



SNC • LAVALIN

FINAL SUMMARY

Project Description pursuant to the *Canadian Environmental Assessment Act (CEAA 2012)*

Construction of Fertilizer Plant in Bécancour, Québec

IFFCO CANADA



ENVIRONMENT

December 2012

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Project n° 611020



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BACKGROUND

This **Project Description**, prepared pursuant to the *Canadian Environmental Assessment Act (CEAA 2012)*, concerns the construction of a urea production plant in the Bécancour industrial park.

It has been drafted in accordance with the Prescribed Information for the Description of a Designated Project Regulations (July 2012) and the Guide to Preparing a Description of a Designated Project Under the Canadian Environmental Assessment Act (July 2012), made available to project proponents by the Canadian Environmental Assessment Agency.

While the description reflects currently available technical information, it should be noted that the preliminary engineering and the social and environmental impact assessment for the project have not yet been done. It provides an overview of the general characteristics of the project and its environment and should therefore enable a better understanding of the main impacts the project is expected to have components that are within federal jurisdiction, including:

- fish and fish habitat;
- other aquatic species;
- migratory birds;
- federal lands;
- effects that cross provincial or international boundaries;
- effects that impact on Aboriginal peoples, such as their use of lands and resources for traditional purposes;
- changes to the environment that are directly linked to or necessarily incidental to any federal decisions about a project.

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1 GENERAL INFORMATION AND CONTACTS

IFFCO Canadas project, entitled *Construction of a Fertilizer Production Plant* consists in the construction and the operation of a plant to make urea from natural gas, the most widely used raw material for producing commercial nitrogen fertilizers. The project site is in the Bécancour Waterfront Industrial Park.

The project proponent is IFFCO Canada Enterprise Limited. (hereinafter “IFFCO Canada”). IFFCO Canada was registered in Montreal in July 2012. To carry out the project, a joint venture has been established between Kisan International Trading FZE (KIT), of Dubai, and Pacific Gateway Energy Ltd., of Calgary.

KIT, the majority shareholder, is a wholly owned subsidiary of parent company Indian Farmers Fertiliser Cooperative Limited (IFFCO), a cooperative involved in the production, importing, exporting, shipping and logistics of various fertilizers and the raw materials used to produce them.

An agreement in principle has been reached with Investissement Québec, and confirmed by Decree 829-2012 (August 1, 2012), regarding financial participation in the project. A second agreement in principle, with La Coop fédérée, made public on October 9, 2012, confirms the desire of all parties to establish a partnership. The Coop has committed to the distribution of 500,000 tons of urea through its network, which covers Quebec and the north east of Canada and the United States.

Contact information for the project proponent and the consultant are given in tables 1 and 2.

Table 1 Contact information of project proponent

Name:	IFFCO Canada Enterprise Limited
Civic address:	600 De Maisonneuve Boulevard West, Suite 2200, Montreal, Quebec, Canada H3A 3J2
Project manager:	Mr. Birinder Singh
Telephone:	+ 91 98 18 38 51 61
E-mail:	bsingh@iffcocan.com

Table 2 Contact information of consultant mandated by project proponent

Name:	SNC-Lavalin Environment, Division of SNC-Lavalin Inc.
Civic address:	550 Sherbrooke Street West, 1st floor Montreal, Quebec, Canada H3A 1B9
Project manager:	Lina Lachapelle, Project Director
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Fax:	514-392-4785
E-mail:	lina.lachapelle@snclavalin.com

The planned project to build a urea plant with an annual production capacity of over 1.3 million tonnes of urea is subject to the environmental impact assessment and review procedure, as provided in the *Regulation respecting environmental impact assessment and review*. Once the government decree has been issued, IFFCO Canada will be able to apply for the various permits and certificates of authorization required to carry out the project. Certificates of authorization will be required, under section 22 of the EQA, for the preparation and development of the site, installation of the equipment and operation of the plant, and under sections 48 and 32 for the atmospheric emission and liquid effluent treatment equipment. Obtaining the certificates of authorization from the MDDEFP is conditional on obtaining a certificate of compliance with municipal by-laws.

According to information provided by the Canadian Environmental Assessment Agency (CEAA), no regional environmental studies have been conducted in the study area in Quebec under the Canadian Environmental Protection Act (CEPA).

2 PROJECT INFORMATION

2.1 PROJECT OBJECTIVE AND RATIONALE

The objective of the project is to build and operate a fertilizer — more specifically, urea — production plant having a capacity of 3,850 metric tons (MT) per day in the Bécancour Waterfront Industrial Park in Quebec. Carrying out the project will require investment in the order of \$1.2 billion.

The planned plant primarily targets urea production and will in priority serve Quebec, Eastern Canada and Northeastern United States markets. Canada is both a urea producer and importer. Production centers are based in the western part of the country. On the other hand, Quebec must fill 100 % of its needs by imports. In 2010 and 2011, more than 400 000 tons of urea were imported each year, mainly from the Middle East and Northern Europe. Partner of the project, the Coop fédérée has committed in distributing 500 000 tons per year of urea produced by the plant in its network. Urea production in Quebec will therefore meet a need while ensuring the

supply for agricultural producers in Quebec and in Eastern Canada. It will also allow Quebec to position itself advantageously in the Northeastern U.S. market and to make itself a place on the global market, as a part of the production will also serve international markets, particularly India.

Commercial fertilizer production is crucial to ensure the security of the world's food supply. Population growth, coupled with the limited availability of arable land, is putting pressure on agricultural producers to maximize their crop yields. The use of fertilizers is a recognized way to increase the yield of agricultural land. According to the Canadian Fertilizer Institute, an estimated 40% of yield increases achieved by Canadian farmers are a direct result of commercial fertilizers. Demand for food grains is expected to rise sharply over the next few years, which means fertilizer production will have to rise accordingly.

In addition to use as fertilizer, representing nearly 90% of the urea consumed in the world, urea enters in the manufacture of multiple products, including synthetic resins based on urea formaldehyde for industry wood, melamine, some pharmaceuticals and cosmetics, for textile pigment and the manufacture of feed for ruminants (urea being a nitrogen source and therefore a nutritional additive).

In liquid form, urea is also an ingredient in the composition of DEF (Diesel Exhaust Fluid) used in the catalytic converter systems of diesel-powered vehicles. DEF is a mixture composed of 32.5% urea and 67.5 % purified water. Adding DEF to diesel engine exhaust facilitates the breakdown of nitrogen oxides (NO_x) into hydrogen and water through catalytic reduction (SCR-Selective Catalytic Reduction). As a result of current legislation in both Canada and the United States (*On-Road Vehicle and Engine Emission Regulations*, in Canada, and the Environmental Protection Agency (EPA) Emissions Standards, 2010, in the USA) as well as in Europe respecting pollutant emissions from highway vehicles, the DEF market is booming. The IFFCO Canada project intends to produce and distribute DEF as a secondary product.

Producing fertilizer requires a major source of energy and carbon, which in many countries is gas extracted from coal. The project being proposed in Quebec will produce urea through the conversion and use of a much less-polluting resource, which is natural gas. Besides having well-developed infrastructure for the distribution of various types of energy, Canada ranks third in the world as a natural gas producer and is regarded as a strategic location for a urea plant. Quebec's natural gas distribution network is supplied from western Canadian markets as well as from markets in the eastern and central United States. In addition, Quebec offers the advantage of a reliable electrical power generation and distribution system.

By choosing a site in the Bécancour Waterfront Industrial Park, which is served by a deep-water port and well-developed road and rail systems, IFFCO Canada will benefit from the advantages of an excellent transportation network, which will facilitate distribution of its product on both local and international markets.

2.2 APPLICATION OF REGULATIONS DESIGNATING PHYSICAL ACTIVITIES

Under the new *Canadian Environmental Assessment Act* (CEAA 2012) and the *Regulation Designating Physical Activities*, the construction and operation of a facility for the manufacture of chemical products with a production capacity of 250,000 t/yr or more (article 20, paragraph d) may be subject to the environmental assessment process.

Under the new CEAA, a project proponent may proceed with a “designated project” only if the Canadian Environmental Assessment Agency (CEAA) decides that an environmental assessment is not required or if, in the event that an environmental assessment is required, the proponent has fulfilled all the conditions set out in the CEAA’s decision.

2.3 COMPONENTS AND ACTIVITIES

2.3.1 Physical Works Associated with Project

The project involves the construction and operation of a fertilizer production plant consisting of two process units, one for ammonia and the other for urea, in the Bécancour industrial park.

Manufacturing urea from natural gas requires the installation of a variety of infrastructure and major equipment:

- Ammonia unit;
- Urea unit;
- Two 10,000-metric-ton ammonia storage tanks and two 75,000-metric-ton urea silos;
- Inert gas (nitrogen) storage and generation facility, and a compressed air facility;
- Emergency diesel generator and a transformer;
- Switch yard for importing power;
- Raw water treatment, demineralization and conditioning installations;
- Water treatment facility for plant effluents;
- Conveyor system (over distance of 5.8 to 6.8 km) and installations for bulk loading onto ships;
- Compressor House for air compressor, synthesis gases, ammonia refrigeration and CO₂ Compressors;
- Natural gas supply terminal;
- Buildings for various operating functions (Central Control Room, maintenance shop, warehouse, laboratory, cafeteria, fire station, nursing station and administration);
- Sidings for the loading and shipping of urea by railcar, truck and ship.

Most of the infrastructure will be located on the eastern part of the project site.

The raw water required for cooling, for the boiler and for operational processes, will come from the *Société du Parc Industriel et Portuaire de Bécancour* (SPIPB) pumping station. Drinking water is supplied by the City of Bécancour.

Natural gas will be used as the main raw material in the manufacturing process and as a source of fuel for the boiler. The gas will be distributed through the Gaz Métro network. It is estimated that 2.1 to 2.5 million standard cubic metres will be used per day.

2.3.2 Production Capacity and Processes

The project will entail manufacturing 2,200 MT of ammonia per day and 3,850 MT of granular urea per day. All the ammonia produced will be used in making urea. The mean annual production capacity will vary between 1.1 and 1.3 million tonnes of granular urea and may produce up to 635 000 tonnes per year of liquid urea (DEF).

The urea will be produced using known, proven technology; urea has been commercially manufactured for more than a century. The process involves a reaction between hydrogen and nitrogen, at high temperature and pressure, with catalysts. Production of granular urea is a two-stage process:

1) Production of anhydrous ammonia:

Methane, the main constituent of natural gas, is converted into hydrogen when it reacts with steam at high temperature. The carbon monoxide produced in the first stage mixes with water to form carbon dioxide, that will be entirely consumed in the urea production unit. The resulting hydrogen then mixes with nitrogen (present in the air) to form ammonia. The gas is then cooled, and the ammonia changes to a liquid state.

2) Production of urea:

The liquid ammonia reacts with carbon dioxide at high temperature and pressure to form urea. The impurities are then extracted from the mixture in a distillation tower. The main impurities are water and unconsumed reagents (ammonia and carbon dioxide). They are recycled back to process. The urea solution and an anti-caking agent are fed into a granulation chamber in which there is a counter-current flow of fluidized air. The pulverized suspension becomes granulated in the flow of air. The urea particles are cooled as they move sideways across the chamber. This extracts all the humidity and the urea particles turn into granules, which are then transported by a conveyor system to a storage site.

Production of liquid urea (DEF) is done before the granulation step, by mixing the urea solution with water to obtain a 32.5% urea and water mixture.

The final product, solid granular urea, will be transferred to the port by a conveyor system (to be loaded onto ships) or else loaded onto railcars or trucks for shipping. Secondary product, DEF will be sold in tankers (trucks).

2.3.3 Project Activities

2.3.3.1 Construction Phase

Construction will begin with site preparation work. The plan is to develop the eastern section of the site, which is approximately 2/3 of the land. Vegetation cover on the western part of the site will be kept, as well as the two branches of Mayrand Creek. Zéphirin-Deshaies Creek will have to be diverted. The site will be cleared and levelled. A sedimentation basin will be built for the construction phase of the project, to ensure the sedimentation of suspended matter in site drainage water; this will occur primarily during the site preparation phase. After clearing and levelling have been completed, the large-scale excavation work required for the buildings and process units will be done, and the foundations will be poured. Subsequently, the following stages will be carried out: mechanical installation of equipment and piping, electrical work and instrumentation, and erecting the buildings.

According to the route chosen for the conveyor system, 400 to 500 supports will have to be built on pilings (footprint of around 12.5 m² per support).

Systems will also have to be connected to existing infrastructure (water, electricity, sewer, effluent discharge pipes, etc.).

Around 1,000 workers will be required, on average, for the duration of the construction phase of the project, with 1,500 needed at the peak.

2.3.3.2 Operation Phase

Following completion of the equipment acceptance phase, the production equipment will be commissioned. The plant will operate continuously. Shutdown periods ranging from three to four weeks in length will be required every two years for inspection and preventive maintenance. Equipment rebuilding will be planned in order to extend service life.

IFFCO Canada will employ approximately 250 people.

2.3.3.3 Decommissioning and Closure Phase

Should the fertilizer production plant have to close, the industrial installations would be dismantled, and the site would be characterized and decontaminated as needed. The expected service life of the project is of 35 to 40 years.

2.4 EMISSIONS, DISCHARGES AND WASTE

The emissions, discharges and waste generated during the construction and the operation of the plant are presented in Table 3.

Table 3 Emissions, discharges and waste related to the IFFCO Canada project

TYPE OF EMISSION OR DISCHARGE	DESCRIPTION
Atmospheric emissions	During construction : exhaust fumes from the vehicles and equipment used for construction work
	During operation : <ul style="list-style-type: none"> • NOx and CO₂ generated by the burning of natural gas to produce steam (boiler) and ammonia. • CO₂ resulting from the conversion of natural gas into ammonia will be recovered and used completely to produce urea. • Urea particles and ammonia emission generated during granulation and emission of urea particules during manutention. • A wet scrubber will reduce ammonia emissions and dust collectors will collect urea emissions. • Flare to burn residual gas that could be emitted under abnormal operating conditions. • Use of Low NOx -emission burners. • Total greenhouse gas (GHG) emissions from the plant will put IFFCO Canada in the category of major emitters of GHGs. They should account for less than 1% of total Quebec emissions and less than 0.3% of total Canadian emissions.
Technological risk	<ul style="list-style-type: none"> • Technological risk analysis to evaluate different accident scenarios that can result from the production and the use of hydrogen and ammonia and of any other hazardous material. • Two ammonia tanks are going to be installed in order to reduce the consequences of accidental discharge and also to carry out the timely inspection of ammonia tanks as per the code of practice. • Strict operational control measures. • Development of an emergency response plan up in conjunction with the appropriate authorities and the consequences of accidental scenarios.
Liquid discharge	During construction: <ul style="list-style-type: none"> • Settling basin to reduce release of suspended solids in the stream during site preparation activities.
	During operation : <ul style="list-style-type: none"> • Process effluents (mainly condensates and boiler blowdown) will be treated and re-used as make-up water in the demineralization unit • The only liquid discharges will result from cooling tower blowdown, demineralization unit rinse water and surface water runoff from the industrial site • Equalization and holding tank before discharge into the St. Lawrence through the existing outfall belonging to the SPIPB. • Low concentrations of ammonia nitrogen, of minerals present in the water and residue from products used to condition the water needed for the steam and cooling systems. • The final effluent will be free of acute toxicity and will meet the environmental discharge objectives defined as to preserve and protect the quality of life of the aquatic environment.
Waste	<ul style="list-style-type: none"> • The urea production process will not generate any continuous production waste. • Used catalysts will either be returned to the supplier to be regenerated, or be sent to duly authorized companies for recycling or elimination. • The service life of catalysts is approximately 5 years. • Some hazardous residual materials will be generated through the maintenance and operation of plant equipment, including waste oil, used filters, batteries and dirty rags. • Residual materials will be put into barrels, removed from the site by an authorized company and managed in compliance with applicable regulations.

2.5 TIMETABLE

Table 4 presents the main stages of the project.

Table 4 Preliminary timetable for project implementation

TIME PERIOD	ACTIVITIES
September 2012	Filing of project notice with Quebec's MDDEFP
Summer/Fall/Winter 2012	Field surveys Preliminary engineering and selection of company to provide technology. Preparation of impact assessment study Information and consultation of local stakeholders
Winter 2013	File impact assessment study with appropriate authorities
Spring/Summer/Fall 2013	Preparation and filing of supplementary documentation (addenda) Environmental analysis of impact assessment study Public hearings – BAPE if necessary Detailed engineering Procurement activities
Spring 2014	Beginning of Plant construction
Spring 2017	Commissioning and start-up of commercial production Maintenance, control and monitoring
2052 to 2057	End of operations followed by dismantlement (if judged non profitable)

3 PROJECT LOCATION

3.1 LOCATION

The plant will be built on plots No. 3 and No. 4 of the Bécancour industrial park, the central point of which is located at coordinates 72°24'44" west and 46°21'34" north.

The Bécancour Waterfront Industrial Park was established by the Government of Quebec and is administered by the *Société du Parc Industriel et Portuaire de Bécancour* (SPIPB). In addition to the advantages associated with its natural gas supply, the industrial park is equipped with a deep-water seaport and well developed railway and highway networks. IFFCO Canada will be able to profit from an excellent transport network, which will facilitate both obtaining supplies of goods and services as well as distributing its output to both local and international markets.

The project site has an area of approximately 120 hectares. It is bounded by Raoul Duchesne Boulevard to the north and Highway 30 to the south. The project site is identified in Appendix A. The buildings and equipment will be concentrated in the eastern part of the site, which means that development will focus on a specific section. A railway track runs along the western edge of the site and cuts across it from west to east.

A conveyor system will be required to transport the urea from the production site to jetty B-1, where a ship loading system will also be needed. Two possible routes for the conveyor system are currently being examined. They are shown on maps 1 and 2 in Appendix A.

The closest residence lies approximately 350 m from the limits of the project site, within the SPIPB boundary limits. It should be over 1,400 m away from the ammonia tanks, where the plant's industrial infrastructure will be concentrated. The First Nations reserve of Wôlinak is located about 2.4 km from the project site (see Map 2, Appendix A)

3.2 PROPERTY OWNERSHIP AND LAND USE

The site is located in an industrial area. Under the Bécancour RCM land use and development plan and the City of Bécancour zoning plan, the area is zoned for heavy industry. The site lies within the limits of the SPIPB and has never been developed in the past. It does not encroach in any way on agricultural or other land. The site is served by the main industrial services (natural gas, water, electricity, railway, road access, etc.).

Plots No. 3 and No. 4

These plots belong to the SPIPB. IFFCO Canada holds an option to purchase the land, valid for 24 months, with a right to extend it for another six months.

Right-of-way for Conveyor System

For the planned route of the conveyor system, rights-of-way will have to be negotiated with the SPIPB. Depending on which route is chosen, it may be necessary to obtain rights-of-way from other users of the industrial park.

4 FEDERAL GOVERNMENT INVOLVEMENT

4.1 FINANCIAL SUPPORT

No financial support from the federal government or any of its agencies has been proposed or is anticipated for the fertilizer plant construction project.

4.2 FEDERAL LANDS

No federal lands will be used for the purpose of carrying out the project.

4.3 LEGISLATIVE OR REGULATORY REQUIREMENTS

Federal authorizations may be required pursuant to the following pieces of legislation:

- *Fisheries Act* (R.S.C., c. F-14) if Fisheries and Oceans Canada deems that the project causes harmful alteration, disruption or destruction of fish habitat;
- *Species at Risk Act* (R.S.C. 2002, c. 29) if it turns out that the project could have an impact on one of the species included on the official list of species at risk;
- *Migratory Birds Convention Act, 1994* (S.C. 1994, c. 22) if it turns out that the project could have an impact on migratory birds.

In addition, an emergency response plan that meets the requirements of the *Environmental Emergency Regulations* (SOR/2003-307) will be drawn up in cooperation with the appropriate authorities.

5 ENVIRONMENTAL EFFECTS

5.1 DESCRIPTION OF THE ENVIRONMENT

This section provides an overview of the physical, biological and socioeconomic components of the environment on the site where the plant is to be built and in a wider study area that encompasses all of the environmental components that could be affected by construction and operation of the planned facility. This description is based on the documentation consulted so far and on field visits. Further detail will be added to it on the basis of information gathered during consultations and from supplementary research conducted as part of the environmental study.

5.1.1 Physical Environment

Air quality

Air quality in the Bécancour region was subject to a special monitoring program carried out from 1995 to 2008. Between 1995 and 2008, pollutant concentrations overall remained stable and below the ambient air standards set out in the *Regulation respecting the quality of the atmosphere*. However, PM₁₀ concentrations over a 24-hour period did occasionally exceed MDDEP guidelines. The results of the Bécancour air quality monitoring program show that the region's industrial activities have little impact on the air quality of urbanized areas surrounding the industrial sector (Bisson, Busque et Therrien, 2009).

Physiography

The study area is located in the geological province of the St. Lawrence Lowlands. The Lowlands consist of series of terraces, beginning at an altitude of 14 m above the level of Lac Saint-Pierre. The City of Bécancour sits at an altitude of about 18 m. Generally, the land of the valley slopes gently down towards the St. Lawrence River. There are rock outcroppings in the north, near the St. Lawrence, notably in the industrial park.

Geology and Geomorphology

The main geomorphic units in the area of the industrial park are two till units (Bécancour and Gentilly), clays from the Champlain Sea, high terrace sands and rock. The thickness of the loose deposits varies between 3 m and 6 m, and tends gradually to increase in the estuary zone.

Hydrography

The Bécancour Waterfront Industrial Park is located on the south shore of the St. Lawrence. The study area's hydrographic system drains into the river. Its main components are the Bécancour River, approximately 2.3 km west of the site, and the Gentilly River, approximately 5 km to the east. A number of ditches and drainage canals crisscross the industrial park, following the old divisions of agricultural land. They generally run either parallel or perpendicular to the St. Lawrence and flow toward it. Two drainage streams, i.e. two branches of the Mayrand Creek and the Zéphirin-Deshaies Creek, run across the project site. These streams, clearly identified in Map 3 of Appendix A, have been channelled and are regularly maintained by the SPIP. Zéphirin-Deshaies Creek will have to be diverted around the site to allow the plant to be built.

Floodplain Area

Low-lying areas of the industrial park can be periodically flooded during spring high water. The flood-prone areas are associated to the shorelines of the main watercourses, notably along the St. Lawrence and in the lower reaches of the Bécancour River. The two possible conveyor routes cross some sectors that lie within the 0–2-yr and 0–20-yr flood plain. The height of the conveyor will be such that only the pillars would be located in the flood plain.

5.1.2 Biological Environment

5.1.2.1 Vegetation

The study area is located in the temperate Nordic vegetation zone and in the deciduous forest sub-zone. It also belongs to the bioclimatic field of the sugar maple–basswood forest. The flora is highly diversified in this field, and several species are at the northern limit of their distribution area.

Three distinct zones occupied by characteristic vegetation were observed in the study area. They are:

- The flood plain, on either side of the river, occupied by patches of vegetation adapted to very wet conditions;
- The agricultural zone, where there are uncultivated areas in regeneration that facilitate the establishment of pioneer species; and
- The upper terrace situated in the south end of the study area, occupied by forests of broad-leaved trees of tolerant and intolerant species, maple groves and conifer stands.

The project site is made up of terrestrial environments and a mosaic of wetlands, with the soil ranging from imperfectly to poorly drained across the site as a whole.

The terrestrial environments on the study site are covered by patches of forest and shrubby and grassy uncultivated land where shrubs and grass grow. The tree stratum of most of the forested patches is co-dominated by red ash and trembling aspen. There are also pure stands of Eastern cottonwood and stands dominated by red ash. The uncultivated land covered with shrubs and grass supports a typical mix of agricultural grasses, vegetables and a variety of colonizing species, generally associated with abandoned farmland.

Wetlands on the site, identified in Map 3 of Appendix A, cover a total of 31.4 ha. They form a mosaic of wooded swamps, shrubby swamps and marshes, interspersed with patches of drier land, clearly influenced by the presence of old abandoned farm ditches. In the wooded swamp areas, trembling aspen is co-dominant with red ash and red maple. Shrub swamp areas are dominated by speckled alder and willow, with some young red and black ash, as well as broad-leaved meadowsweet. In the marshes, some willow and alder grow around the edges, but otherwise only the herbaceous layer is present. Purple loosestrife is dominant in some areas, along with flat-topped aster. Common cattail, reed canary grass and common water reed were seen in the wetter areas.

No special-status flora species were found on the project site, except for the Ostrich Fern, a species classified as vulnerable to harvesting by the MDDEP in 2005. The *Centre de données sur le patrimoine naturel du Québec* (CDPNQ, Quebec environmental heritage data centre) and various studies have inventoried six special-status species in the study area. They are listed in Table 5. These species are typical of wetlands and are found in the flood-prone areas along the Bécancour River and the St. Lawrence. The wetlands and terrestrial (upland) environments on the project site have little ecological value and are unlikely to be home to special-status flora species.

Table 5 List of special-status flora species inventoried by CDPNQ in study area

Common name	Scientific name	Provincial status	Federal status	Details
Ostrich Fern	<i>Matteuccia struthiopteris</i>	Vulnerable to harvesting		Project site : ✓ Individuals observed on project site. Location available on demand because of the species' vulnerability to harvesting.
Riverbank wild rye ¹	<i>Elymus riparius</i>	SLDTV		1 report: ✓ Industrial Park, Bécancour. East of site previously used by Norsk Hydro and of Arthur Sicard Blvd. Diffuse population of around 20 to 30 specimens.
Branched bur-reed ¹	<i>Sparganium angrocladum</i>	SLDTV	priority 3 candidate	1 report: ✓ City of Bécancour, right bank of Bécancour River. Marsh on edge of pond. A hundred or so specimens.
Yellow water-crowfoot ¹	<i>Ranunculus flabellaris</i>	SLDTV		1 report: ✓ City of Bécancour, approximately 370 m south of Bécancour bay. Some 50 specimens in a stand of silver maple and red ash.
Water speedwell ¹	<i>Veronica anagallis-aquatica</i>	SLDTV		1 report: ✓ Bécancour, mouth of Bécancour River. Point of Chemin de l'Anse, in a sandy wetland.
Annual wild rice ¹	<i>Zizania aquatica</i> var, <i>aquatica</i>	SLDTV		1 report: ✓ Bécancour RCM, mouth of Bécancour River, Île Lamy sud, on the point at the end of Chemin de l'Anse.
False pimpernel ²	<i>Lindernia dubia</i> var. <i>Inundata</i>	SLDTV		1 report: ✓ Bécancour RCM, east of the industrial park port, on either side of the Gentilly power station.

Note: SLDTV – Species on the list of species likely to be designated threatened or vulnerable.

Source: ¹ CDPNQ, 2012.

² Génivar, 2008.

5.1.2.2 Wildlife

Terrestrial Wildlife

Large terrestrial fauna in the study area is represented by the white-tailed deer, the moose and the black bear. A white-tailed deer yard is present in the southern part of the study area, which represents the only terrestrial wildlife habitat, as defined in the *Regulations respecting wildlife habitats*, within the study arear (see Map 2, Appendix A).

Amongst small terrestrial fauna species, the muskrat is the most abundant species and the one most sought after by trappers. The other species often trapped are racoon , beaver, red fox, coyote and fisher. Weasel, mink, skunk, squirrel, otter and American marten are also trapped, but in lesser quantities. Potential habitat for most of these species is more limited (CRRNT, 2010).

Besides the species targeted by trappers, a number of small mammals, including the southern red-backed vole, the meadow vole , the deer mouse , the meadow jumping mouse and the cinereus shrew (Maisonneuve et al., 1996), are also found in the region.

During the field surveys, on August 22, September 5 and September 19, 2012, tracks of white-tailed deer and moose were seen. Lastly, fox faeces were also found. These observations provide evidence of the species that currently use the site for their activities.

Birds

A total of 187 bird species have been observed within the limits of the study area since 1981 (RQO, 2012). Many of these species use the study area for breeding purposes. According to the *Quebec Breeding Bird Atlas* (QBBA, 1995), 114 species potentially breed within the reference territory in question, corresponding to two 100 km² squares that encompass the study area. Of these 114, 31 are possible breeders, 38 are probable breeders and 36 are confirmed breeders. The majority of these species (91) are considered to be migratory.

The wetlands of the study area provide suitable habitat for the feeding and staging of waterfowl during spring and fall migrations. In addition, wet meadows and swamps are ideal habitat for breeding. On the other hand, reproductive potential remains limited because of a lack of cover, which makes birds reluctant to use the area for breeding and brooding. As farmland has increasingly been left fallow since the establishment of the industrial park, sites suitable for waterfowl breeding have tended to disappear. Within the study area are two recognized waterfowl gathering areas (WFGA), as defined in the *Regulation respecting wildlife habitats* (MRN, 2012). The two areas extend along the south shore of the St. Lawrence (Map 2, Appendix A).

Among waterfowl species, the Canada goose, nine species of diving ducks and nine species of dabbling ducks breed in the Central Quebec region, which includes the study area (Table 6).

Table 6 Breeding bird species according to Canadian Wildlife Service (CWS) helicopter inventory, Central Quebec, 2004–2008).

COMMON ENGLISH NAME	LATIN NAME
Dabbling ducks	
American wigeon	<i>Anas americana</i>
Wood duck	<i>Aix sponsa</i>
Gadwall	<i>Anas strepera</i>
Mallard	<i>Anas platyrhynchos</i>
American black duck	<i>Anas rubripes</i>
Northern pintail	<i>Anas acuta</i>
Northern shoveler	<i>Anas clypeata</i>
Blue-winged teal	<i>Anas discors</i>
Green-winged teal	<i>Anas crecca</i>
Diving ducks	
Ring-necked duck	<i>Aythya collaris</i>
Canvasback	<i>Aythya valisineria</i>
Greater scaup	<i>Aythya marila</i>
Greater scaup or lesser scaup	<i>Aythya sp.</i>
Lesser scaup	<i>Aythya affinis</i>
Common golden eye	<i>Bucephala clangula</i>
Bufflehead	<i>Bucephala albeola</i>
Common merganser	<i>Mergus merganser</i>
Hooded merganser	<i>Lophodytes cucullatus</i>

Source : CRRNT, 2010

Fish

The fish community encountered in the section of the St. Lawrence between Trois-Rivières and Gentilly counts 64 fish species. Most of them are common to southwestern Quebec.

According to a study conducted by the MRN in 2001 as part of the Réseau de Suivi Ichtyologique (RSI, fish monitoring system), the species most often caught in the stretch of the St. Lawrence between Bécancour and Batiscan were yellow perch, shorthead redhorse, walleye, sauger, lake sturgeon and white sucker (MRN, 2008). Alternatively, shore species (caught by seine fishing) were banded killifish, perch, bluntnose minnow and tessellated darter.

Most recently, in 2008, seine fishing on the south shore of the St. Lawrence, between the mouth of the Bécancour River and the port of Bécancour was dominated by perch, banded killifish, spottail shiner, alewife, golden shiner, bluntnose minnow, tessellated darter, round goby, pumpkinseed sunfish and fallfish (Pascale Dombrowski, MRN, personal communication, 2012).

The flood plain and small watercourses (creeks and drainage canals) can represent spawning or nursery areas important for the survival of many fish species. In fact, it was demonstrated that these habitat constitute potential spawning area, namely for the channel catfish, spottail shiner, perch, northern pike, carp, redhorse, rainbow smelt and lake whitefish (see Map 2, Appendix A) (Armellin and Mousseau,1998). Secondly, confirmed spawning areas for white sucker, northern sucker, silver redhorse, shorthead redhorse, river redhorse, walleye, smallmouth bass and channel catfish are also present in the Bécancour River (Alliance Environnement, 2005; Armellin and Mousseau, 1998). Thirdly, spawning sites for many fish species (Castonomidés sp., lake whitefish, carp, cyprinus sp, walleye sp., northern pike, darter sp., killifish, channel catfish and perch) were also registered the area of the Gentilly nuclear power station (Alliance Environnement, 2007).

Finally, data extracted from 2011 activity reports on scientific, educational or wildlife management fishing (*SEG permits*) show that at least 25 species are found in the small watercourses and ditches of the industrial park (table 7). Fifteen species were specifically fished in the creeks and ditches of the project site. Water courses and ditches present on the project site are clearly illustrated in Map 3 (Appendix A).

Table 7 Fish species identified in the creeks and ditches of the Bécancour Industrial park

Common English name	Latin name	Project Site					Other creeks and ditches in the Industrial park
		Ditch on Georges E. Ling Ave.	Zéphirin-Deshaies Creek	Mayrand Creek (east branch)	Mayrand Creek (west branch)	Ditch on south side of railway track	
Brown bullhead	<i>Ameiurus nebulosus</i>				x		X
White sucker	<i>Catostomus commersoni</i>	x		x	x		X
Brook stickleback	<i>Culaea inconstans</i>	x	x	x	x	x	X
Common carp	<i>Cyprinus carpio</i>	x	x				X
Spotfin shiner	<i>Cyprinella spiloptera</i>		x		x		X
Banded killifish	<i>Fondulus diphanus</i>	x	x		x	x	X
Pumpkinseed sunfish	<i>Lepomis gibbosus</i>	x					X
Golden shiner	<i>Notemigonus crysoleucas</i>				x		
Spottail shiner	<i>Notropis hudsonius</i>				x	x	X
Yellow perch	<i>Perca flavescens</i>	x			x		X
Northern redbelly dace	<i>Phoxinus eos</i>	x	x	x	x		X
Finescale dace	<i>Phoxinus neogalus</i>		x		x		
Fathead minnow	<i>Pimephales promelas</i>	x	x	x	x	x	
Creek chub	<i>Semioilus atromaculatus</i>	x	x	x	x	x	X
Central mudminnow	<i>Umbra limi</i>	x	x	x	x	x	X
Common shiner	<i>Luxilus cornutus (Notropis cornutus)</i>						X
Emerald shiner	<i>Notropis atherinoides</i>						X
Bluntnose minnow	<i>Pimephales notatus</i>						X
Johnny Darter	<i>Etheostoma nigrum</i>						X

Common English name	Latin name	Project Site					Other creeks and ditches in the Industrial park
		Ditch on Georges E. Ling Ave.	Zéphirin-Deshaies Creek	Mayrand Creek (east branch)	Mayrand Creek (west branch)	Ditch on south side of railway track	
Bluegill	<i>Lepomis macrochirus</i>						X
Ninespine stickleback	<i>Pungitius pungitius</i>						X
Northern pike	<i>Esox lucius</i>						X
Sunfish spp	<i>Lepomis sp.</i>						X
Burbot	<i>Lota lota</i>						X
Brassy minnow	<i>Hybognathus hankinsoni</i>						X

Source: MRN, 2012

Special-Status Wildlife Species

No wildlife species at risk was found on the project site. However, nine species of birds and nine species of fish having a special status under the federal *Species at Risk Act* (SRA) or under the Quebec *Act respecting threatened or vulnerable species* (Table 8) have been inventoried in the study area. All the special-status fish were caught in the St. Lawrence, except for the brassy minnow, which was caught in a small watercourse in the industrial park, outside the project site.

Table 8 Special-status wildlife species found in study area

COMMON ENGLISH NAME	SCIENTIFIC NAME	FEDERAL STATUS	PROVINCIAL STATUS
Breeding birds			
Peregrine falcon	<i>Falco peregrinus</i>	Special concern	Vulnerable
Short-eared owl	<i>Asio flammeus</i>	Special concern	SLDTV
Least bittern	<i>Ixobrychus exilis</i>	Threatened	Vulnerable
Black tern	<i>Chlidonias niger</i>	-	Candidate for assessment
Chimney swift	<i>Chaetura pelagica</i>	Threatened	SLDTV
Barn swallow	<i>Hirundo rustica</i>	Threatened	SLDTV
Canada warbler	<i>Wilsonia canadensis</i>	Threatened	SLDTV
Bobolink	<i>Dolichonyx oryzivorus</i>	Threatened	SLDTV
Eastern meadowlark	<i>Sturnella magna</i>	Threatened	SLDTV
Fish			
American shad	<i>Alosa sapidissima</i>	Intermediate priority (2)	Vulnerable
American eel	<i>Anguilla rostrata</i>	Being studied (SRA) Special concern (COSEWIC)	SLDTV
Striped bass (St. Lawrence pop.)	<i>Morone saxatilis</i>	Extirpated	-
River redhorse		Special concern	SLDTV
Eastern sand darter		Endangered	SLDTV
Rainbow smelt (estuary south shore pop.)		-	Vulnerable
Lake sturgeon		-	SLDTV
Channel darter		Endangered	Vulnerable
Brassy minnow	<i>Hybognathus hankinsoni</i>	Intermediate priority (2)	SLDTV

Note: SLDTV – Species on the list of species likely to be designated threatened or vulnerable.

5.1.2.3 Protection and Conservation Areas

The project site does not lie within a protection or conservation area. In the study area, however, there are a few wildlife habitats designated in Quebec under the *Regulation respecting wildlife habitats*. They are shown on the Map 2 in Appendix A.

5.1.3 Human Environment

Archaeological and Heritage Sites

Eight archeological sites are recorded in the study area. These are identified in Map 2 (Appendix A). Various areas having prehistoric and historic archeological potential have been identified on the plant construction site and along the two possible conveyor routes. IFFCO Canada is committed to following the recommendations made by Arkéos in its assessment of archeological potential (Arkéos, 2012), namely, to conduct archeological inventories in the developed areas before starting work.

First Nations

The Wôlinak Abenaki First Nation reserve, which has an area of 1.5 km², is an enclave within the Bécancour RCM. Under federal jurisdiction, the reserve is located in the study area, to the south of the Bécancour sector, on the west bank of the Bécancour River. The reserve is found about 2.4 km to the south-west of the planned site for IFFCO Canada's urea plant. The CN railway that will be used to ship urea product crosses part of the reserves territory.

5.2 DESCRIPTION OF ENVIRONMENTAL EFFECTS

The changes to fish and their habitat, aquatic species and migratory birds that may be caused by the project are summarized in table 9.

Table 9 Environmental effects of the projects

ENVIRONMENTAL COMPONENTS	ANTICIPATED IMPACTS
Effects on Fish and Fish Habitat	<ul style="list-style-type: none"> • Loss and disruption of habitat as a result of the diversion and redevelopment of a watercourse on the project site (Zéphirin-Deshaies Creek); • Loss and disruption of habitat as a result of the erection of support pillars for the conveyor system on the flood plain (total footprint of approximately 1400 m² (option 2) and 2330 m² (option 1)); • Temporary degradation of habitat by the input of fine particulate matter in watercourses on the plant site during construction is also anticipated • Project effluent will be discharged via an existing outfall and will respect the environmental discharge objectives defined for the preservation and protection of the quality of life of the aquatic environment
Effects on Aquatic Species	<ul style="list-style-type: none"> • Five at-risk aquatic species identified in the study area: striped bass (St. Lawrence population), river herring, eastern sand darter, bridge shiner and channel darter; • All caught in the St. Lawrence, except the eastern sand darter, found in the Bécancour and Gentilly Rivers; • Loss and disruption of potential habitat as a result of the erection of support pillars for the conveyor system in the floodplain; • The potential use of these environments by at risk aquatic species will be evaluated during the impact assessment; • Recent fish surveys (2011 SEG permits, MRNF 2012) on the project site did not reveal the presence of aquatic species at risk
Effects on Migratory Birds	<ul style="list-style-type: none"> • Bird life disturbance by construction work; • Habitat loss related to clearing of site, which will be limited to the eastern part of the site; • No nidification sites identified on the project site during field surveys or in existing data.
Effects on Federal Lands and Areas Outside Quebec	<ul style="list-style-type: none"> • No direct impact is anticipated on federal lands, in another province or beyond Canada's borders; • An indirect transboundary impact, including potentially on climate change, could result from GHG emissions from the fertilizer production plant; • Total quantity of GHGs should represent less than 1% of total Quebec emissions and less than 0.3% of total Canadian emissions.
Effects on Aboriginal Peoples	<ul style="list-style-type: none"> • The First Nations reserve of Wôlinak is located 2.4 km from the project site; • No anticipated impact noise or atmospheric emissions from the plant on the Aboriginal community; • The site of the future plant lies within a vast hunting and trapping area of the Abenakis of Odanak and Wôlinak. No impact is anticipated because hunting and fishing are prohibited on the SPIPB's land located north of highway 30; • Positive impacts related to job creation and boost in economic activity resulting from the construction and operation of the plant; • Targeted archaeological inventories will be done of the areas of prehistoric and historic potential identified in the plant construction site and the two conveyor route options before the construction work begins.

6 ENGAGEMENT AND CONSULTATION WITH ABORIGINAL GROUPS

6.1 APPROACH TO CONSULTATION

Consultations were held with the Grand Council of the Waban-Aki Nation. As for the consultations with non-Aboriginal stakeholders, the main objectives of the meeting were to:

- To deepen knowledge of the environment;
- Identify the concerns and expectations of the Grand Council of the Waban-Aki Nation that should be taken into consideration during the development phases of the project;
- Take note of the suggestions and expectations of the Grand Council of the Waban-Aki Nation regarding the other consultation phases to come;
- Establish a relationship between IFFCO Canada and the Grand Council of the Waban-Aki Nation, chiefly through open, constructive dialogue.

6.2 PARTICIPANTS

The Grand Council of the Waban-Aki Nation represents two Abenaki band councils: Odanak and Wôlinak. The latter community is the one located close to IFFCO Canada's future site. The Odanak community lies about 40 km west of the study area, in the vicinity of Pierreville.

A meeting about the project was held with the Grand Council on October 16, 2012. The main comments and concerns expressed at that meeting will be presented in the social and environmental impact assessment (SEIA) for the project, to ensure not only that the remarks remain confidential for the time being, but also that the ongoing consultations proceed smoothly.

6.3 TRADITIONAL ACTIVITIES

According to the Grand Council of the Waban-Aki Nation, the planned site of IFFCO Canada's production facility, like all of the land belonging to the SPIPB, lies on ancestral lands of the Abenaki communities. At present, no official land claim has been made regarding this territory, but research is under way to gather evidence of the historical use and occupancy of the territory by the Abenakis.

No hunting is allowed on land within the industrial park, north of Highway 30, where the project will be located. Thus, no impact is anticipated on aboriginal hunting or trapping activities.

6.4 UPCOMING CONSULTATIONS

Consultations with the Odanak and Wôlinak band councils are planned to in the next few months. SNC-Lavalin's project team is currently deciding on the best way to consult the band councils, taking into consideration the recommendations made by the Grand Council of the Waban-Aki Nation.

7 CONSULTATION WITH THE PUBLIC AND OTHER PARTIES (OTHER THAN ABORIGINAL CONSULTATION)

7.1 APPROACH TO CONSULTATION

Public consultation is part of the process of assessing the project's social and environmental impacts. The main purpose is to provide the different stakeholders with objective information so that the concerns and expectations they express can be taken into consideration right from the project design stage.

The consultation process for the project has two main components: issues scoping consultations followed by targeted information, consultation and public information activities. The scoping consultations phase is completed.

Consultations could also be held by the *Bureau des audiences publiques sur l'environnement* (BAPE), once the impact study has been filed with the proper provincial authorities and made public.

7.2 PARTICIPANTS

The consultation process provides opportunities to meet with the various stakeholders concerned, chiefly in the administrative regions of Central Quebec and the Mauricie. Stakeholders fall into the following categories:

- Political: Federal MPs and Quebec MNAs;
- Project partners: Main partners in the project;
- Public administration: Officials from Government of Quebec ministries and agencies, as well as representatives of cities, towns and regional county municipalities (RCM);
- Residents: A sampling of residents living within the study area;
- Industrial: Industries located near IFFCO Canada's planned future site in Bécancour;
- Environment: Various environmental groups;
- Economic: Main economic organizations in these regions;
- Education: Main educational organizations and institutions in these regions;
- Social: Main social service agencies in these regions;
- First Nations: Representatives of Aboriginal communities (see Section 0);
- Infrastructure: Organizations whose infrastructure and services will be relied upon in project development.

Officials from the RCM, the City of Bécancour and the MDDEFP have also been consulted to identify, using their knowledge of the territory, development issues.

7.3 MAINS OBSERVATION AND PREOCCUPATIONS

The main issues identified by stakeholders up until now, during the exploratory consultations, are listed hereunder. The opinions expressed were grouped by themes in order to present a general synthesis of the meetings, but also to ensure the information shared remain anonymous.

Table 10 Preoccupations identified during the exploratory consultations

THEME	DESCRIPTION
Economic issues	
Local economic spinoffs	Ensuring host community truly benefits from the project (jobs and sub-contracts)
	Support for local industrial development (especially in a context of plant closings)
	Social implication of the project proponent in the local host community
Workforce	Competition among industries with respect to qualified labour availability
	Employability of specialized workers trained for specific needs in other industries
	Unilingual workforce faced to foreign investors
	Loss of labour in traditional sectors in favour of more competitive industries
Partners	Capacity for local project partners to better compete
Agriculture	Strengthening of local, provincial and national supply of urea
	Decrease in production costs for urea users
Sociopolitical issues	
Host community support	Project well perceived and openness to the arrival of industrial projects in the Bécancour Industrial Park.
	Great consumption of natural gas and perception of an increase in pressure for the development of shale gas.
	Importance of a good understanding of the project and its impacts by the host community
	Justification of chemical fertilizer in a sensitive environment regarding sustainable development
	Consideration of the impact of plant construction on lanscape
	Establishment of good relations with the city of Bécancour and other industries
Life quality	Preservation of life quality and health for neighbors (including North Shore)
	Increase of traffic in the region, particularly trucks
	Preservation of infrastructure, recreational and vacation areas
Newcomers	Adaptation and integration of IFFCO to Quebec
	Local infrastructure capacity for hosting new workers
Political support	Consideration of the regional socioeconomic climate (affected by the closing of Gentilly-2 nuclear power plant)
	Long term support from Quebec government
First Nations	Recruitment of Aboriginal workers and contractors

THEME	DESCRIPTION
<i>Environmental issues</i>	
Industrial risks	Management and handling of chemical products, notably ammonia, in the urea production process.
	Risks and nuisances associated with transportation of urea (truck, train, ship)
Emissions and pollutants	Management of urea plant emissions and effluents
	Increase of Quebec's greenhouse gas (GHG) footprint
	Environmental impacts related to the use of chemical fertilizers
	Consideration of cumulative impacts of related to the arrival of several major projects in Bécancour
Conservation	Integration to the region's sustainable development, notably in regards to energy efficiency
	Protection of natural environments within and around the Industrial Park (Montesson Island, Bécancour River, wetlands).

8 REFERENCES

- ALLIANCE ENVIRONNEMENT. 2007. Projet de modification des installations de stockage des déchets radioactifs et réfection de la centrale nucléaire de Gentilly-2. Rapport annuel 2006, Activités de suivi environnemental. Révision 3, juin 2007.
- ARMELLIN, A. et P. MOUSSEAU, 1998. Synthèse des connaissances sur les communautés biologiques du secteur d'étude Trois-Rivières–Bécancour. Zones d'intervention prioritaire 12 et 13. Environnement Canada - Région du Québec, Conservation de l'environnement, Centre Saint-Laurent. Rapport technique. 256 p.
- ARKEOS INC., 2012. Projet de production d'engrais d'IFFCO Canada à Bécancour. Étude de potentiel archéologique. Produit pour SNC-Lavalin Environnement. 40 p.
- ASSOCIATION QUÉBÉCOISE DES GROUPE D'ORNITHOLOGUES (AQRO), 1995. Atlas des oiseaux nicheurs du Québec méridional (AQGO). Banque informatisée de données. Association québécoise des groupes d'ornithologues, Société québécoise pour la protection des oiseaux, Service canadien de la faune d'Environnement Canada, région du Québec.
- BISSON, M., BUSQUE, D. et THERRIEN, M., 2009. La qualité de l'air à Bécancour entre 1995 et 2008, Québec, ministère du Développement durable, de l'Environnement et des Parcs, Direction du suivi de l'état de l'environnement, ISBN : 978-2-550-56760-8 (PDF), 12 p. et 1 annexe. CENTRE DE DONNÉES SUR LE PATRIMOINE NATUREL DU QUÉBEC (CDPNQ), 2012. Espèces à statut particulier- Parc industriel- Bécancour. Système géomatique de l'information sur la biodiversité. 5 p.
- CHERRADI, M. 1987. Étude de l'abondance et de la diversité des poissons du fleuve Saint-Laurent dans le secteur de la centrale nucléaire de Gentilly. Québec, Université du Québec. 119 p.
- COMMISSION REGIONALE SUR LES RESSOURCES NATURELLES ET LE TERRITOIRE DU CENTRE-DU-QUEBEC (CDPNQ), 2010. Portrait faunique du Centre-du-Québec. Document produit par la Fédération québécoise des chasseurs et pêcheurs, région 17. 119p.
- COUTURE, R., J. LAPERRIÈRE et G. VAILLANCOURT, 1976. Secteur du fleuve Saint-Laurent, région du complexe nucléaire Gentilly 1975-1976. Études ichtyologiques. Université du Québec à Trois-Rivières. 130 p.
- FOURNIER, D., MAILHOT, Y. et D. BOURBEAU, 1997. Rapport d'opération du réseau de suivi ichtyologique du fleuve Saint-Laurent : Échantillonnage des communautés ichtyologiques du tronçon Gentilly – Batiscan en 1996. Ministère de l'Environnement et de la Faune, Direction de la faune et des habitats, Direction régionale Mauricie - Bois-Francs. 61 p.

GENIVAR, 2008. Programme décennal de dragage d'entretien des installations portuaires de Bécancour. Étude d'impact sur l'environnement déposée à la ministre du Développement durable, de l'Environnement et des Parcs. Rapport principal et annexes. Société du parc industriel et portuaire de Bécancour.

HYDRO-QUEBEC, 1990. Étude de la végétation riveraine près de la centrale nucléaire Gentilly 2 et importance des habitats pour la faune ichtyenne, Nove environnement inc., 62 p.

LAMONTAGNE, G. et S. LEFORT, 2004. Plan de gestion de l'original 2004-2010. Ministère des Ressources naturelles, de la Faune et des Parcs, Direction du développement de la faune. 265 p.

LAMONTAGNE, G., H. JOLICOEUR et S. LEFORT, 2006. Plan de gestion de l'ours noir 2006-2013. Ministère des Ressources naturelles et de la Faune, Direction du développement de la faune. 487 p

Maps of the Study Area and Project Site

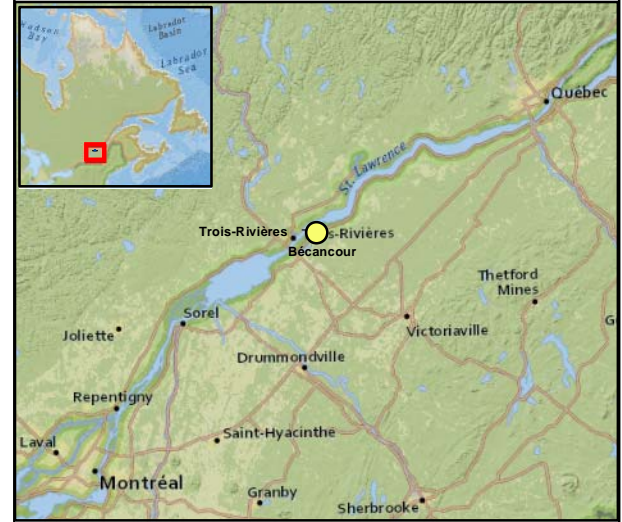


PROJECT

- Study Area
- Project Site
- Conveyor Option 1
- Conveyor Option 2

INFRASTRUCTURES AND LIMITS

- Highway
- National Road
- Secondary Road
- Railway
- Electricity Transmission Line
- Bécancour Waterfront Industrial Park Limit
- Protected Agricultural Area Limit



Cartographic Basemap:
BDTQ, 1 : 20 000, MRNF Québec,
Orthophoto: Bécancour RCM, 2010

Title

**Study Area and Fertilizer
Production Plant Site**

Project

FERTILIZER PRODUCTION PLANT PROJECT

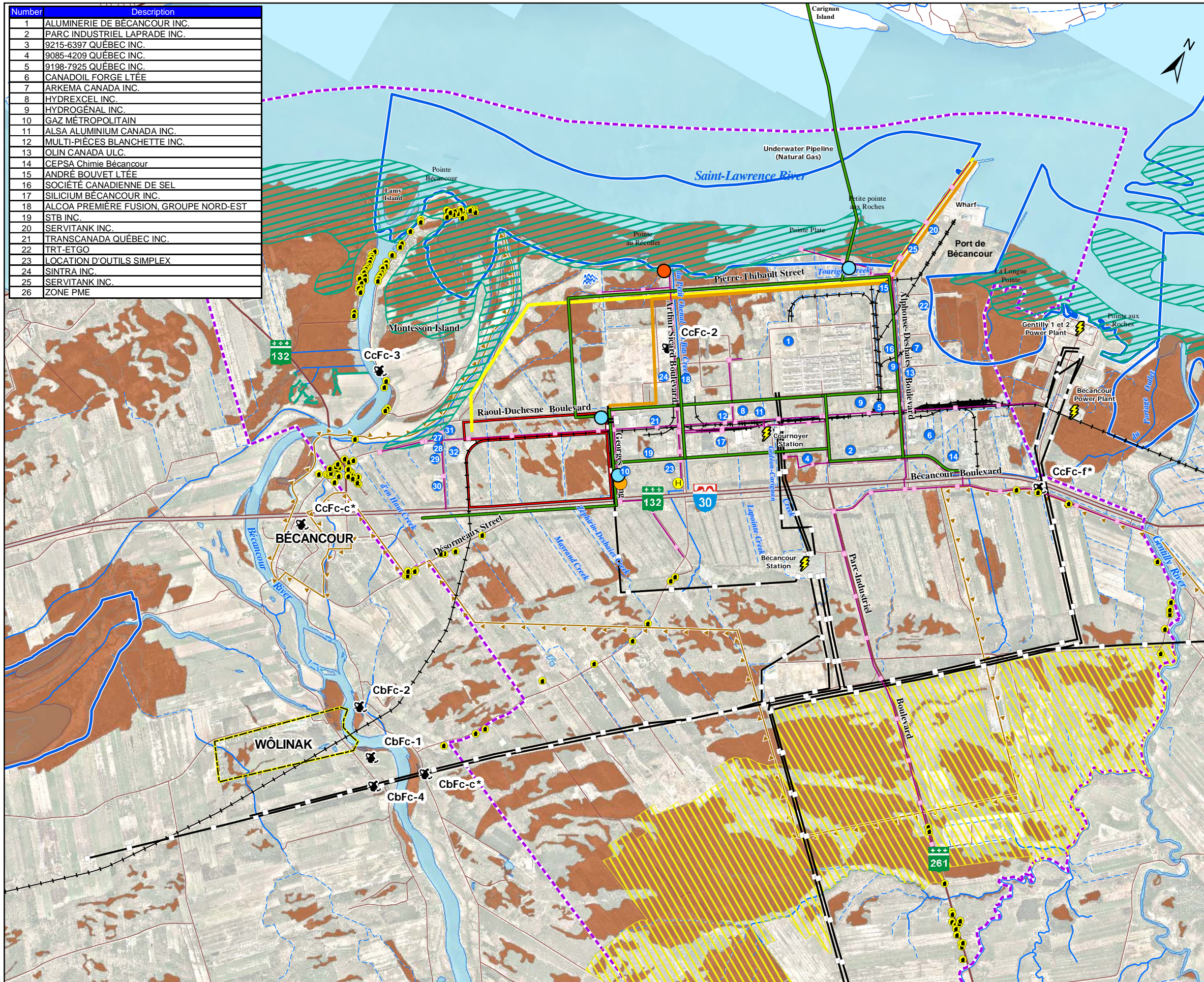
Project Manager	Drawn by	Verified by
L. Lachapelle	H. Dubois	M. Brennan-Jacot

Client	Consultant
IFFCO Canada	SNC-LAVALIN Environment

Scale	Project Number	Filename
0 500 1 000 m	611020	Figure4-01_StudyArea.mxd

01	08/11/2012	Preliminary	H. D.	M. B.-J.
No.	Date	Description	Drawn	Verified

Number	Description
1	ALUMINERIE DE BÉCANCOUR INC.
2	PARC INDUSTRIEL LAPRADE INC.
3	9215-6397 QUÉBEC INC.
4	9085-4209 QUÉBEC INC.
5	9198-7925 QUÉBEC INC.
6	CANADOIL FORGE LTÉE
7	ARKEMA CANADA INC.
8	HYDREXCEL INC.
9	HYDROGÉNAL INC.
10	GAZ MÉTROPOLITAIN
11	ALSA ALUMINIUM CANADA INC.
12	MULTI-PIÈCES BLANCHETTE INC.
13	OLIN CANADA ULC.
14	CEPSA Chimie Bécancour
15	ANDRÉ BOUVET LTÉE
16	SOCIÉTÉ CANADIENNE DE SEL
17	SILICIUM BÉCANCOUR INC.
18	ALCOA PREMIÈRE FUSION, GROUPE NORD-EST
19	STB INC.
20	SERVITANK INC.
21	TRANSCANADA QUÉBEC INC.
22	TRT-ETGO
23	LOCATION D'OUTILS SIMPLEX
24	SINTRA INC.
25	SERVITANK INC.
26	ZONE PME



PROJECT

- Project Site
- Conveyor Option 1
- Conveyor Option 2

INFRASTRUCTURES AND LIMITS

- Highway
- National Road
- Secondary Road
- Railway
- Bécancour Waterfront Industrial Park Limit
- Indian Reserve

INDUSTRIAL INFRASTRUCTURES

- Electricity Station / Power Plant / Cogeneration
- Gaz Métro Station
- Heliport
- Industrial Water Pumping Station
- Potable Water Pumping Station
- Purification Sewage
- 120kV-230kV Power Line
- 600V-25kV Power Line
- Natural Gas

HUMAN ENVIRONMENT

- Residence in the Industrial Park
- Archeological Site

BIOLOGICAL ENVIRONMENT

- Wetland
- Wildlife Habitats
 - White-tailed Deer Yard
 - Water Fowl Gathering Area
 - Potential Fish Spawning Area

Title
Project Study Area

Project
FERTILIZER PRODUCTION PLANT PROJECT

Project Manager L. Lachapelle	Drawn by H. Dubois	Verified by M. Brennan Jacot
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Client IFFCO Canada Ltée	Consultant SNC•LAVALIN Environment
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Scale 0 300 600 900 m	Project Number 611020	Filename FigureX_Description_PriFed.mxd
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01	15/11/2012	Préliminaire	H. D.	M. B. J.
No.	Date	Description	Drawn	Verified



PROJECT

Project Site

BIOLOGICAL ENVIRONMENT

Wetland Mosaic

Number	Area (ha)
1	17.9
2	9.0
6	0.5
5	1.2
4	1.3
3	1.4
7	0.2
8	0.03

INFRASTRUCTURES AND LIMITS

- Highway
- Secondary Road
- Railway
- Electricity Transmission Line

Cartographic Basemap:
BDTQ, 1 : 20 000, MRNF Québec,
Orthophoto: Bécancour RCM, 2010

Title
Wetlands on the Project Site

Project
FERTILIZER PRODUCTION PLANT PROJECT

Project Manager L. Lachapelle	Drawn by H. Dubois	Verified M. Brennan Jacot
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Client IFFCO Canada	Consultant SNC•LAVALIN Environment
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Scale 0 100 200 m 	Project Number 611020	Filename Figure4-04_Wetlands.mxd
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No.	Date	Description	Drawn	Verified
02	07/11/2012	Preliminary	H. D.	M. B. J.
01	12/10/2012	Preliminary	H. D.	M. B. J.