

Canadian Brownfields Case Study

Greenwich-Mohawk



Aerial view of site during remediation.

PROJECT SUMMARY

Impressive remediation efforts completed at the Greenwich-Mohawk Site in Brantford earned the city a nomination for a “Brownie Award”, which recognizes a dedication to the rehabilitation of brownfield sites across Canada¹. This massive 51 hectare site was previously home to a number of prominent manufacturing uses, including the production of agricultural implements and farming equipment². Following the closure of these industries, lands sat vacant and essentially abandoned until the city moved to acquire the three properties that comprise this brownfield area, in 2007. With a budget of over 42 million dollars, from a number of different stakeholders and levels of government, the city engaged in an ambitious clean-up effort to address contamination left behind by previous on-site uses³. Over a two-year period, almost 150,000 cubic metres of soil was excavated, with the majority of soil being treated on-site, and reused. As of 2019, the city has retained a consultant to work with the community and other stakeholders to develop a draft concept plan for the site, as well as the greater Mohawk Lake District⁴.

The City of Brantford was once considered to be an economic powerhouse of Canada. At one point in the early 1900's, the city boasted the third-largest rate of manufacturing exports, behind just Toronto and Montreal⁵. Brantford's initial success in manufacturing was in part attributed to its

prime location along both a busy rail corridor, and the Grand River, which served as major avenues for freight traffic. Come the late 1980's however, industry fled, as a result of a number of market forces including industrialization and a serious recession⁶.

QUICK FACTS

Location

Brantford, Ontario

Project type

Site remediation and future redevelopment

Site size

20.6 hectares (51 acres)

Land uses

Industrial and commercial

Keywords/special features

Remediation, rehabilitation, excavation, community

Website

<https://www.brantford.ca/en/business-and-development/brownfields.aspx>

Project Address

347 Greenwich Street, 22 and 66 Mohawk Street.

Brownfield Project Award(s)

2018 Brownie Award Finalist: Reinvest - Financing, Risk Management & Partnerships
2014 Brownie Award: Remediate - Sustainable Remediation and Technological Innovation

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Case studies were prepared as a course assignment by students enrolled in PLG845: Brownfield Reuse & Development, Cleaning up the Past and Building the Future, School of Urban and Regional Planning, Ryerson University (Winter 2019). Information for the case studies was obtained from online sources, available reports, and, in some cases, site visits and direct communication with stakeholders.

If you are aware of any errors or have updates to the case studies, please contact chris.desousa@ryerson.ca

The opinions expressed in this case study are those of the authors only and do not represent the opinions and views of either Ryerson University, the School of Urban and Regional Planning, or the Canadian Brownfields Network.



At 51 hectares in size, the Greenwich-Mohawk site is the largest brownfield area throughout the City of Brantford⁷. The site is comprised of three separate properties, namely 22 Mohawk Street, 66 Mohawk Street, and 347 Greenwich Street. These properties were each previously home to a number of industrial uses, with a particular focus on the manufacturing of industrial equipment⁸. The now-consolidated site is segmented by an east-west rail corridor which runs directly through the site, and the Grand River, which is located along the northern perimeter of the property. For contextual reference, the site is located just one kilometer from Brantford's downtown core.

Site Characteristics

347 Greenwich Street

In 1891, the company Alanson Harris and Son began manufacturing agricultural implements and farming equipment on this 27.9 acre site. Through a number of mergers, acquisitions, and subsequent expansion, the company was renamed Massey-Ferguson, and employed an impressive thousands of workers in the 1950's⁹. Come 1986, however, the once prominent manufacturing firm closed its doors, and manufacturing facilities were left essentially abandoned. After years of sitting idle, a fire in 2005 caused major damage to the majority of on-site structures. Following this destructive event, it was decided that all remaining on-site properties would be demolished, following the completion of a heritage analysis¹⁰.

66 Mohawk Street

In 1877, entrepreneur James G. Cockshutt opened a plant on the 15.75 acre site, which specialized in the manufacturing of innovative farming equipment, including tractors. Through a number of mergers and acquisitions, manufacturing operation grew greatly in size, and was Cockshutt Plow Company¹¹. This firm also played an important role during the Second World War, specializing in the production of wartime aircraft and vehicular equipment. Decades later, the company was eventually sold and renamed White Farm Equipment. On-site operations ceased to continue by 1985, as the company filed for bankruptcy¹². Of particular note, two office buildings on site lands were designated under the Ontario Heritage Act, in 2002. Both buildings were deemed to have value, as they displayed characteristics of nineteenth century industrial architecture¹³. Unfortunately, as a result of a massive fire in 2012, all that remained of these historical structures was their facades.



Source: City of Brantford

A sketch of the famous Adams Wagon Co. Plant, which was previously located at 22 Mohawk Street

22 Mohawk Street

At 7.25 acres in size, this site is the smallest of the three properties that comprise the Greenwich Mohawk Brownfield. This site was previously home to a number of different uses, ranging from the construction of military vehicles during the Second World War, to being most recently occupied by the Sternson Group, which manufactured construction supplies and provided water treatment services, until its closure in 1988¹⁴.

After decades of sitting empty, with hundreds of thousands of dollars owed in back-taxes, the City of Brantford moved to acquire these three properties in 2007¹⁵.

at various locations across the site. As a result of previous manufacturing uses, the existence of petroleum hydrocarbons, xylenes and lead impacts to soil were discovered¹⁶. In addition, abandoned underground storage tanks were also uncovered during the assessment process.

Cleanup efforts required the excavation of a total of 148,900 cubic meters of soil. An impressive 73% of contaminated soil received on-site treatment, and was ultimately reused¹⁷. Conversely, 27% of soil was deemed to be unusable, and was disposed of at an off-site location¹⁸. In order to treat identified contaminated soil, a number of innovative techniques were used including:

Bio-piling played an important role in the on-site remediation of contaminated soil. As part of this bioremediation technique, contaminated soils were excavated, and stored in a sealed enclosure, at ground level¹⁹. The purpose of this action was to

Contaminants and Cleanup Efforts

Phase 1 and 2 Environmental Site Assessments, conducted in 2013, revealed the presence of a number of contaminated materials



Source: Durham Region

A close-up look at Greenwich-Mohawk cleanup efforts.

ensure that contaminants did not spread to other areas with non-contaminated soil. Pipes running adjacent to the enclosure provided both nutrients and a controlled flow of air to contaminated soil. Regular sampling indicated a progressive decline in ambient levels of contaminants, following treatment.

The process of **screening and washing** also played a key part in the bioremediation process at the Greenwich- Mohawk site. As part of this remediation method, on-site machinery, aided in dissolving and suspending contaminants within soil. It is important to note that this process simply separates contaminants, rather than reducing or eliminating them²⁰. As such, separated contaminants were separated and stored, followed by off-site disposal.

Design Interventions

Design interventions also proved to be important, as part of remediation efforts. Two on-site concrete barrier walls were installed, along the existing east-west rail corridor. These concrete walls span a vast 180 metres in length, and stand 6 metres in height²¹. The purpose of these physical interventions is to protect against the potential future migration of off-site contaminants from entering the newly remediated site. Furthermore, an underground polyethylene lined barrier was installed along the southern portion of the property line at what was previously 66 Mohawk Street²². The function of this barrier is to protect an existing self-contained groundwater trench from exposure to potential contaminants. Lastly, a \$330,000 Waterloo Barrier was installed along a portion of the property that

was previously known as 347 Greenwich Street²³. This triangle-shaped metal barrier served as a substitute to the potentially costly and odorous removal of contaminants that were unexpectedly found in proximity to an abandoned underground tank.

Remediation efforts proved difficult at times, in that the clean-up work produced temporary negative externalities that were of concern to the community. Specifically, residents in close proximity to the site expressed concern about the odour attached to soil remediation efforts. In fact, over a two-day period in November of 2015, the city received 55 complaints relating to the smell produced from buried oil exposure to air²⁴. As a result, soil remediation efforts were temporarily put on hold for a total of three times, during the fall of 2015²⁵. Odours produced from this type of remediation are perceived as being especially intolerable during times of high temperatures, high levels of humidity, and low levels of wind. As a result, remediation work was temporarily put-off until conditions were more favourable, wherein odours produced would be less severe. Complaints of odour were not the only concerns expressed by local residents; the city also received objections relating to noise, dust and pollution stemming from remediation efforts²⁶.

Financing

Costs associated with the remediation of the Greenwich-Mohawk site were funded through a number of different sources and partners. The city was able to acquire a grant valued at \$512,520 from the Green Municipal Fund, which was allocated towards the cost of conducting both a phase one and two environmental site assessment²⁷. The Green Municipal Fund provided further financial aid with a \$23,500,000 loan, which was used as part of soil remediation efforts²⁸. Upper levels of government also played a key role in financing site remediation efforts. In 2007, the Provincial Government committed five million dollars in funding, which was used throughout each stage of the remediation process. In addition, the Federal Government provided 12 million dollars in funding just one year later in 2008, towards remediation efforts²⁹. Brantford's City Council also allocated a total of \$1,875,702 towards all stages of the remediation process³⁰.

Project Status

As of 2019, all remediation work has been completed, with site contamination levels restored to below stipulated criteria levels. The

The city is currently in the midst of working on a draft concept plan for the Mohawk Lake District, of which the Greenwich-Mohawk comprises a significant area. While there are no finalized plans, consultations with the public as well as charrette work have indicated that there is a desire for additional commercial uses in this area³¹.

Key Challenges

Conditions attached to the grants provided by both the Provincial and Federal Governments proved to be challenging throughout the remediation process. A stipulation required that remediation work needed to be completed by a certain date, in order for the city to qualify for funding. Specifically, remediation work was required to be finished by 2016, or else funding in the form of these grants would not be available to the city. This proved to be difficult, as a result of a number of unforeseen complications that arose during parts of the project. First off, upon commencement of remediation work, it was determined that levels of contaminated soil were higher than previously anticipated. In fact, the city was required to remediate 35,740 cubic metres, or 24 percent, more soil than it first estimated³².

Another key challenge to the remediation of this site is the sheer size of the brownfield area. At 52 hectares in total size, this site is the equivalency of 20 full-size football fields. With greater size comes an increased presence of contamination, and a subsequent larger price tag attached to remediation efforts. With an original cost estimate of remediation efforts being pegged at a whopping \$210,000,000, many feared this site to be irredeemable³³. Through a number of innovative treatment techniques, and support from upper-levels of government, contamination levels were restored to below ambient –level criteria, as provided by the Ministry of Environment Conservation and Parks. In fact, remediation costs actually came in below budget by approximately two million dollars, at 40.8 million dollars³⁴.

Lessons Learned

A New Beginning - The 15 worst brownfield sites within the City of Brantford span a total of 88 acres, in cumulative size³⁵. At 52 hectares in size, the Greenwich-Mohawk is comprised of more area than the fourteen other worst sites, combined! Having sat empty and abandoned for decades, this colossal site has only served as a reminder of Brantford's heavily diminished industrial presence. The successful remediation of a site of this magnitude and complexity exemplifies the



Source: Tara Tian, City of Brantford

An installation of an on-site concrete barrier, to prevent against the potential future migration of off-site contaminants.

resilience of the city, and puts an end to the eyesore that was this massive, underutilized site. The new-found viability of creating a mixed-use community will provide good-paying jobs and an improved quality of life to residents and visitors alike. Just as this site was once a hub of productivity, during the city's industrial prime, the area can once again become a cherished place of activity.

The Role of a Champion - This project has perhaps seen no greater ally than former City Councillor Marguerite Ceschi-Smith, who previously represented the ward that is home to the Greenwich-Mohawk Site. Ceschi-Smith's relentless advocacy was instrumental in getting upper levels of government to commit to funding this massive remediation project. Specifically, the former City Councillor convinced then Prime Minister Paul Martin that the Federal Government had a responsibility to share some of the costs associated with project cleanup, considering several of the now-closed on-site factories "put Canada on the map", when it came to the manufacturing of agricultural equipment. Further, fellow Councilor Richard Carpenter recalls a time when Ceschi-Smith refused to let go of the then Minister of the Environment's arm, during a visit at Queen's Park, until he had committed to funding for Brownfield site remediation³⁶.



Future vision for a Master Plan on site lands.

Source: Brown and Storey Architects

Endnotes

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30 *Ibid.*

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