

Room 569, Fifth Floor,
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IN THE MATTER OF

The Lakes and Rivers Improvement Act;

AND IN THE MATTER OF

The proposed refusal of the application of Guy I. Fiddes for approval for the location of a dam on Sharpes Creek on Lot 3 in Concessions IV of the Township of Colborne in the County of Huron.

REPORT TO THE MINISTER OF NATURAL RESOURCES

Pursuant to an appointment of the Honourable Frank S. Miller, Minister of Natural Resources, dated the 18th day of August, 1977 the undersigned has conducted an inquiry as to whether the proposed refusal of an application of Guy I. Fiddes, hereinafter referred to as "the applicant", for the approval of the location of a dam on Sharpes Creek in Lot 3 in Concession IV in the Township of Colborne in the County of Huron was fair, sound and reasonably necessary for the achievement of the purposes of The Lakes and Rivers Improvement Act.

A hearing in the matter was held on October 28, 1977 at Toronto. The Honourable K. Laird appeared on behalf of the applicant. Ms. E. Goldberg of the Ministry of the Attorney General appeared on behalf of the Ministry of Natural Resources. Kenneth John Hazlitt, an adjacent owner appeared and was made a party to the proceedings. In addition Gary Davidson, the Director of Planning for the Corporation of the County of Huron appeared and the corporation was made a party.

Sharpes Creek is a tributary of the Maitland River. It rises in the Saratoga Swamp and flows in a southerly direction joining the Maitland River at the community of Benmiller. This confluence is in Concession II of the township. The applicant owns the southeast quarter of Lot 3 in Concession IV containing approximately fifty acres. This location is approximately one mile north of the confluence. The evidence indicates that there is a further ten or fifteen miles of stream above the applicant's property.

Thirty acres of the applicant's land is workable and the balance is stream and bush. The applicant acquired this site as a

retirement home. He presently is employed at the Stelco plant in Hamilton and he is developing the land for his residence on his retirement. The creek enters his land at the north boundary, flows through the land and leaves the land at the south boundary which is the first concession road north of Benmiller. On February 5, 1974 the Ministry of the Environment issued a permit to take water under section 37 of The Ontario Water Resources Act to the applicant and pursuant to this permit the applicant excavated a pond approximately one and one-half acres in area and eight feet in depth. His proposal was to create a trout pond for his use and the use of his friends and the purpose of the permit was to enable him to have a bypass pond taking water from the creek above his pond and returning it to the creek. The submission of his counsel was that he proceeded with the construction of his pond on the strength of the permit from the Ministry of the Environment and that subsequently the Ministry of Natural Resources objected on the grounds of noncompliance with The Lakes and Rivers Improvement Act. However, it may be noted that the application for approval to construct a bypass pond was dated the 18th day of December, 1973 which is approximately two months prior to the date of the issue of the permit under The Ontario Water Resources Act.

The application contained drawings of the proposed outlet from the creek and the applicant's evidence was that he had obtained these drawings from the Ministry of Natural Resources. The evidence did not disclose the date of construction of the existing pond. This aspect of the matter may not be relevant with regard to the merits of the case other than to reflect on the argument that consideration ought to be given to the granting of the permit under The Ontario Water Resources Act in considering this matter. I will say no more on this subject other than to comment that I find it difficult to understand the position that the applicant proceeded with the construction on the strength of the permit under The Ontario Water Resources Act without knowledge of the requirement of complying with The Lakes and Rivers Improvement Act, if he had on the 18th day of December, 1973, prior to obtaining the issue of a permit to take water applied for

approval under The Lakes and Rivers Improvement Act.

The applicant's case was supported by two expert witnesses. Firstly, Gordon Lloyd Barfoot, a professional engineer who has done post graduate studies in oceanography, lymnology and meteorology at the University of British Columbia and at Waterloo University and who has had significant experience in related matters including a one-year study on the impact of the Lennox Generating Station regarding the effect of the heating of natural bodies of water, gave evidence on behalf of the applicant. He made a study of the information made available by the Ministry and his notes were filed as Exhibit 4. His conclusion was that taking the worst possible case that had been projected by the material of the Minister i.e. a temperature of 71.6 degrees Fahrenheit or 22 degrees Celsius and applying a fairly rigid regime under which only four per cent of the flow of the river would be diverted through the bypass, the change in temperature would be one-tenths of a degree Celsius. Not only did his calculation include the maximum temperature of the water of the stream but he also assumed that the pond surface temperature was the same as the air temperature which reflected in his opinion the worst possible condition. As indicated his calculations were based on a very strict regime which involved the taking of only four per cent of the flow of the stream during sever conditions. Further his calculations were based on a depth or eight feet. This appears to be the measurement of the depth of the pond following its excavation.

Secondly, Frederick E. J. Fry, Professor Emeritus of Zoology of the University of Toronto who has taught and studied fish in Ontario since 1933 was called on behalf of the applicant. His evidence was that based on the findings of the witness Barfoot there would be a negligible change in the environment for brook trout and the proposal would cause no interference with the life of brook trout in Sharpes Creek.

During cross-examination this witness indicated that the proposed pond might be helpful to the fish populations and improve the existing habitat. He pointed out that the evidence indicates that the habitat is very poor at the headwaters and at the lower end of the

creek, with the quality area being in the central part of the creek. He pointed out that the significant function of a bypass pond occurs in the winter and prevents oxygen deficiency. The functioning of the diversion can be controlled in the extreme situations of summer and the benefit will come from new water being added to the stream which would not otherwise be there. This new source of water is water from the natural water table that would flow into the pond and be added to the streams

Kenneth John Hazlitt owns land to the west and to the south of the applicant's property. His concern was that the spoil from the excavation of the pond had been levelled to the westerly boundary of the applicant's property and in so doing the elevation of the applicant's land was raised by a distance of one to two feet. The natural drainage is easterly towards the river and in the spring this embankment caused flooding of Hazlitt's land. He produced photographs showing such flooding to have occurred since the excavation of the pond. Secondly, Hazlitt's property is serviced by a private drainage system and he was concerned that the installation of a weir or some other device in the water to control the bypass would raise the water level and prevent the operation of the outlets of the drainage system.

The evidence of the applicant indicated that Hazlitt had also constructed a dug pond on his property and that the spoil from the excavation equally contributed to the flooding. The applicant's position was that he had consulted with the Ministry of Agriculture and food and that he had made adjustments to his property which should have been adequate to take care of any drainage problems. It seems that there is a dispute between these two parties that fall within either the common law or the The Drainage Act and Hazlitt indicated that he was making an application to have his drainage system brought under The Drainage Act. I can only assume that these problems will be dealt with under the appropriate legislation. In passing I might comment that it does not appear to me that problems of flooding caused by fill from dug ponds is a matter within the contemplation of The Lakes and Rivers Improvement Act. Dug ponds are not lakes or rivers or streams and while in this particular case the pond may become part of

the diversion in the event it is completed, by themselves excavated ponds would not fall within the jurisdiction of the The Lakes and Rivers Improvement Act. While Hazlitt may be the riparian owner in respect of the downstream property he is not a riparian owner in respect of Sharpes Creek at the location in question and in my opinion his concerns are outside of the ambit of The Lakes and Rivers Improvement Act. Before leaving this subject I might point out that the witness Barfoot indicated that the proposed pond could be of assistance in a drainage scheme and here again these matters that ought to be considered by the tribunal dealing with drainage matters.

On behalf of the County of Huron Mr. Davidson presented the official plan of the county and a secondary plan of the Township of Colborne. He referred to page 19 of the county plan which reads as follows:

“(3) Greenbelt

Lands designated “Greenbelt” are intended primarily for preservation and conservation of the natural environment. This category includes all lands having inherent environmental hazards, such as, poor drainage, organic soils, flood susceptibility, erosion, steep slopes or any other physical conditions which leads to the deterioration of the environment. Such uses as agriculture, outdoor recreation, nursery gardening, forestry and the conservation of soil or wildlife shall be permitted provided they do not lead to the deterioration or degradation of the environment.

In areas where there is a Conservation Authority having jurisdiction over the following matters neither buildings nor the placing nor the removal of fill of any kind, whether originating on the site or elsewhere, shall be permitted in areas subject to periodic flooding or physical limitations of any kind without the written consent of the local Conservation Authority having jurisdiction in the areas”

He also referred me to a number of provisions on page 4 of the township secondary plan which read as follows:

“4. Natural Environment

.....
.....

A major intent of this Plan is to

protect and re-establish areas of natural environment. These areas of natural environment include the Lake Huron shoreline and lake bank corridor, the Maitland River system, Sharp's Creeks and the several creeks flowing into Lake Huron, marsh and wetland areas and the larger remaining forested areas. The intent goes further than just the protection of these environmentally sensitive areas and recommends the re-establishment of the natural environment in certain areas.

.....

c) Goals

The following Natural Environment goals are adopted:

- i) to identify those areas of Natural Environment which are of significance to the Township or region
- ii) to conserve and protect areas of Natural environment and prevent further deterioration through wise management and use
- iii) to re-establish natural environments in critical areas
- iv) to provide a habitat for wildlife and aquatic life
- v) to preserve the natural beauty of the township
- vi) to heighten public awareness and stewardship of the natural environment and develop incentives for private landowners to retain and maintain the natural environment.
- vii) to increase communication and cooperation between private landowners of the natural environment, the public and the Ministry of Natural Resources and the Maitland Conservation Authority so as to achieve high standards of conservation practices.

d) Policies

To achieve these goals three major policy areas covering protection, re-establishment and management are adopted.

Protection

- i)
- ii)
- iii) uses and structures will be permitted only in conformance with the zoning by-law and permanent structures will not be permitted without the written consent of the Maitland Valley Conservation Authority.”

The concern of the township and the county was that they did not wish to permit any activity which would create a degradation of the lands in a natural environment zone of which Sharpes Creek is an example. They were concerned as to their future position in the event applications were made to them and the witness indicated that in effect his position was that he was holding a watching brief and was not prepared to submit any evidence that the proposal of the applicant would be a degradation to the natural environment of the area.

A number of witnesses were called on behalf of the Ministry. Dan Mansell, the District Manager for the Wingham Administrative District, who has had extensive experience in the administration of fish and wildlife matters, outlined the practices in respect of The Lakes and Rivers Improvement Act. His evidence was that the creek was sixteen miles in length notwithstanding a figure of ten miles shown in the Ministry's inspection report in respect of "Distance to headwater". The watershed is eighteen square miles in area. The stream is well vegetated along its source in the Saratoga swamp. It meanders through farmland to Benmiller reflecting a low decline in elevations. In the province's classification of streams the stream has been classed as a cold water stream. Such a stream has a maximum summer temperature of 68 degrees Fahrenheit.

With reference to the history of cold water streams the witness indicated that the cold water streams in Ontario have decreased by eighty to ninety per cent since the turn of the century. These streams are fast disappearing. Dams have raised the temperature of the waters of streams. Twenty-seven per cent of the dams studied show an increase in water temperature. Where there is a series of dams there is an acceleration in the increase in temperature. In studies in Durham and Northumberland it was noted that there was an increase of 18 degrees Fahrenheit per mile resulting from dam construction.

For the purpose of long-term objectives the province has classified streams in Southern Ontario into three zones. Zone I

contains cold water streams and the policy is to prohibit the construction of dams. In Zone 2 the streams have higher temperatures, usually above 68 degrees and the policy is to permit bypass ponds rather than dams. The remainder of the part of the province is classed as Zone 3 and each application is regarded on its merits.

The part of Ontario in which Sharpes Creek is situate is classified as Zone 1. On receipt of the applicant's application the application was considered by the Fish and Wildlife officials as well as the officials of the Field Services Branch. Following consultation with the professional biologists it was decided to recommend that the application be refused. The witness pointed out that the reason for rejecting the application was found in the third purpose set out in the purposes of The Lakes and Rivers Improvement Act as found in section 1a of that Act. Their concerns were the effect of the proposal on the habitat and the effect on fisheries recreation. Brook trout are a special type of fish and provide a specific type of fishing recreation. There was some concern in respect of the fourth purpose i.e. natural amenities and in this regard the opinion of the district was that there is a unique type of habitat which requires a long-term protective policy. There are few streams of this category in this district. The channel is scenic and adds to the quality of the environment. The district was also concerned with the precedent arising from the granting of approval of a dam and its precedential effects in respect of subsequent applications that may be made. He also expressed concern that if approved there might be future problems of management of the dam and the need for ministerial interference in respect of orders to control the operation of the dam.

He stated that the stream is changing and if the purposes of the Act are to be met, in his opinion it was essential to refuse the application for approval of the location of the proposed dam.

He also indicated that in his evaluation of such matters there is a need to use the most critical criteria and that the worst possible situation should be assumed in coming to a conclusion.

On cross-examination with reference to the issue of precedent reference was made to a dam a Benmiller. It was pointed

out that in the management of the species the dam at Benmiller played a significant role. This dam creates a barrier to the migration of rainbow trout and preserves the habitat above the dam for the exclusive use of brook trout which would suffer in the event they were required to compete with rainbow trout for the available habitat and food.

The second witness for the Ministry was Peter Harold Crook, the Regional Engineer for the Southwestern Region of the Ministry. This witness is a civil engineer who worked with the Ministry of Transportation and Communications until four years ago. Since that time he has been engaged in the review and approval of plans of water control structures under The Lakes and Rivers Improvement Act. He received the application in August, 1975. He made an assessment of the effect of the proposal and using assumptions of two six inch pipes for the inlet, the scanty information of the application, the fact that the proposed intake pipe appeared to be near the surface of the water of the stream resulting in a calculated inlet quantity of twenty thousand gallons per hour which would involve a change in the waters of the pond on a four day basis, he concluded that on a dry summer day when the air temperature would approximate 80 degrees Fahrenheit there would be an increase in temperature throughout the pond of 2.5 degrees centigrade or 5 degrees Fahrenheit. He calculated the effect on the downstream portion of the river and concluded that the estimated capacity of 20,000 gallons per hour would utilize one-third of the summer flow of the stream and would result in a net temperature increase downstream of 1 degree Celsius or 2 degrees Fahrenheit.

He also calculated that there would be a twelve inch loss of water in the pond due to evaporation during a summer which would be a very small proportion of the flow. He was also concerned that there was a possibility of siltation resulting from the spoil from the banks of the pond although he had no particular knowledge with regard to the specific case. This comment was based on generality. With reference to the report of the witness Barfoot he pointed out that his calculations were based on a temperature that was 6.6 degrees higher than

the temperature upon which his calculations were based, i.e. an inlet temperature of 65 degrees Fahrenheit. He also pointed out that his calculations were based on a level in the pond of 5.7 feet while Barfoot's calculations were based on a depth of 8 feet. He also pointed out that Barfoot's calculations were based on a small percentage of the flow i.e. 4 per cent while his calculations were based on a 33 per cent utilization of the flow through the diversion. He pointed out that the application failed to disclose any proposal to use devices which would permit a regime such as Barfoot was applying in his calculations.

Rene Norman Jones, the District Biologist who has been in the district for approximately five years, indicated that Sharpes Creek was the only creek in the district of its nature and in his opinion should be treated as an endangered species. The creek is unique in that it contains a natural population of brook trout that has never been affected by stocking. As evidenced by the 1973 stream survey, the trout in the stream are of all ages and are thriving. He indicated that the Ministry was concerned regarding the special population of brook trout and produced the following chart respecting the temperatures on the creek at three stations, the first station being at Benmiller, the second station being upstream of the Fiddes property and the third station being in the headwaters:

<u>Year</u>	<u>Station 1</u>	<u>Station 2</u>	<u>Station 3</u>
1973	17 (62.6)	17 (62.6)	23 (73.4)
1974	17 (62.6)	14 (57.2)	17 (62.6)
1975	18 (64.4)	15 (59)	22 (71.6)
1976	20 (68)	14 (57.2)	19 (66.2)
1977	18 (64.4)	15 (59)	21 (69.8)
5 year average	18 (64.4)	15 (59)	20.4 (68.72)

He also produced a printout from a computer program of the Ministry of the Environment which showed the following water temperatures taken at the road allowance at the south boundary of the Fiddes property. This station was maintained during 1976 and the temperatures in centigrade on the following dates were as follows:

January 1 - 1	June 8 - 19
February 10 - 2	July 20 - 22
April 4 - 9	August 11 - 20
May 4 - 10	September 13 - 18

He also produced evidence of the stream flows in cubic meters per second with gallons per minute to the nearest 100 shown in brackets as follows:

<u>Year</u>	<u>Station 1</u>	<u>Station 2</u>	<u>Station 3</u>
1973	.715 (9,400)	.36 (4,700)	.06 (800)
1974	.53 (7,000)	.27 (3,600)	.08 (1,100)
1975	.67 (8,800)	.33 (4,400)	.05 (700)
1976	1.10 (14,500)	.50 (6,600)	.09 (1,200)
1977	1.38 (18,200)	.21 (2,700)	.03 (400)
5 year average	.08 (1,200)	.34 (4,400)	.06 (800)

The witness indicated that the significance of water temperature on brook trout is that species distribution depends on water temperature. References were made to articles by Professor Fry, Scott and Crossman and an unidentified study of United States origin which indicates that the optimum temperature for brook trout is 15.5 degrees centigrade and that at 18.8 degrees centigrade there is a zero net growth. These studies were based on work done at the National Water Quality Laboratory in Minnesota. The witness's conclusion was the Sharpes Creek is reaching the upper limits for the continuance of the existing level of production and that a difference in temperature of one or two degrees would create a significant effect on the stream. He admitted that it was not a matter of survival of the existing trout but that the concern was the continuation of the existing population at its present quality. He indicated that the matter of evaporation was not significant.

The witness also pointed out that brook trout have a territorial nature. If a portion of a stream becomes unsatisfactory as habitat the fish move into other areas upsetting the stream balance.

The witness indicated that there were other concerns in connection with the proposal. He was concerned that brook trout might be planted in the pond which could escape into the stream spreading disease and could also change the gene pool of the natural population which exists in the stream. He was also concerned regarding the escape of viruses or bacterial disease through the water regardless of the escape of fish. The witness also indicated that he expected that in very warm periods there would be an algae problem in the pond and that the owner himself would be requiring advice on the control of algae. He would undoubtedly wish to use a chemical control which could escape and effect the biological community downstream. He indicated that he would not accept an argument that these matters could be adequately guarded against.

With regard to the matter of purchase of fish from the hatchery it appeared that while the applicant had at one time understood he could acquire fish from the Ministry for this purpose the policy no longer applies.

Douglas P. Dodge, Ph.D., the Supervisor of the Environmental Dynamics Section of the Fisheries Branch of the Ministry, gave further evidence on the establishment of the zones adopted by the Ministry adding that in the Zone 1 areas the policy is to protect and to enhance the habitat.

The witness indicated that the optimum temperature for brook trout is 15 degrees centigrade. This is the temperature at which an animal succeeds best in growth and general health. If this temperature is exceeded the population is subject to stress. This temperature converts to 59 degrees Fahrenheit. If the temperature of the creek is 65 degrees Fahrenheit, an increased temperature of 2 degrees Fahrenheit puts some stress on the fish population. If the basic temperature was 70 or 71 degrees an increase of 2 degrees Fahrenheit would in his opinion constitute a significant stress on the population.

The witness indicated that he was familiar with the American study which had been filed and he stated that the number of brook trout streams in Ontario has been sadly depleted since the turn of the century resulting from the "mismanagement" of land and the construction of roads and buildings which affected habitat. He indicated that there is far less habitat than there was fifty years ago and that it is essential that steps be taken to protect the existing habitat. The policy of the Ministry is not only to produce fishing opportunities but to maintain the existing natural brook trout. The significance of the protection of the specific populations is their genetic significance and the innateness of the habitat in which they are found.

I have already dealt with a number of matters raised by the applicant in his reexamination. One point that was not mentioned was a statement that he had intention of constructing a weir in the creek. I might say at this time that as I understand the engineering aspects of the matter it is not possible for the bypass pond to operate on the basis of the sketches that accompanied the application which were said to have been provided by the Ministry of Natural Resources. It is my understanding that it would be necessary in the event a bypass system were installed to have some controlling device which would collect the waters and divert it into the bypass. Firstly, it is obvious that if a pipe measuring one foot in diameter were inserted in a stream that were fifteen feet in width it would be most impossible for one-quarter or one-third as was estimated by the witness Crooks of the stream to be diverted through the pipe. Secondly, the opening of the pipe if merely inserted in the stream would fill with silt and would not operate. Accordingly, the system contemplated by the applicant in this matter may be significantly more sophisticated than the applicant appreciates, particularly if he adopts the position taken by his expert witness of inserting controlling devices which would restrict the flow in extreme periods.

The witness Barfoot was recalled and he gave evidence that the addition of the pond should assist the drainage schemes in the area by providing a second outlet. He also stated that if in the extreme situation he had based his calculations on a utilization of

one-third of the flow of the creek rather than four per cent, there would, by reason of the shorter period of retention in the pond, be a reduced heat increase which would have the result that there would be no ground for saying that there would be any significant increase in the temperature of the water of the creek below the outlet.

The submissions of Hazlitt and the county have been dealt with.

The submission on behalf of the applicant was basically that the matter turns on the evidence of the expert witnesses and that it is a matter of determining which expert witness's evidence ought to be accepted. He also relied on the issue of the permit by the Ministry of the Environment and I have already dealt with this matter.

The submissions on behalf of the Ministry were that the significant matter ought to be the consideration of Sharpes Creek. Emphasis was placed on the uniqueness of the creek both in respect of the part of Ontario in which it is situate and the class of population of brook trout inhabiting the creek. It was submitted that the evidence clearly established that there would be an increase of 1 degree centigrade in the temperatures of the creek below the return outlet. In this regard it was pointed out that the calculations of the Ministry were based on the application and that the calculations of the witness Barfoot were based on assumptions which he had made regarding control devices which the applicant may not have any intention or ability to install. More significantly such devices were not part of the application. It was submitted that the temperatures used in his calculations were lower than those determined by the Ministries of Natural Resources and the Environment in their actual surveys. Also emphasis was placed on the possibility of spreading disease and chemicals into the existing stream.

With reference to the evidence of the engineers respecting temperature increase I do not believe that the submission regarding temperatures outlined in the immediately preceding paragraph was established by the evidence. The maximum reading recorded by the Ministry of the Environment was 22 degrees Celsius and this converts to 71.1 degrees Fahrenheit. As I understand the evidence of the

witness Barfoot, he made a calculation based on this temperature and with a restricted utilization of the flow of the creek to the extent of four per cent and concluded there would only be a .1 degree Celsius increase in temperature. Not only did Barfoot calculate the heat increase at this temperature, but he also calculated it at stream temperatures of 65 degrees Fahrenheit. According to his notes that were filed, he showed, at a stream temperature of 65 degrees, a calculated increase in temperature of .17 degrees Fahrenheit in the downstream temperatures. It is apparent from his conclusions that there was an increased temperature in the outflow from the pond but this is reduced with the mixing of the outlet flows with the flows of the creek.

On the other hand the witness Crook only calculated the temperature increase at 65 degrees Fahrenheit and concluded that there would be an increase in pond temperature of 3 degrees Fahrenheit and in the downstream temperature of 2 degrees Fahrenheit. It may be noted that while his conclusion relates to the crucial temperature, i.e. temperatures are 19 degrees Celsius to 22 degrees Celsius during the months of June, July and August which are in excess of the optimum temperature of 59 degrees Fahrenheit, which converts to 15 degrees Celsius and the crucial temperature.

If one were merely to assess the qualifications of the two witnesses one would have to lean towards the witness Barfoot by reason of his specialized academic and practical experience. In addition, his notes included calculations at a variety of temperatures which include the temperature used by the witness Crook. There was some difference in the basis of their calculations in that Barfoot's calculations were based on a depth of eight feet which may be more accurate than the depth of five and seven-tenths feet that was used by Crook and was the depth shown in the application. There was no evidence to help me with the significance of this depth variation or to permit me to conclude that the variation was the reason for the different results. The witness Crook cannot be faulted for using the data provided in the application.

In my opinion the decision on the approval of the location of the proposed dam should not turn on the issue of the acceptability of either of the engineering calculations of heat increase but rather on the evidence of the recorded temperature of Sharpes Creek at the location in question and the significance of this evidence. By way of background it may be noted that both the witnesses Jones and Dodge adopted the temperature of 59 degrees Fahrenheit or 15 degrees Celsius as the optimum temperature for brook trout. At temperatures of 18.8 degrees Celsius, i.e. 66 degrees Fahrenheit, according to the article entitled Water Quality Criteria there is a zero net growth of this species. According to the article by Scott and Crossman, Exhibit 17, brook trout tend to seek temperatures below 68 degrees Fahrenheit or 20 degrees Celsius. At p.212 of that article it is stated,

“Brook trout occur in clear, cool, well oxygenated streams and lakes. They tend to seek temperatures below 68 degrees F (20 degrees C) when surface waters warm up.

----In streams and rivers brook trout move downstream to larger bodies of water when temperatures rise and may move completely out of the river system into lake or sea-“

In addition, the experiments referred to by Professor Fry in his article, Exhibit 16, indicate a lethal temperature of 22 degrees Celsius, depending upon the acclimation. It is also noted that the evidence of the witnesses for the Ministry was that the basis for classification of a stream as Zone 1 was a maximum temperature of 68 degrees Fahrenheit. Although the extremities of Sharpes Creek exceed these temperatures, the entire creek has been included in Zone 1. It is noted in this regard that the temperatures recorded by the Ministry of the Environment at the south end of the Fiddes property exceed the temperatures taken by the Ministry of Natural Resources at Station 2 which is north of the Fiddes property and even exceed the temperatures taken by the Ministry of Natural Resources at Benmiller, the maximum temperature shown at Benmiller being 20 degrees Celsius and at Station 2 being 17 degrees Celsius. It appears to the undersigned that the portion of the creek on the Fiddes property is, without the connection of the bypass pond, downstream of the useful portion of the creek and that at this location the temperatures are such that the increase, if any, in extreme period. will not affect the

brook trout as, the temperatures are in excess of the optimum temperature and the temperature at which migration occurs and on occasion reach a level that in some circumstances is lethal. It must be kept in mind that the temperatures recorded by the Ministry of the Environment were the result of a systematic monitoring while the temperatures listed by the Ministry of Natural Resources were not identified as to the date on which the temperature was taken and there is no evidence as to whether each annual temperature was a mean temperature or an isolated reading. Accordingly, the temperatures taken by the Ministry of the Environment would appear to be more representative of overall conditions. If one were to apply the principles of the literature in the light of the recorded temperatures, it seems unlikely that brook trout would inhabit these lower reaches of the creek during the summer months and that the utility of the lower reaches cannot be considered to have the significance alleged by the witnesses for the Ministry. Accordingly I doubt that there is any suitable habitat for brook trout during the summer months in these lower reaches of the creek and that it follows that, assuming that there would be an increase in temperature during such months, the proposed bypass pond would not affect the management or perpetuation of brook trout as, in the course of nature, the species would have migrated from the area. It would follow that there is no reason to refuse approval of the location of the proposed dam on the basis of increased temperature.

I am not unmindful of the evidence of the witness, Dodge, to the effect that the policy of the Ministry was not only to protect but also to enhance fish habitat. I was not shown any basis on which enhancement is the responsibility of the landowners. Subsection 3 of section 6 of The Game and Fish Act, R.S.O. 1970 c. 186 provides that the Minister of Natural Resources or the Minister of Government Services may enter into agreements with the owners of lands respecting the management of lands for the purposes of management, perpetuation and rehabilitation of wildlife resources. It would seem that if there is a public interest in enhancement of habitat, the vehicle is an agreement under this subsection and there was no evidence to indicate

