

APPENDIX 1.2

R e h a b i l i t a t i n g C o n t a m i n a t e d S o i l



Highlights

- Rehabilitation of contaminated soil is part of the process of redeveloping industrial urban brownfields. It is generally undertaken for specific real-estate or urban development projects.
- Soil rehabilitation may be undertaken in response to pressure applied by local residents and governments, to improve the quality of housing and the urban environment. Most often it is due to pressure for property development on these huge sites, generally located in central areas.
- Rehabilitation costs are most often shared by the owner, the developer and governments.

General description of rehabilitation projects (objectives)

The urban landscape of large communities has gradually been transformed over the past 30 years. Businesses that require large expanses of land (manufacturers, factories, warehouses, railway yards, land-fills, etc.) have left downtown for different reasons (drop-off in operations or relocation to more appropriate locations or more competitive countries), leaving vast industrial brownfields (Dumesnil and Ouellet, 2002). These brownfield consists of vacant or built sites, abandoned or underused, mainly located on the periphery of downtown, waterfronts or harbours (Ontario Ministry of Municipal Affairs and Housing, 2000). They are the remains of an often very important phase in urban industrialization, which led to a massive wave of urbanization in the early 20th century and even earlier in many western cities.

Many of these spaces are encumbered by traces of their former uses. Now that cities are fully urbanized, vacant land has become increasing hard to find. The soil and water table of these industrial brownfields are contaminated by chemicals, solids or organic waste. In the United States, it is estimated that there are from 450,00 to 600,000 sites of this kind, while in France there are close to 250,000. No comprehensive data have been compiled on this subject for Canada (Dumesnil and Ouellet, 2002).

There are many reasons for redeveloping these brownfield sites, including economic development (job creation, boosting tax revenues, etc.), improving water, soil and air quality, reducing urban sprawl, making more effective use of existing infrastructure, facilities and services and, finally, renewing neighbourhoods and communities (OMMAH, 2000).

Soil rehabilitation methods

In Quebec, government legislation establishes three levels of contamination (generic criteria) for soils, i.e. criteria A, B and C. The purpose of these categories is to determine parameters for the types of authorized uses on contaminated sites or those to be remediated.

- *Class A* soils are considered healthy and fit for all uses (residential, commercial and industrial).
- *Class B* soils contain low levels of organic or inorganic contaminants and are reserved for commercial or industrial uses (developers must decontaminate *Class B* soils and upgrade them to *Class A* before they can be used for housing).
- *Class C* soils contain more-toxic contaminants. In such situations, a landowner wishing to develop a project involving changes in the use of the soil must (usually) excavate the soil that exceeds the applicable generic criterion and send it to one of the landfill sites in Quebec authorized by the Department of the Environment. This often expensive method can discourage many developers. It may make it quite difficult to redevelop such contaminated brownfield land, which otherwise could represent great development potential.

For a number of years, this method based on generic criteria A, B and C has been complemented by another, more flexible method. This additional evaluation technique makes it possible to reduce costs considerably, while ensuring that the contaminants in the soil do not harm human health or the environment. This method is known as *risk analysis*. It encourages on-site management of contaminated soil, using techniques to confine and control the contaminants present, and means to be adapted to the nature of problems and the planned redevelopment. The analysis consists mainly of assessing the risk, and determining whether it can be mitigated or controlled. Mitigation and control methods may involve covering the soil with a geotextile and one metre of healthy soil, for instance, or of sealing the contaminated soil under structures or paved parking lots (Francoeur, 1997).

This method raises a number of questions, however: the reliability of analyses of the toxicity and migration of products and gases, health risks, and long-term effectiveness of mitigation measures. In response, the Quebec Department of the Environment decided to combine the two techniques. While maintaining the A, B and C generic criteria methodology, developers can seek approval for rehabilitation using risk analysis techniques (a detailed study and rehabilitation plan are required) for a specific property and, if necessary, agree to monitor the effectiveness of the measures implemented (Francoeur, 1997). The land rehabilitated (and the mitigation measures implemented) must be recorded in the *Registre des droits reels*, to inform future owners of restrictions applicable to the site, and to prevent municipalities from issuing permits for any uses other than those authorized by the Department.

Procedure

Launching the project

Successful soil rehabilitation depends on the willingness of all stakeholders to make the rehabilitation of industrial brownfields part of a planning and urban redevelopment process or part of a specific development project. The size of such lands and their location in central areas with great development potential have made them attractive to developers, given the scarcity of available land. The next step is negotiating with the landowner, the developer, the government and the municipality (with their soil rehabilitation support program). Discussions concern the relationship between the project and the nature of the contaminants (how clean is clean), plausible solutions and the financial responsibilities of each party. In some cases, the landowner becomes a developer when it sees an opportunity to redevelop its site for a very different use (e.g. Canadian Pacific and the Angus Shops, in Montréal).

Financing soil rehabilitation

Canada, like most other countries, tries to apply the *polluter pays* principle. Accordingly, major costs related to soil rehabilitation should be covered by former landowners. But if there is no public financing, it is highly unlikely that such brownfields can be rehabilitated and redeveloped, given the financial risks and the high development costs that invariably have an impact on future buyers. In Quebec, the ministère de l'Environnement's *Revi-Sols* program acted as a very powerful incentive for development (\$60 million for the Montréal region from 1988 to 2003). The program makes it possible to subsidize 50% of the total cost and even up to 70%, in projects using advanced soil rehabilitation technology (ministère de l'Environnement, 2004).

Choosing a project

When it comes to rehabilitation of contaminated sites, no projects are automatically considered more viable than others. Industrial or commercial projects will receive priority inasmuch as the goal is to reduce costs associated with decontamination. The profitability of investment in an industrial project, however, for both the developer and the municipality (tax revenues) will be much lower than in the case of a residential project. All stakeholders should consider the problem from the perspective of a major development. Repurposing industrial brownfields calls for many different players, often with not solely monetary interests, to work on projects that fit into the surroundings. In the LaSalle borough, for instance, a daycare centre was created, whereas elsewhere new residential developments and shopping malls were built, some zones were returned to nature for recreational purposes, and parks and even forests were created. Moreover, these projects can help reconnect neighbourhoods that have been cut in half, recreate links or, to the contrary, constitute buffer zones between areas with different (residential vs. industrial) uses (Sénécal and St-Laurent (1999), quoted in Dumesnil and Ouellet, 2002).

Expected project benefits results

Case studies show that the success of projects depends greatly on collaboration among governments, the private sector and local residents. In some instances public authorities had to release the new owners from financial liability and assume financial responsibility for site rehabilitation before the project could go ahead.

In Switzerland, the Federal Office for Spatial Development identified ten key elements to be considered for successful rehabilitation projects (Dumesnil and Ouellet, 2002):

- Make sure the primary objective is land development;
- Ensure that the site is strategically (competitively) located— this assumes close collaboration between the business community and the public sector;
- Obtain the commitment of local residents;
- Encourage landowners to discuss their main interests at a round table;
- Integrate the project into existing urban infrastructure (development plan);
- Develop a promotional strategy (commitment by public authorities) to attract investors;
- Make use of the site from the outset, through temporary occupation (by leasing the spaces until they are sold) to prevent the site from being abandoned;
- Identify contaminants and evaluate decontamination costs;
- Limit red tape;
- Adapt to investors' deadlines.

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Angus Project

Rosemont/Petite-Patrie, Montréal

Area:	872,088 m ² , phases 1 and 2
Completion:	Phase 2: 1998-2007
Total cost:	Phase 2: \$486 million
Design:	Phase 2: Antoine Chaloub, Aedifica, Dupuis & Dubuc
Development:	Canadian Pacific Railway (CP), Société des terrains Angus (SOTAN), Société de développement Angus (SDA), private sector
Soil management:	Canadian Pacific Railway (CP), for the residential sector, and SDA, for the industrial and commercial sector

Phase I, 1983-1994

In the 1970s, CP closed part of its shops, east of Saint-Michel Boulevard, and transferred ownership of 50 ha of unused land (the eastern part of the site) to a subsidiary, Marathon Realty. In 1976, the new owner announced that the site would be used for the largest shopping centre in Eastern Canada, and a 1,500-unit housing complex. Merchants and community organizations in Rosemont/Petite-Patrie immediately objected to this project, claiming that it would cause huge traffic problems and compete unfairly with local businesses. Community pressure on CP and City Hall between 1977 and 1982 finally led to this part of the site being sold to a paramunicipal corporation, the Société des terrains Angus (SOTAN), which completely redefined the project and shifted its focus to a mixed residential function, combining private, low-income and co-operative housing.

During this first development phase, from 1983 to 1994, SOTAN created 2,587 new dwellings, of which 40% were reserved for housing co-operatives, non-profit housing organizations and the public sector. For SOTAN, which assumed responsibility for soil management, reaching this proportion of low-income housing was simplified by the fact that environmental standards at the time were less stringent than they are today.

Context

The immense Angus site (872,088 m²), initially bounded by Saint-Joseph Blvd., Bourbonnière Ave., Rachel St. and Iberville St., was once home to Canadian Pacific Railway's largest rolling stock manufacturing and maintenance shops. In its heyday, during the Second World War, the complex had 31 main buildings and 35 annexes (repair shops, foundry, hospital, fire station, etc.) and 12,000 employees.

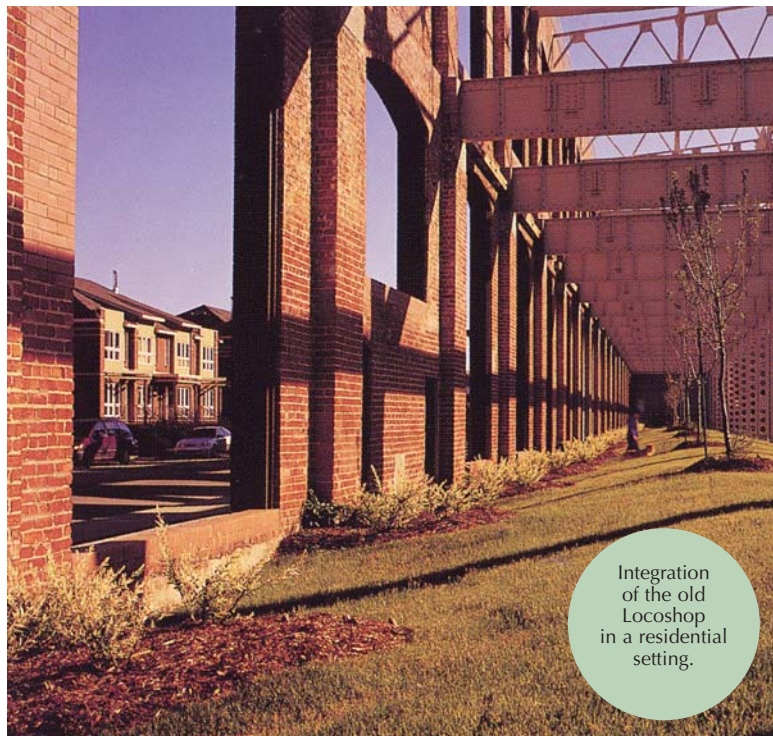
From 1950 to 1975, however, growth in trade with the United States, the conversion of locomotives from steam to diesel, the decline in trade with Europe, the opening of the St. Lawrence Seaway and the rapid development of trucking, to the detriment of the railways, led to extensive restructuring in transportation. Over this period, Montréal's role as a hub and obligatory transshipment point for Canadian freight declined considerably, with a direct impact on the Angus shops: from 7,000 in 1950, the number of employees dropped to 1,000 by 1980.

Between 1975 and 1992, the shops were gradually shut down, and CP recovered vast expanses of land, which was then developed over more than two decades (expected completion in 2007), in two major phases.

Aerial view of the Angus shops in 1998.



Canadian Pacific Railways Real Estate Group



Integration of the old Locoshop in a residential setting.

Canadian Pacific Railways Real Estate Group



Townhouses on William Tremblay Street.

Canadian Pacific Railways Real Estate Group

Phase II, 1998-2007

Early in 1992, CP closed the Angus Shops and asked the City of Montréal to adapt its urban plan, then being prepared, to allow the redevelopment of the vast tracts of land and the reuse of certain buildings, after a site plan had been submitted. CP subsequently submitted such a plan. After intense negotiations with the Corporation de développement économique de Rosemont/Petite-Patrie (created in 1998 in response to declining employment in the community), which had fiercely opposed any use of the site for anything other than industry, CP managed to convince the municipal administration to approve a project allowing mixed zoning (40% residential, 40% industrial, 20% commercial). The Société de développement Angus (SDA) acquires the land it needs from CP as the development proceeds, and has recently acquired the strip of land between Molson Street and the CP tracks. Work began in 1998, after the urban plan was adopted, the site plan was approved and the development program ensuring co-ordinated development of phase 2 came into effect.

Project description

The redevelopment plan drawn up by CP for the site as a whole called for the construction of 1,200 housing units of different kinds, the creation of nine green spaces and a linear park, the introduction of stores and businesses and the development of a light industrial sector.

The development of the industrial sector was handed over to the SDA, based on a governance structure established in response to community pressure, and was made part of the Angus Technopole project. The project is intended to create 2,000 jobs (by 2008) through the creation of a series of small and medium-sized businesses, primarily in the environment and high-tech sectors. The two main poles, residential and industrial, are located on either side of a large urban park, with a commercial core nearby.

To date, 500 units have been built, 7 parks created and close to 20 businesses have taken up residence in the Angus Technopole. Half of the businesses are located in the west wing of the former Locoshop, a 10,000 m² heritage building converted so as to preserve and highlight its industrial character. A parking lot separates the industrial mall from the eastern section of the former shop, which now houses a Loblaws supermarket. Finally, two other heritage buildings, the former fire station and the old CP head office, were also recycled and today house a Société des alcools du Québec outlet and offices.



Aerial view of the Angus project in fall 2003.

Pierre Malo image bank

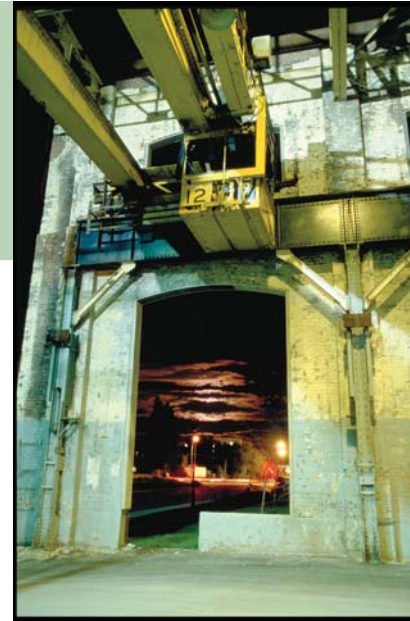
Rehabilitating Contaminated Soil

Case study

Implementation

During the first phase of the Angus project, the environmental requirements concerning contaminated soil were less stringent than in the early 1990s. In 1992, the legal and commercial context obliged CP to ensure that all the land intended for development met the environmental criteria established by the Quebec's ministère de l'Environnement (MEQ). Detailed characterization of the soil found that the land to be developed contained over 40,000 m² of soil contaminated by 90 different substances (metals and organic compounds) and that complying with environmental requirements using traditional methods would have cost tens of millions of dollars. To find an economically viable solution for all the partners involved in the redevelopment project, negotiations were held between CP and the MEQ to come up with a different soil management strategy, one that would respect environmental standards while considerably reducing decontamination costs.

Architectural details of the industrial complex.



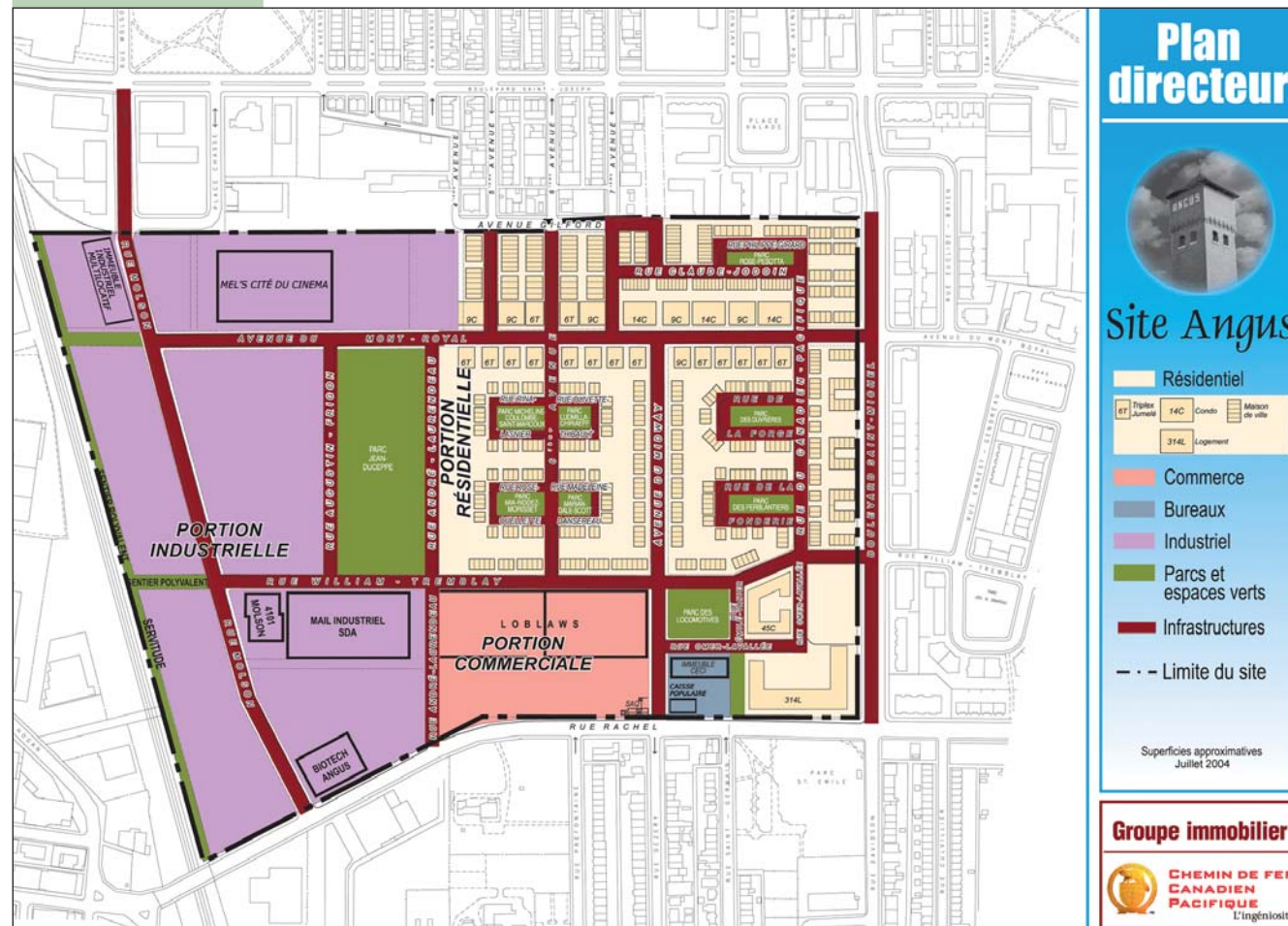
Pierre Malo image bank



Overview of the industrial complex, formerly part of the Locoshop.

Pierre Malo image bank

Master plan of the Angus site.



Ferblantiers park, created in 2000.

Pierre Malo image bank

CP, as prime contractor for the project, also had to handle the creation of the first parks and oversee the development of the residential and commercial sectors. In addition, the company collaborated with the city to co-ordinate the building of infrastructure. Meanwhile, the SDA was busy developing the Angus Technopole, by offering businesses premises and different support services (workforce recruitment and training, assistance in finding financing, support for environmental management, help with exports, etc.). The work was based on a development plan for the industrial sector drawn up by the SDA in 1997.

Follow-up

Out of the \$500 million to be invested, close to \$400 million in private investment has already been injected in phase II of the Angus project. To date the project has brought the City of Montréal upwards of \$2 million in property taxes. The investment can be broken down as follows:

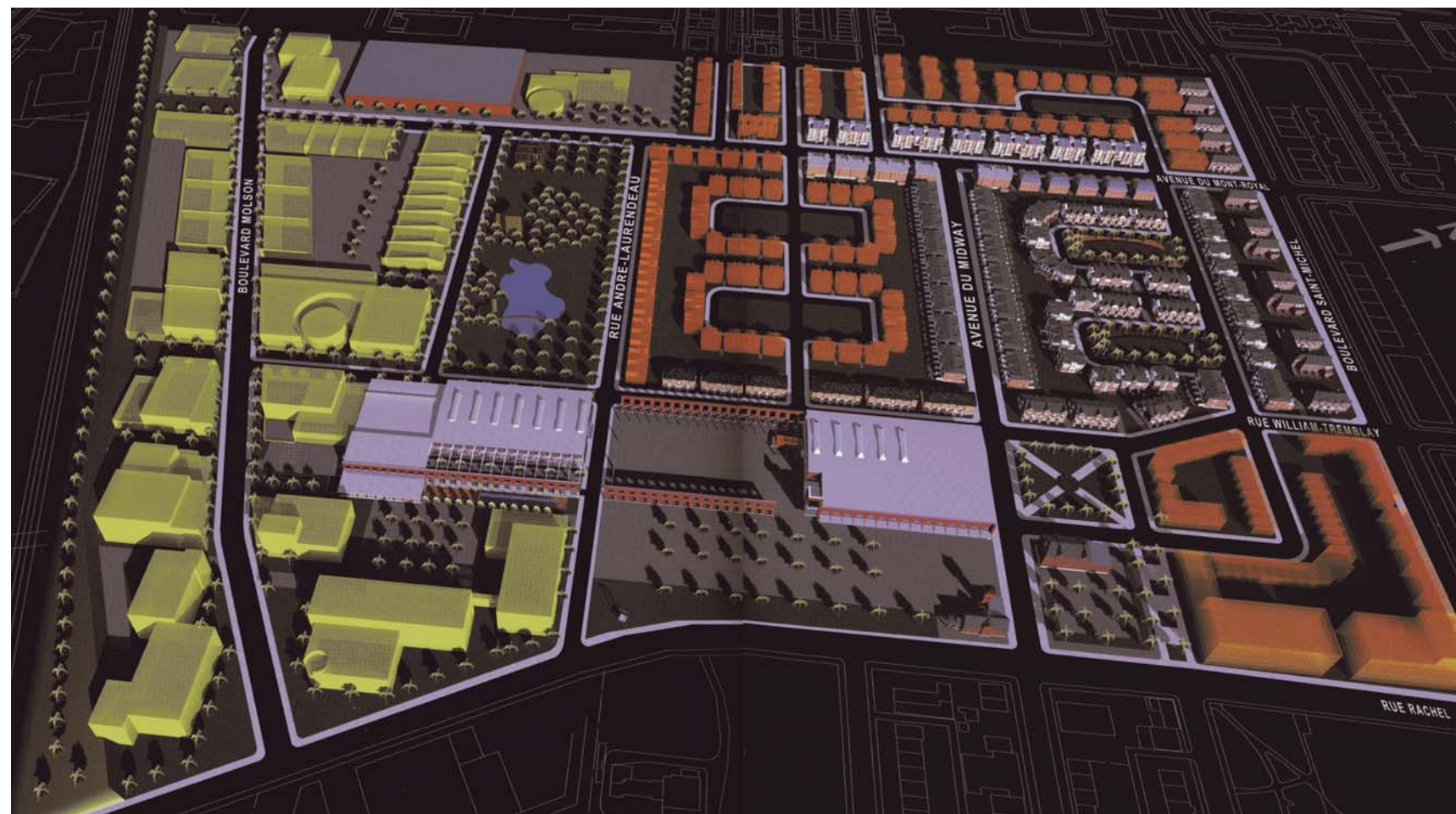
- \$204 million: residential construction
- \$20 million: development of the supermarket
- \$25 million: construction of an industrial centre and a biotechnology centre
- \$5 million: SAQ distribution centre on Molson Street
- \$12 million: site decontamination (including \$3.36 million paid by the *Revi-Sols* program)

The Angus Technopole expects that by 2008 the addition of new industrial and commercial buildings should allow the project to pass the 2,000 mark in terms of job creation. There are now 400 jobs at the Angus Technopole. In addition, the new residential development planned along Saint-Michel Boulevard will make it possible to bring in 1,500 new residents.

The Moliflex-White property, north of the site near Saint-Joseph Blvd., is not part of Phase II, and was purchased by Mel's Cité du cinéma and Location Michel Trudel in 2003.

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Overview of the Angus project.

Canadian Pacific Railways Real Estate Group and Aedifica, architects

