (Ontario Ministry of Natural Resources, 1987).

Sand and gravel reserves were limited in Marmora and the material could be very bouldery in some areas, and very sandy in others. The 1975 report expressed that difficulties would be encountered in working the deposits on a large scale due to the variation and lack of continuity of the landforms (Proctor & Redfern Limited, Gartner Lee Associates Limited, 1975). The report indicates that the township had little more than local reserves of sand and gravels. Bedrock reserves, however, were immense (Proctor & Redfern Limited, Gartner Lee Associates Limited, 1975).

3.2.1.7. Rawdon

In 1987, there was still 8.18 million cubic metres of aggregate remaining within Rawdon. Twenty-two percent of the remaining aggregate met Class "1" specifications. Small esker ridges held the greatest reserves and were located throughout the township. The largest group of esker ridges was located within Concessions 8 to 12, Lots 10 to 24 (Ontario Ministry of Natural Resources, 1987). According to the 1975 report, potential development problems may arise due to low, poorly drained land which could inhibit the availability of the stone for large quarry development (Proctor & Redfern Limited, Gartner Lee Associates Limited, 1975). Sand and gravel reserves were small, and were likely suitable only for local use. In addition, the quality of these reserves was questionable for asphalt and concrete uses (Proctor & Redfern Limited, Gartner Lee Associates Limited, 1975).

3.2.1.8. Tyendinaga

Tyendinaga had 9.87 million cubic metres of available material in 1987. The Marlbank esker was the township's largest deposit but the material had severe quality problems limiting its possible uses. Seventy-nine percent of the township's available reserves met Class "2" material, although significant areas were unavailable for extraction. Higher quality material may be found with further testing (Ontario Ministry of Natural Resources, 1987).

According to the 1987 report, potential bedrock resources were immense close to the Salmon River. Reserves were estimated at 4784 million tons. However, sand and gravel resources were poor in the area. Possible reserves were useful mainly for local needs (Ontario Ministry of Natural Resources, 1987).

3.2.2. Northern Townships

3.2.2.1. Lake

According to the 1987 report, there were very few aggregate resources in Lake Township. The township is characterized by swamps and rock scour with bare rock (Ontario Ministry of Natural Resources, 1987).

3.2.2.2. Limerick

In 1987, there was an estimated 8.68 million cubic metres of material available within Limerick Township. However, 94% of the material was of lower quality and said to meet only Class "3b" specifications. With beneficiation¹, the quality of the deposits could be ameliorated to meet Class "1"

¹ Beneficiation: crushing and separating ore into valuable substances or waste by any of a variety of techniques

and “2” specifications. The largest reserve area was located in the northwestern portion of the township west of Egan Lake (Ontario Ministry of Natural Resources, 1987).

3.2.2.3. Tudor

In 1987, only 1.35 million cubic metres of aggregate were available in Tudor. The material was of lower quality and would meet only Class “3b” specifications because of excess fines. However, like in Limerick, some of the material could be ameliorated with beneficiation (Ontario Ministry of Natural Resources, 1987).

3.2.2.4. Cashel

In total, Cashel Township had approximately 4.28 million cubic metres of material in 1987 – much of which was of lower quality. At that time, a limited supply of coarse material was available, but the aggregate was too small in size to produce a good crushable product. Sand reserves, on the other hand, were clean and well graded, and would meet Class “1b” specifications. The only other notable deposit was located north of Mephisto Creek. Despite some sections which would meet Class “1” specifications, most of the material was of lesser quality. Other small deposits within Cashel could be utilized as fill (Ontario Ministry of Natural Resources, 1987).

3.2.2.5. Carlow

According to the study, there were 33.77 million cubic metres of sand and gravel available within Carlow of which over 80% would meet only Class “3” specifications. The largest reserve in the township could contribute 2.1 million cubic metres (6% of total sand and gravel reserves) of Class “1” aggregate. In some areas of the township, lower quality aggregate can be ameliorated through beneficiation (Ontario Ministry of Natural Resources, 1987).

3.2.2.6. Mayo

Within Mayo, there was an estimated 82.96 million cubic metres of sand and gravel available in 1987. However, 87% of the material would meet only Class “3b” specifications. The largest deposit was the outwash delta which had fine sections which limited the aggregate’s possible uses. The second largest reserve area was the glaciofluvial deposits which had an estimated 11.23 million cubic metres of Class “1” to Class “3” material available for extraction. Within the northwestern portion of the deposit was where the higher quality material was found (Ontario Ministry of Natural Resources, 1987).

3.2.2.7. Bangor

Available within Bangor were 8.29 million cubic metres of aggregate. The study estimated that 25.6% of the material would meet Class “1” specifications and could be found in large aggregate sources north of Belot Mountain on the Wicklow-Bangor border. These reserves had the greatest potential for extraction because they were high quality and were situated close to Highway 62 (Ontario Ministry of Natural Resources, 1987).

3.2.2.8. Wicklow

In 1987, there were 76.23 million cubic metres of aggregate available within Wicklow. The largest reserves were found north of Maynooth, around Blairs and Cardwell Lakes. Eskers in the area provided all of the Class “1” material but could also provide Class “2” material (Ontario Ministry of Natural Resources, 1987).

3.2.2.9. McClure

Within McClure, 77.25 million cubic metres of aggregate were available. The largest reserve area was the ice-marginal system around Lake St. Peter. Sixty-two percent of total available aggregate

was found within this system, including 8.17 million cubic metres of Class “1” material. The eskers south of Lake St. Peter contained 1.34 million cubic metres of Class “1a” material. Although Class “3a” material was available adjacent to the eskers, this material could be made into a higher class with processing (Ontario Ministry of Natural Resources, 1987).

3.2.2.10. Herschel

There was approximately 66.45 million cubic metres of aggregate available within Herschel at the time of the study. Ninety-one percent of the material fell into the fine aggregate or “b” classification. Crushable material would have to be imported into the township to satisfy large demands whereas demand for “b” category material could be easily satisfied within the township (Ontario Ministry of Natural Resources, 1987).

3.2.2.11. Monteagle

Monteagle had abundant reserves of aggregate available. In 1987, an estimated 95.04 million cubic metres of material remained. The outwash extending from Hickey Corners, south along Bird Creek could supply large quantities of material for use within the township due to its large reserves and close proximity to Highway 62. The glaciofluvial assemblage south of Maynooth also provided high quality material. According to the study, 45% of the material would meet Class “1” and “2” specifications. In 1987, much of this high quality reserve was underdeveloped while being in close proximity to Highway 62 making it the most important reserve area within the township (Ontario Ministry of Natural Resources, 1987).

3.2.2.12. Wollaston

Aggregate material available in Wollaston was of a lower quality as it would only meet Class “3” specifications. However, in some areas, Class “1” and Class “2” material could be obtained with processing. Remaining in 1987 was 7.82 million cubic metres of Class “3” material. The largest reserve could be found west of Lower Faraday Road within Concessions 12 and 13. The second largest reserve area was located along Faraday Creek, west of Coe Hill (Ontario Ministry of Natural Resources, 1987).

3.2.2.13. Dungannon

In 1987 there was approximately 40.33 million cubic metres of material available within Dungannon. Most of this material (93%) would meet only Class “3” specifications. The largest reserve areas, located on the Monteagle-Dungannon Township borders, were outwash deposits of which sections met Class “1b” specifications (Ontario Ministry of Natural Resources, 1987).

3.2.2.14. Faraday

Within the township of Faraday, 65.63 million cubic metres of material were available in 1987. The majority of the material was said to meet only Class “3” specifications, but at the time significant amounts of Class “1” material remained. Glaciofluvial deposits around Bancroft made up the largest aggregate reserve. Even though much of the economically extractable area had been built upon, approximately 30 million cubic metres of material was still available in 1987 (Ontario Ministry of Natural Resources, 1987).

3.3. Minerals and Aggregates in Hastings County in 2007

At present, the Hastings County Planning Department is involved in ongoing consultation with MNR and MNDR staff to achieve the following:

5. Identify what mineral/mining features are shown but are no longer viable operations (license is expired etc.);
6. Identify what mineral/mining features are shown but are no longer viable operations due to the close proximity to sensitive lands uses such as settlement areas;

7. Identify what mineral/mining features are NOT shown and should be due to the significant value/quantity of materials – or are currently undertaking licensing applications. The Planning Department would include deposits that may be only locally significant (local construction projects, sands for septic systems, etc.), but not deposits that may be non-commercial; and,
8. Sites of abandoned mines that represent a hazard to human health or safety.

POLICY OPTIONS

Minerals & Aggregates

Demand for local supply of sand and gravel is dependent on local construction activities. These demands fluctuate significantly with the business cycle and particularly with government spending on roadway and highway construction or re-construction. Deposits may go without industry interest for many years before being needed.

Identification-

Most all major deposits of sand and gravel that may be used for construction activities have been identified and reported by the Province. Bedrock deposits are less identifiable and assessment by private interests is relied upon.

Deposits that have been identified and have not been compromised for extraction by adjacent sensitive uses (residential) should be designated in the Plan for future extraction. Additional policies will apply in terms of land use compatibility and environmental impact. Policies shall establish two types of compatibility issues:

1. Sensitive land uses shall be directed to locations set back from identified deposits- 150 metres from sand or gravel operations and 300 meters from operations where screening, crushing or blasting may occur.
2. Amendments to the Plan to introduce new extractive operations shall be considered after assessing compatibility with sensitive lands uses within 5000 metres.

Recommendations from the report *Mineral Aggregate Resources Inventory of the County of Hastings: Southern Ontario* (Ontario Ministry of Natural Resources, 1987)

Elzevir, Huntingdon and Rawdon have all the highest quality material (Class “1”). These reserves should be either protected or allowed to be extracted to their maximum potential.

The townships of Carlow/ Mayo, Cashel, Dungannon, Faraday, Limerick and Hastings Highlands contain Class “1” material. The narrow, high quality ridges west of Bancroft are of specific importance. Since Bancroft probably represents the area with the largest demand, these ridges should be protected for future use.

Some high quality reserve areas (Class “1” and “2”) are adjacent to lakes and rivers. The extraction and/or protection of these deposits will depend on local planning regulations.

Mining Potential and Mines

Hastings County has a rich history of mining, having Ontario's first gold mine and any other firsts. Because of the wide geological diversity of the County, identifying specific locations where mining might occur is challenging. To protect areas for future mining activity, the most strategically effective policy would be to simply direct non-compatible development, notably residential consents, to non-rural areas. Some areas having mining potential can be identified in a generalized fashion based on past assay reporting. Therefore, the use of a sub-designation is recommended for such areas. It will serve to direct non-compatible development to other areas and safeguard the resource. In the event that Council considers other uses to be a priority with an area identified as having mining potential, the proponent should be requested to provide geologic sampling, as follows:

- to demonstrate that the potential for mining is low by way of assessing value of the samples
- sampling with the approach of contributing to the scientific understanding of the geology of the area
- sampling protocols should be set by the Ministry of Northern Development and Mines or the Ministry of Natural Resources and geo-analytical results deposited with the Province and the County of Hastings as public documents.

An amendment to the Plan is recommended to permit the start-up of a mine. An amendment will establish a formal public notification process and provide all agencies an avenue for good communications.

REFERENCES

Mines, Mining & Aggregates

Ontario Ministry of Natural Resources, Staff of the Eastern Region. 1987. *Mineral Aggregate Resources Inventory of the County of Hastings: Southern Ontario*. Ontario Geological Survey. pp.1-152.

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Internal reports from MNR

Land Information Ontario (LIO)