PRESENTATION TO THE BUREAU DES
AUDIENCES PUBLIQUES SUR L'ENVIRONNEMEI

UPGRADING THE ROCKFILL DAM AND THE DIKES OF THE RAPIDES-DES-QUINZE PROJECT

JUNE 20, 2001

Version of 29/06/01

(Slide #1: title of project with photos)

Good evening ladies and gentlemen.

As Mr Tremblay has already mentioned, the purpose of my talk tonight is to present to you, on behalf of Hydro-Québec, the project to upgrade the rockfill dam and dikes of the Rapides-des-Quinze project.

To permit me to reply quickly and accurately to any questions that may arise, I'm accompanied by two resource people, Mr. Claude Mercier, engineering and procurement administrator on my right, and on my left, Mr Benoit Gagnon, head of the environment project, who will also be addressing you, this time about the environmental impact of the project.

In the course of my presentation, I shall be dealing with three major topics:

(Slide #2: the topics)

- The nature of the project and its rationale
- The process of communication and dialogue with the community
- The environmental impact and alleviating measures, and
- The positive benefits of the project.

DESCRIPTION OF THE RAPIDES-DES-QUINZE PROJECT:

I would like to begin, however, by describing the Rapides-des-Quinze project to you.

(Slide #3: restricted zone)

The project is situated on the headwater of the Outaouis River, on the territories of the Guérin, St-Eugène de Guigues et Angliers municipalities, in the county regional municipality of Témiscamingue.

The purpose of the Rapides-des-Quinze project is to regulate the natural intake that feeds the Rapides-des-Quinze, the Rapides-des-îles and the Première-Chute generating stations, which are all situated directly downstream, and are operated by Hydro-Québec.

(Slide #4: figure 2.2 of the project proposal)

This is situated some four kilometres downstream from the des Quinze dam, which belongs to Public Works and Government Services Canada and controls the intake from the lac des Quinze.

It includes a generating station equipped with six turbine-generator units with a total installed capacity of 95 MW and a dam situated approximately 1.5 kilometres upstream from the station.

(Slide #5: figure 3.1 of the project proposal)

The dam has a 400-metre-long, 20-metre-wide concrete spillway that is supported, on its right side, by the Rapides-des-Quinze rockfill dam. This approximately 410-metre-long dam completes the closure, on the right shore, of the main valley of the Outaouis River.

(Slide #6: map of dikes)

Approximately 4.5 kilometres south-west of the spillway there are two small dikes constructed on Lakes Long and Talé; their purpose is to contain the waters of the reservoir.

(Slide #7: aerial view of lac Long)

The lac Long dike seals off a small valley situated north-east of lac Long.

(Slide #8: aerial view of lac Talé)

The lac Talé dike is situated northwest of lac Long.

DESCRIPTION OF THE PROJECT:
(Slide #9: aerial view of the Des Quinze dam)

Now what does this $2.8 million upgrading project consist of exactly?

First of all, I want to make it clear that it relates to the filling work to be carried out on the Rapides-des-Quinze project, namely the dam adjacent to the principal spillway and the dikes of Lakes Long and Tally.

The dam will undergo priority civil engineering work. One of the tasks will be to flatten the slope of the downstream fill.

This will involve excavating the existing cover and fill on the dam and the dikes. The excavated material will then be used to fill in part of the downstream slope. A geomembrane will be installed on the upstream side. This will be followed by the filling in of the upstream side and the raising of the dam.

The materials will come from a quarry situated immediately on the right shore of the dam.

(Slide #10: nature of work on dam and dikes)

The watertightness factor and the crest will thus be raised to comply with current laws and safety standards respecting dams.

RATIONALE FOR THE PROJECT:

What are the reasons behind Hydro-Québec's decision to undertake priority civil engineering upgrading work on the rockfill dam and the dikes of the Rapides-des-Quinze project?

It must first of all be remembered that this hydroelectric project is the oldest in Abitibi-Témiscamingue. Several of these facilities date from 1923, which explains the urgency of carrying out upgrading work to ensure their longevity and the safety of the public.

Studies carried out in 1988 on the dam and the dikes brought us to the realization that the crest of the watertightness factor is not in compliance with the safety standards defined on the basis of the probable maximum flood.

Furthermore, we observe that the slope of the rockfill dam's downstream fill is too steep according to Hydro-Québec's current design criteria.

(Slide #11: major points)

In short, the primary aim of the project is to:

- Ensure the safety of the public and of property at maximum probable flood, thereby bringing the project into compliance with the requirements of the Law respecting the safety of dams
- Ensure the integrity of the reservoir.

(Slide #12: major points)

- Limit the material losses that might result from floods
- Ensure the protection of the environment.

THE PROCESS OF COMMUNICATION AND DIALOGUE:

In order to better acquaint itself with the opinion of the community and to take this into account in designing the project, Hydro-Québec held several information and consultation meetings between May 1999 and December 2000.

These meetings permitted the expression of a variety of concerns; Hydro Québec intends to respond to these by setting up a project follow-up committee with the community.

(Slide #13: concerns)

More specifically, the following concerns were raised:

The possible impact of the upgrading work on tourism and leisure activities and their development.
To respond to this concern,

Particular importance was attached to:

1. The inter-shore link that the parties involved have depended on for several years to ensure access to certain attractions.

(Slide #14: concerns)

2. The project for prolonging the Témiscamingue linear park.
3. The repercussions of the work on the Marmites-de-Géants and to the trails leading there.

As for the inter-shore link, Hydro-Québec wants to repeat its assurance that it will be able to be used on a permanent basis following the work. It will be reserved exclusively for cyclists and cross-country skiers, that is, the clientele of the linear park.

Finally, access to Marmites-de-Géants will be maintained

(Slide #15: concerns)

Other concerns were voiced; these include:

- The completion of the La Régionale hydroelectric generating station project; and

(Slide #16: concerns)

- The possibility of a negative impact of lowering the water level in the Petit réservoir des Quinze.

As for the La Régionale project, le Petit réservoir will not be raised. Consequently, there will be no impact on the hydraulic head at the Angliers dam.

As for the negative impact of a drop in water level in the Petit réservoir des Quinze, Hydro-Québec wishes to repeat that this drop will not be lower than the authorized minimum level.

Nevertheless, agreements have been reached with the Angliers municipality in order to provide water in the event of water supply difficulties.

As for the Des Quinze fish farm, it possesses a means of measuring water levels supplied by Hydro-Québec. A communication mechanism established with the Head of the Outaouais power generating stations will permit any developments in the situation to be detected at all times.

Hydro-Québec has taken the concerns of the community into consideration and has proposed solutions. Furthermore, we wish to point out the favourable reception given to the measures proposed by the three municipalities involved.

I now pass you over to my colleague Benoit Gagnon, who is in charge of the environmental studies for the project.

ENVIRONMENTAL IMPACT AND ALLEVIATING MEASURES:

Thank you
The project we are concerned with today is a low impact project, the impact being primarily limited to the work phase.

Physical Environment
As regards the environmental impact, certain modifications to the physical surroundings are anticipated:

(Slide #17: figure 2.3 of the project proposal)

- The upgrading of the rockfill dam will necessitate a temporary lowering of the water level in the Petit reservoir des Quinze to 60 cm less than the maximal operating level for a period of two to three months, preferably in the fall, if all the required authorizations are obtained.

As a particular alleviating measure, Hydro-Québec is going to ensure that, in accordance with the circumstances, everything necessary will be done to ensure that the activities of those using the bodies of water are not disrupted.

- The quality of the water will be temporarily affected, for example, during the tree clearing, excavation and dry fill activities. However, these activities will be concentrated on the sites of the rockfill dam and the dike at lac Long. Water filling activities are planned at lac Talé, but these will be carried out with rocky materials that are unlikely to alter the quality of the water.

  The upgrading of the downstream slope of the dam will be carried out entirely on dry land, that is, above the average level of the Outaouis river's springtime high. This activity will have only a minor effect on the quality of the water.

In general terms, the following alleviating measures have been planned to minimize the impact on the water:

1. For fills in water courses, use of the smallest possible amount of materials containing fine particles likely to cause turbidity
2. Use of vehicles and worksite equipment in perfect working order
3. All necessary precautions will be taken to avoid spills of fuel or contaminants.

Biological Environment

Certain impacts on the biological environment are anticipated; these include:

Land vegetation

- There will be a loss of approximately four hectares of forest habitat, mainly as a result of:
  ⇒ the rehabilitation of a former road, to provide access to the dikes; and
  ⇒ the clearing and stripping of borrow banks and quarries.

  During the construction activities, the wildlife habitat will be temporarily disturbed.

  As an alleviating measure we plan to:

  1. Restrict tree clearing to the most necessary areas;

  2. Dispose of the excavated material in a dump site, and

  3. Reforest the affected areas.

Fish

Only the work for improving and raising the level of the main dam and dikes risks disturbing the aquatic environment.

- In the small réservoir des Quinze, the only known spawning area is situated at the foot of the Angliers dam. It is primarily home to walleye pike and chub.

  Otherwise, the environment affected by the work is unfavorable to fish because of the poor quality of the substratum.

  The disturbances will be temporary and the new rockfill will offer more openings to provide shelter for young fish and small species.

- The raising and widening of the lac Talé dike may temporarily disturb the aquatic environment. Likewise, on the downstream side, the widening of the dike could impact slightly on the flood plain at the base of the facility.

(Slide # 18a et 18 b: cross-section of a dike, figure 8 of summary – berm covering semi-aquatic vegetation)

In order to make up for lost habitat, we will attempt to carry out a plan that will improve the quality and diversity of the habitat of lac Talé. The construction of a shoal at the foot of the dike will bring about an improvement in the location as a place for the growth of small fish, through the creation of shallow zones. This shoal will permit the introduction of herbaceous and aquatic river vegetation suitable as a spawning ground in a floodplain (pike, perch, etc.) as well as a location for rearing fry and small fish.

(Slide #19: map of *human and natural environments)*

- The raising of the lac Long dike will primarily take place on the downstream side. At the base of the dike, there will be a stretch of isolated water surrounded by forest that is little conducive to fish. The work will have no impact on their habitat

Human environment

In terms of the human environment, the impacts are very few in number and are mostly restricted to the construction period.

- With regard to the use of the territory, the use of the sites adjoining the dam is limited to the use of one of the paths leading to the Marmites-de-Géants.

  The paths situated downstream from the dam will remain accessible during the work.

- As for the use of the bodies of water, the municipality of Angliers gets its water downstream from the Angliers dam. The speckled trout farm situated downstream from Angliers has cages located on the left bank of the reservoir. These two users

could be affected if the level of the Petit reservoir des Quinze fell below the minimum operating level.

As mentioned previously, Hydro-Québec has issued assurances that, in accordance with circumstances, the necessary steps will be taken so as not to disturb the activities of these two users.

The work and subsequent operation of the facilities will have very little effect on the use of the water for leisure and tourism purposes. During the summer months, lakes Long and Talé attract few fishermen, and there are no chalets or major residences in the immediate vicinity of the dikes. Also, the use of the reservoir for leisure and tourist purposes is concentrated on the approaches to the Angliers dam.

- Finally the quality of life of the inhabitants of the project zone will be affected very little. The worksite adjoining the rockfill dam will be situated about four km from the village of Angliers. The environmental nuisance caused by the work will be relatively minor. We should mention above all the heavy traffic, the increase in noise and disturbances due to traffic, primarily caused by the transportation of materials and the coming and going all of worksite machinery and heavy vehicles.

  The primary alleviating measures planned are:

  1. An information program
  2. A work schedule
  3. A system of road signs;
  4. The spreading of dust control liquid, and
  5. The rehabilitation of a 2-km stretch of Highway 391 (in the event of damage).

Positive spinoffs from the project

The completion of the project will lead to relatively major economic benefits at both the local and regional levels. Furthermore, a community organization, COMAXTEM, has been duly mandated to act as liaison between the general contractors and resources in the community.

A large part of the expenses will be linked to non-specialized jobs and to the provision of services. The spinoffs will affect the entire Témiscamingue CRM.

(Slide #20: benefits)

- The direct benefits will be the creation of jobs as well as the assignment of contracts to local and regional enterprises. In this regard, I should emphasize that a clause encouraging local subcontracting will be added to the calls for tenders.

- A considerable number of positions could be filled by workers from the region.

(Slide #21 : benefits)

- The companies will purchase certain materials on site and may need subcontractors for transporting materials and for the excavation work.

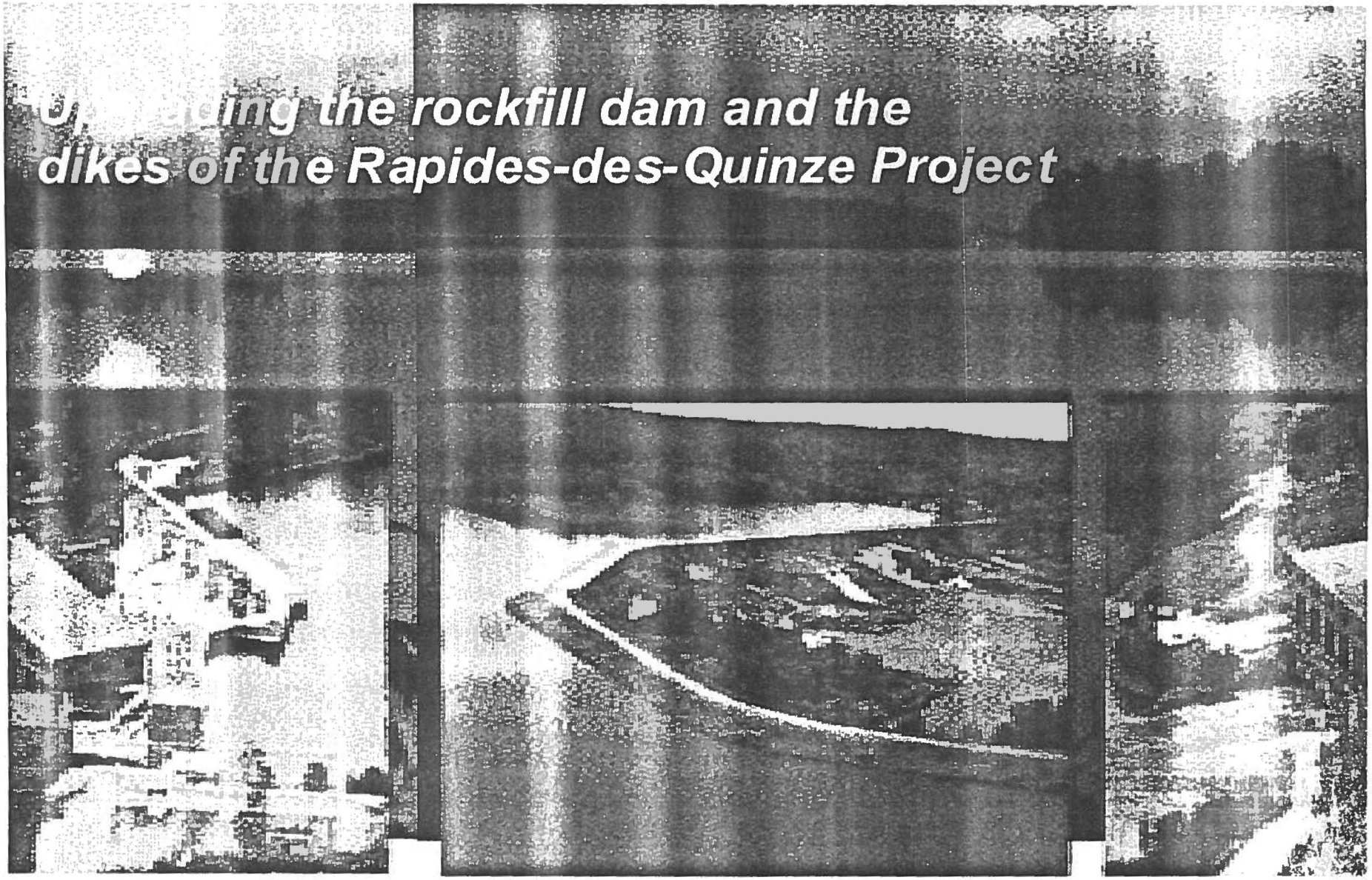
(Slide #22: benefits)

In conclusion, I want to emphasize once more that the purpose of the upgrading work is to:

- Ensure the safety of the public and of property at the maximal probable flood, thereby bringing the project into compliance with the requirements of the Law respecting the safety of dams
- Preserve the integrity of the reservoir;
- Limit any material losses that might be brought about by flooding and
- Ensure the protection of the environment.

Furthermore the flexible measures set in place at the rockfill dam will allow it to be used as an inter-shore link for the purposes of recreation and tourism.

Thank you very much!


Building the rockfill dam and the
dikes of the Rapides-des-Quinze Project

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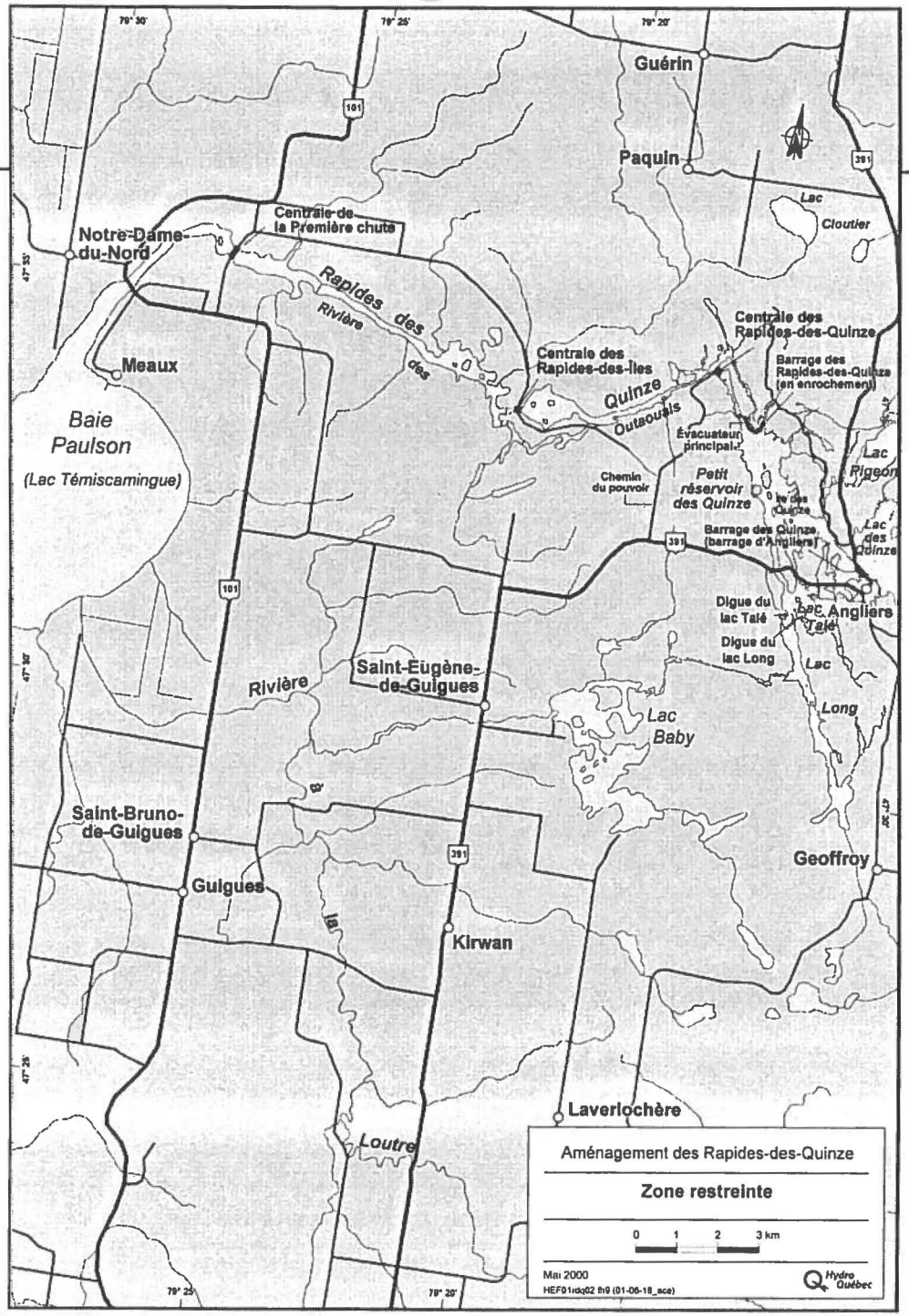
PRESENTATION

- The nature of the project and its rationale
- The process of communication and dialogue with the community, aimed at taking the latter 's concerns into consideration
- Environmental impacts and alleviating measures, and
- Benefits of the project.

Hydro Québec



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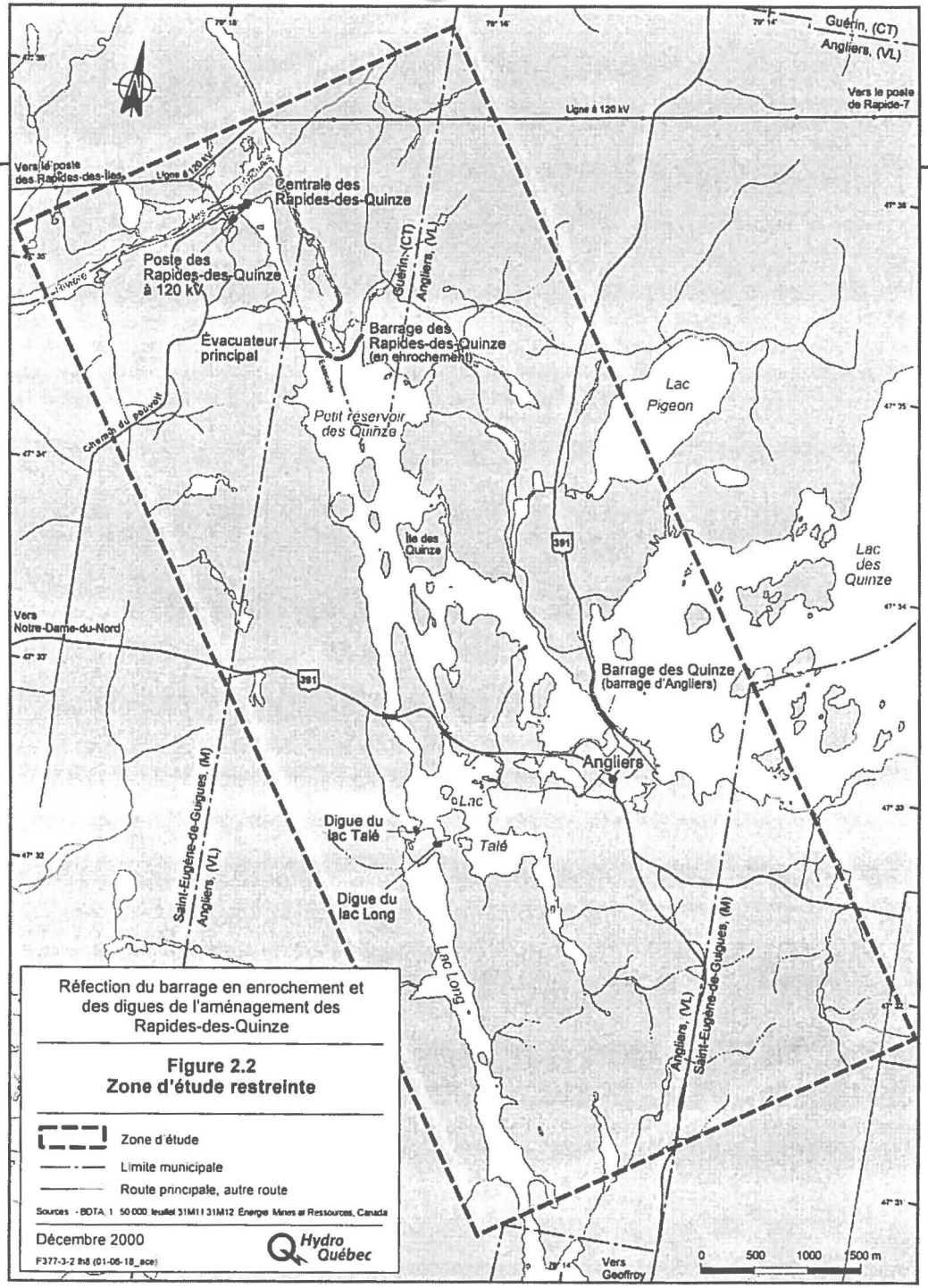

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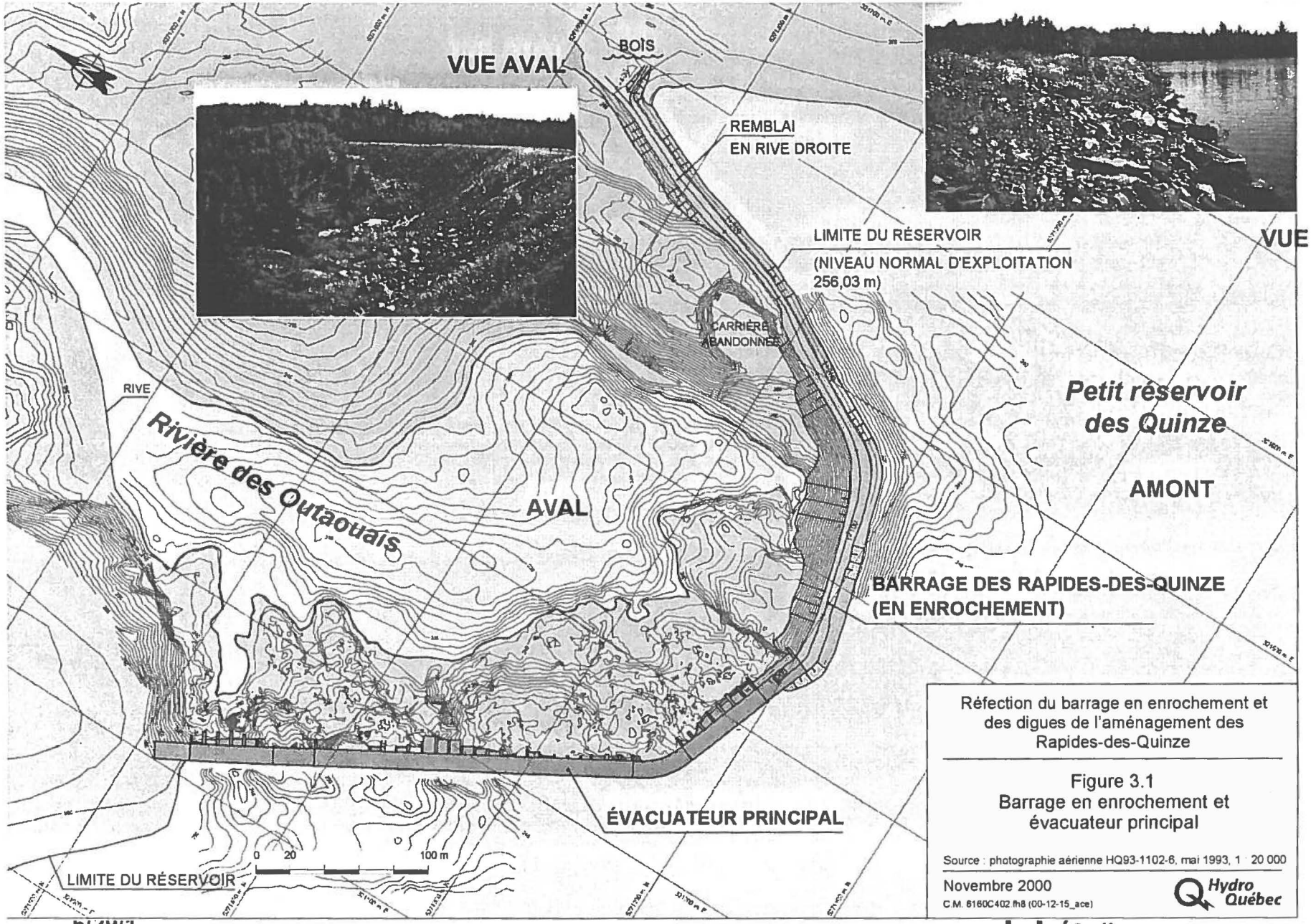

Réfection du barrage en enrochement et des digues de l'aménagement des Rapides-des-Quinze

Figure 3.1
Barrage en enrochement et évacuateur principal

Source : photographie aérienne HQ93-1102-6, mai 1993, 1 : 20 000

Novembre 2000
C.M. 8160C402.fh8 (00-12-15_ace)

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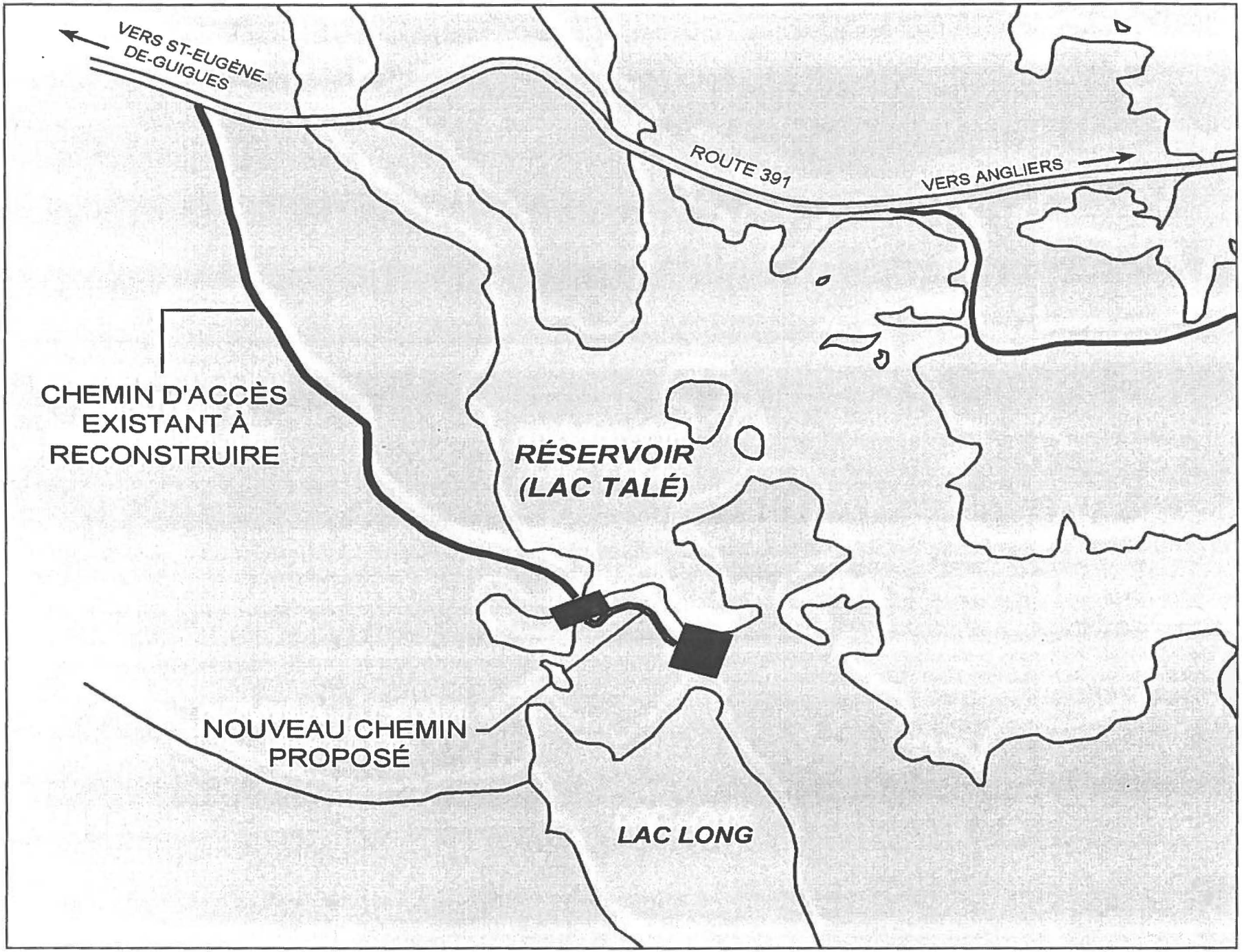
VERS ST-EUGÈNE-DE-GUIGUES
ROUTE 391
VERS ANGLIERS
CHEMIN D'ACCÈS EXISTANT À RECONSTRUIRE
RÉSERVOIR (LAC TALÉ)
NOUVEAU CHEMIN PROPOSÉ
LAC LONG

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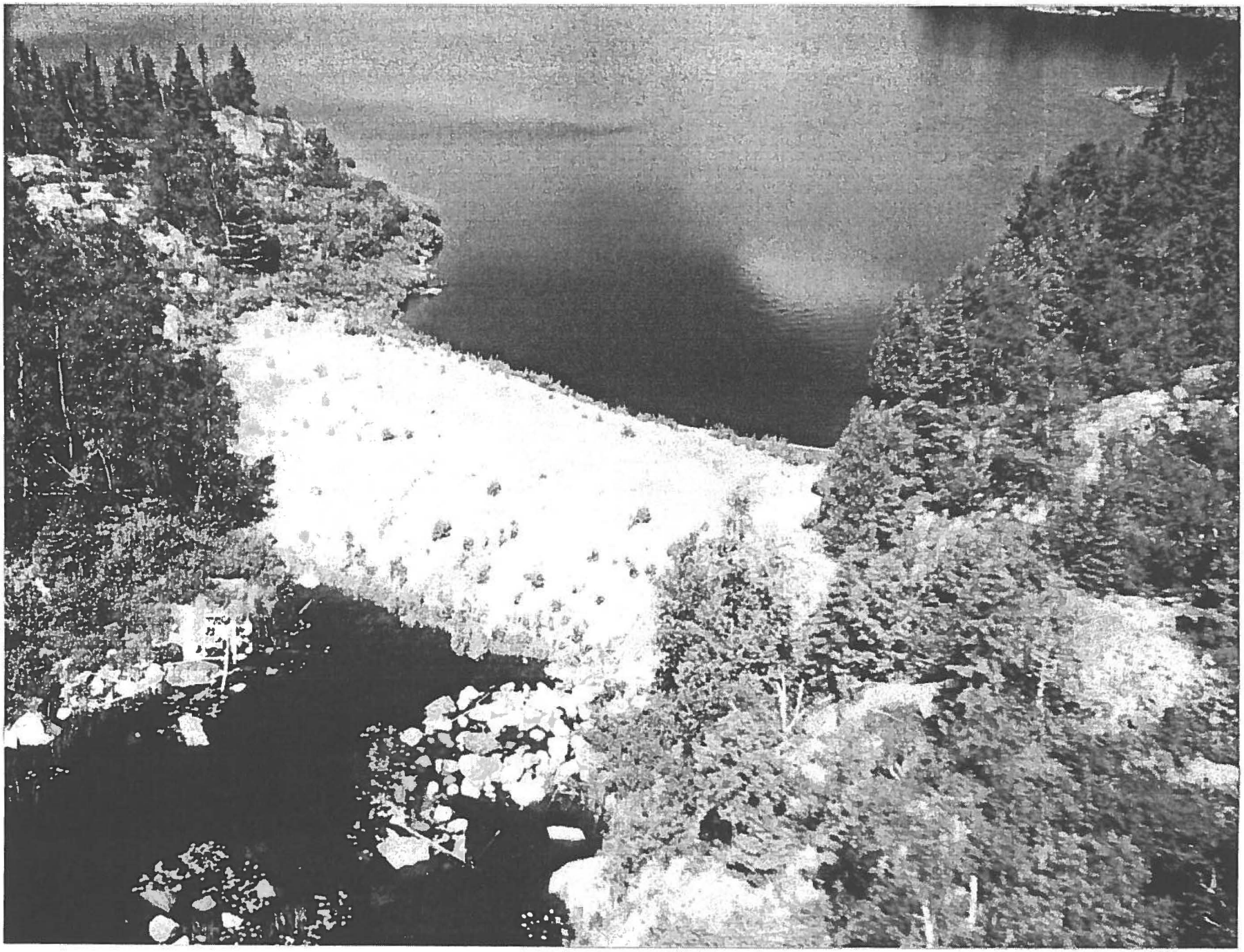

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RATIONALE

- To ensure the safety of the public and property at maximum probable flood, thereby bringing the Project into compliance with the requirements of the Law respecting the safety of dams

- To ensure the integrity of the reservoir

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RATIONALE (cont'd)

- To limit the material losses that might result from floods
- To ensure the protection of the environment.

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CONCERNS

Impact	Alleviating measures
Possible impact of the work on tourist and leisure activities, and on their development	Hydro-Québec will set up a project follow-up committee in consultation with the community

An inter-shore link providing access to certain attractions	The inter-shore link could be used on a permanent basis after the project is completed

Hydro Québec

CONCERNS (cont 'd)

Impact	Alleviating measures
Plan to prolong the Témiscamingue Linear Park	The inter-shore link will be reserved exclusively for cyclists and cross-country skiers (the clientele of the linear park), and will connect the Rivière Des Quinze sector to the linear park
Repercussions of the work on the Marmites-de-Géants and on the paths leading to it	Access is maintained

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CONCERNS (cont 'd)

Impact	Alleviating measures
Completion of the La Régionale generating station project	The Petit réservoir will not be raised; consequently there will be no impact on the hydraulic head at the Angliers dam

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CONCERNS (cont 'd)

Impact	Aleviating measures
Possibility of a negative impact in terms of a drop in water level at the Petit réservoir des Quinze	• The Petit réservoir des Quinze will not undergo a drop in water level below the minimum authorized level • Hydro-Québec has reached an agreement with the municipality of Angliers to provide water in the event of difficulties with the municipal water supply • The Des Quinze fish farm has an instrument for measuring water levels provided by Hydro-Québec, and • A telephone link with the Head of the Outaouais power generating stations will permit any developments in the situation to be detected at all times

Hydro Québec

IMPACT: PHYSICAL ENVIRONMENT

Impact	Alleviating measures
A drop in level for about 3 months of the Petit réservoir des Quinze of 60 cm lower than the maximal operating level	Special measures undertaken to ensure that the activities of users of the bodies of water are not adversely affected

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IMPACT: PHYSICAL ENVIRONMENT (cont'd)

Impact	Alleviating measures
Temporary alteration of the quality of the water in the vicinity of the work during excavation and filling operations	For filling operations in water courses, use the smallest possible amount of materials that could contain fine particles likely to cause turbidity Use only vehicles and worksite machinery in perfect working order that present no danger of oil spills Take all steps necessary to avoid spills of fuel or contaminants.

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IMPACT: BIOLOGICAL ENVIRONMENT

Impact	Alleviating measures
Loss of approximately four hectares of forest habitat and small areas of river vegetation	1. Restrict tree clearing and disruption to vegetation to the most necessary areas 2. Deposit unreused excavated material in a dump site situated close to the generating station 3. At the end of the work, promote the rapid re-establishment of the plant cover through reforestation and other means.

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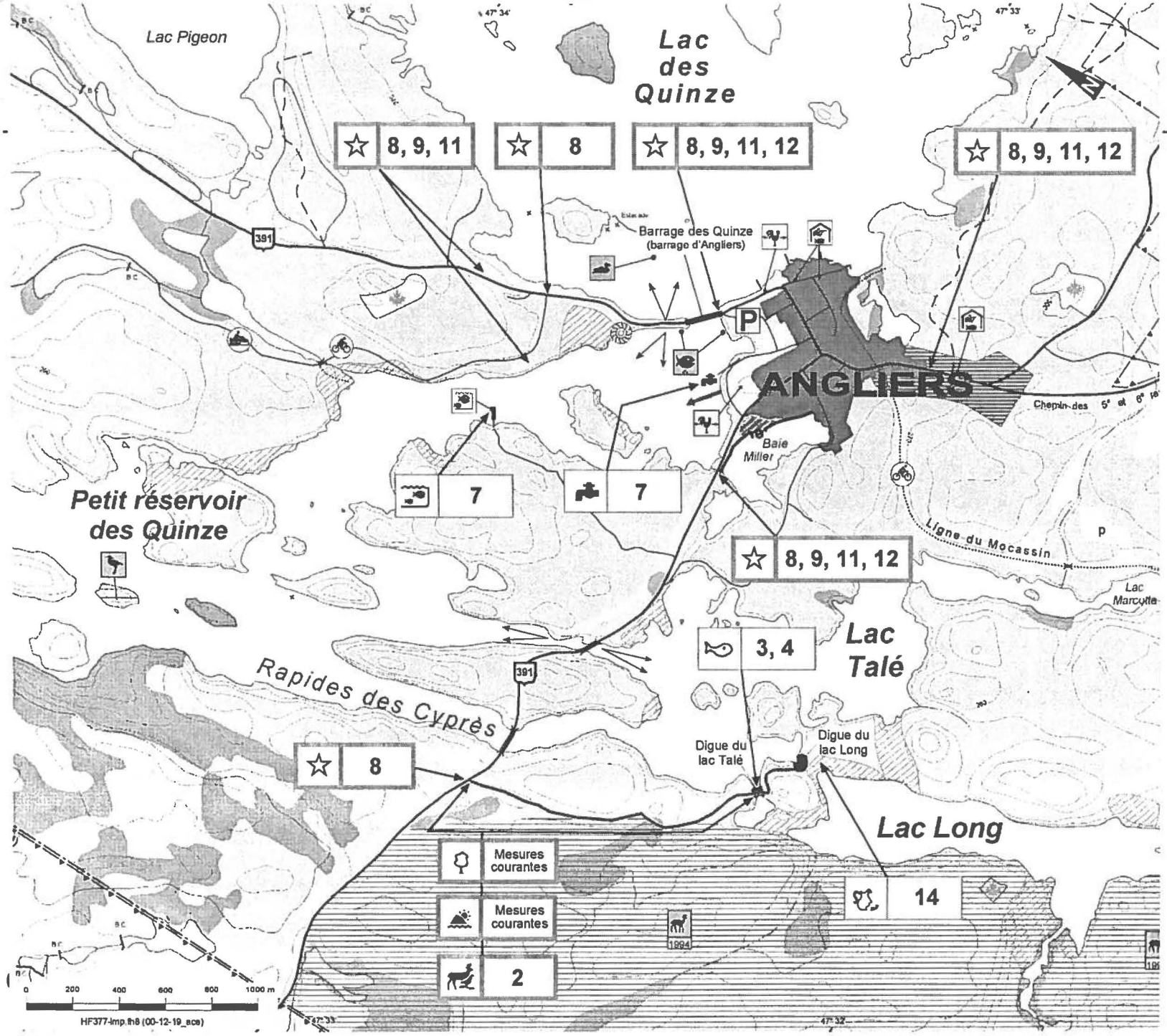
Lac Pigeon
Lac des Quinze
☆ 8, 9, 11
☆ 8
☆ 8, 9, 11, 12
☆ 8, 9, 11, 12
391
Barrage des Quinze (barrage d'Angliers)
P
ANGLIERS
Chemin des 5e et 6e rg
Baie Miller
7
7
Petit réservoir des Quinze
Ligne du Mocassin
☆ 8, 9, 11, 12
Lac Marcotte
3, 4
Lac Talé
Rapides des Cyprès
391
☆ 8
Digue du lac Talé
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Mesures courantes
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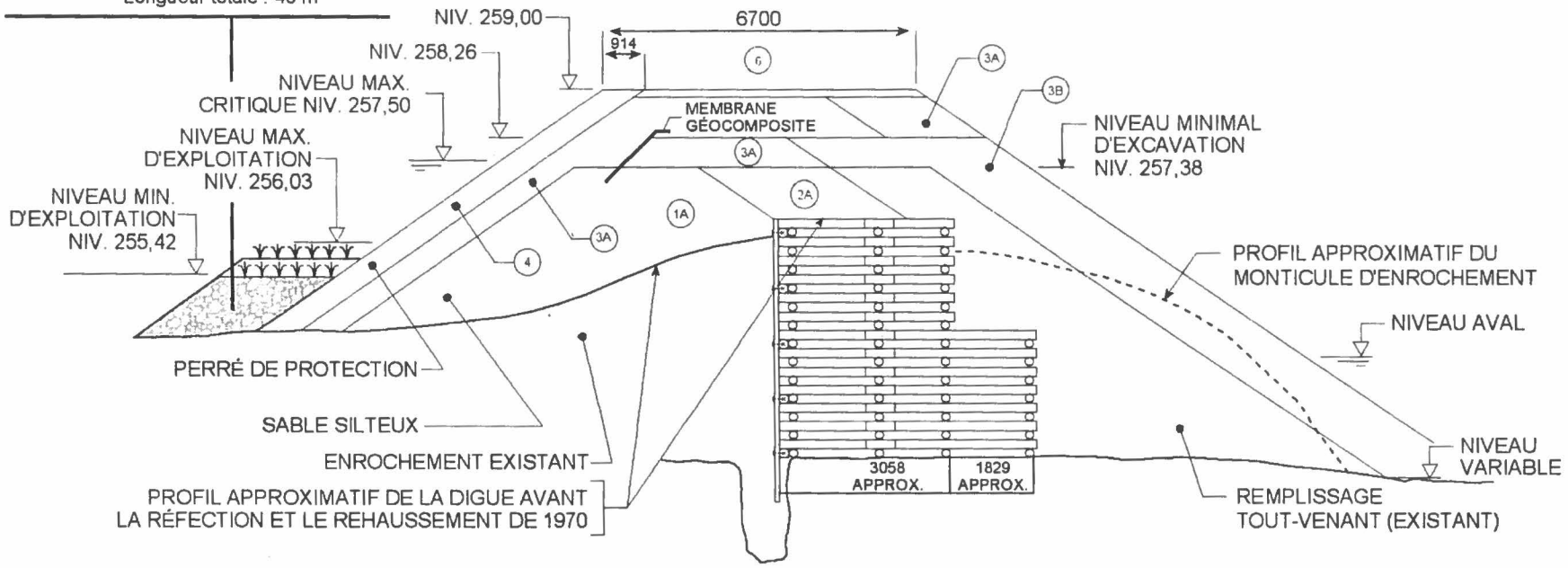
1 berme abritant une végétation semi-aquatique

- cote : – rive : 255,70 m
  – centre : 255,40 m
- ensemencement naturel
- 20 cm de substrat organique recouvert d'une membrane de paillis :
  – Largeur : 2,5 m
  – Longueur totale : 40 m

COUPE A-A
À TRAVERS LA DIGUE RDQD-5 (LAC TALÉ)



1A	Sable silteux déjà en place	3B	Enrochement tout-venant
2A	Sable et gravier compacté	4	Enrochement sélectionné pour perré
3A	Enrochement traité compacté (max. 225 mm)	6	Couche de roulement pierre concassée (max. 25 mm)

HR6160C412.fh8 (00-12-21)

Réfection du barrage en enrochement et des digues de l'aménagement des Rapides-des-Quinze

Figure 6.2
Vue en coupe de la digue du lac Talé et mesures de compensation pour l'habitat du poisson

Novembre 2000

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IMPACT: BIOLOGICAL ENVIRONMENT (cont'd)

Impact	Alleviating measures
Loss of aquatic habitat upstream from the lac Talé dike	Construct a shoal upstream from the lac Talé dike, to promote the regrowth of river vegetation

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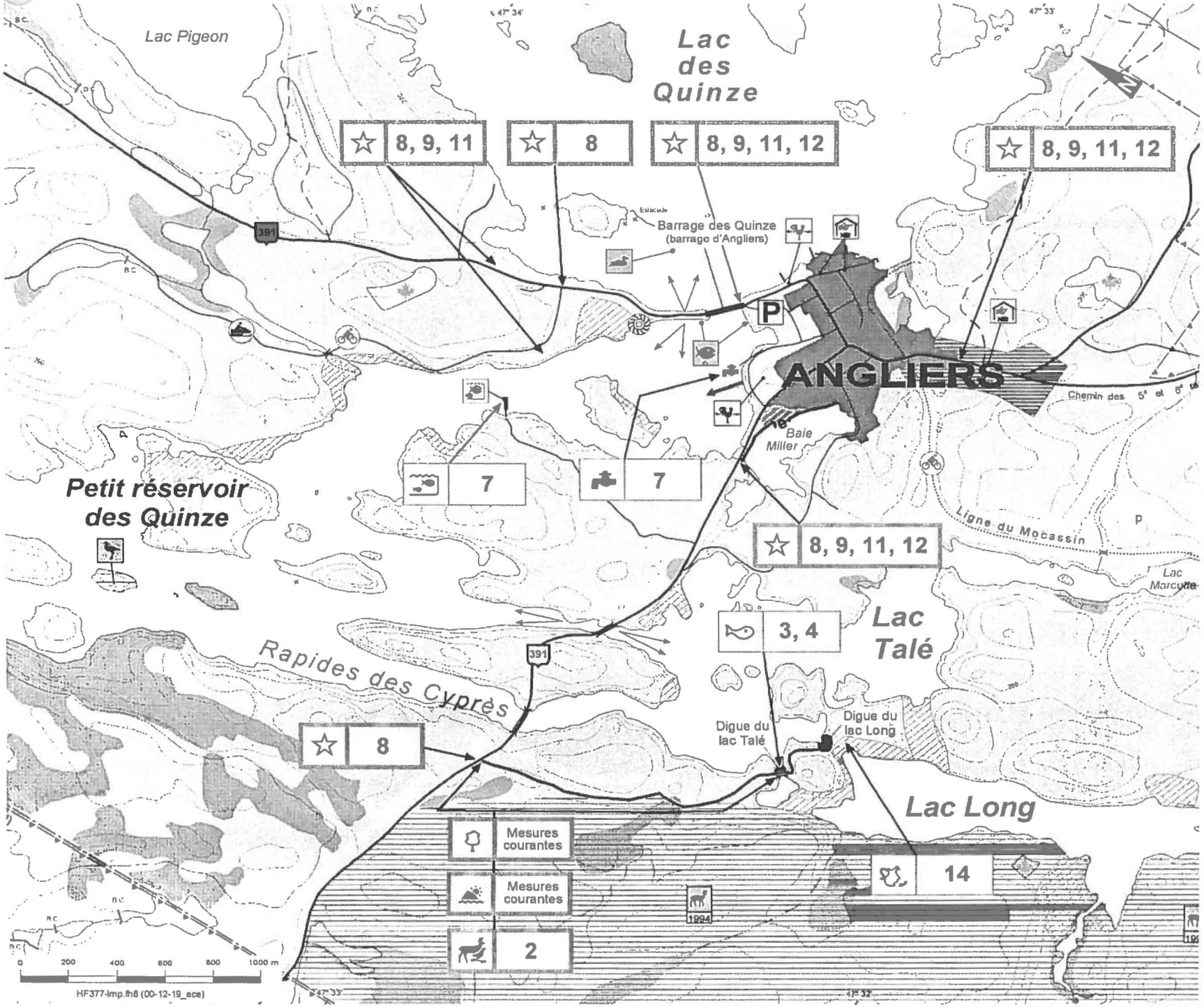
Lac Pigeon
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Barrage des Quinze (barrage d'Angliers)
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ANGLIERS
Chemin des 5e et 6e rg
Baie Miller
7
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Petit réservoir des Quinze
Ligne du Mocassin
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Digue du lac Talé
Digue du lac Long
Lac Long
Mesures courantes
Mesures courantes
2
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IMPACT: HUMAN ENVIRONMENT

Impact	Alleviating measures
Utilisation of the territory	Little impact, but a commitment to reach understanding with users of the path on the right shore of the dam on the best way to hinder its use as little as possible

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IMPACT: HUMAN ENVIRONMENT (cont'd)

Impact	Alleviating measures
Use of the bodies of water	In accordance with circumstances, necessary steps will be taken to ensure that the activities of the users of the bodies of water are not disturbed.

IMPACT: HUMAN ENVIRONMENT (cont'd)

Impact	Alleviating measures
Quality of life	Set up an information program for the population of Angliers for the duration of the work Establish a work schedule aimed at reducing environmental nuisance Ensure that the drivers of transport vehicles keep the use of compression brakes to a minimum Set up a sytem of road signs indicating constraints imposed by the work

Hydro Québec

IMPACT: MILIEU HUMAIN (suite)

Impact	Alleviating measures
Quality of life (cont'd)	Spread a dust-control liquid each time the work produces dust likely to be harmful to health, safety or well-being, or damaging to the environment and property and Rehabilitate the stretch of Highway 391 that runs through Angliers, if this sustains any damage as a result of the work.

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BENEFITS

- Direct benefits will be primarily in the form of the award of contracts to local and regional companies, aided by a clause encouraging sub-contracting within the region.

BENEFITS (cont'd)

- A large number of positions could be filled by workers from the region.

BENEFITS (cont'd)

- Companies will purchase certain materials locally and may have recourse to sub-contractors for transporting materials and excavation work.

Hydro Québec

BENEFITS (cont'd)

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- **IN CONCLUSION, WE WOULD LIKE TO REMIND YOU THAT THE AIMS OF THE PROJECT ARE TO:**

BENEFITS (cont'd)

- Ensure the safety of the public and of property at the maximal probable flood, thereby bringing the Project in compliance with the requirements of the Law respecting the safety of dams
- Ensure the integrity of the reservoir

BENEFITS (cont'd)

- Limit the material losses that might result from floods
- Ensure the protection of the environment.

BENEFITS (cont'd)

- Finally, the flexible measures set in place at the rockfill dam will allow it to be used as an inter-shore link for the purposes of recreational and tourism activities.