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Prepared by:

André Côté, Senior Evaluation Manager
and
Nancy Byam, Audit Project Officer

With the collaboration of :

Auguste Solutions & Associates Inc.

Housing Initiative Demonstration Projects

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Executive Summary

Background

The Innovative Housing Initiative was introduced in 1994-1995 by the former minister to help First Nations find ways to address the demand for on-reserve housing and to integrate new approaches into their existing housing programs. The initiative was based on the premise that increasing the use of local materials and labour would result in cost savings and increase the local impact of housing projects. At first, log housing was the preferred means of achieving these objectives.

Proposals from First Nations were initially assessed against four basic criteria: to build five houses at a maximum cost of $50,000 per house (including all services and electrical connections) use local logs or timber, employ local labour including individuals on social assistance and meet National Building Code standards. Two of these criteria were later revised. The use of local material other than logs was allowed and the cost per house was permitted to exceed $50,000. However, DIAND subsidy was not increased and all costs in excess of the $50,000 per house were the responsibility of the participating First Nation.

From the many proposals submitted by First Nations, the department selected five communities: Big Trout Lake, Sandy Lake, and Wasauksing (Ontario), Kitigan Zibi Anishinabeg (Quebec) and Tsuu T'ina (Alberta).

Scope, Objective and Methodology

The evaluation was conducted in accordance with the terms of reference approved by the Assistant Deputy Minister of the Socio-Economic Policy and Programming and Program Redesign, and endorsed by the Departmental Audit and Evaluation Committee. The main issues were: the success of the initiative in helping First Nations to address their housing needs, its impacts, the barriers that were encountered and how they were resolved; the lessons learned; and how these lessons could be built on to support the implementation of the new on-reserve housing policy.

The evaluation comprised the five communities who undertook a pilot project as part of the initiative. It examined how the pilot projects were implemented in each of the communities, including project management, and how the reporting and accountability mechanisms to the communities and the department worked. The evaluation did not review the Department of Indian Affairs and Northern Development (DIAND) on-reserve housing policy nor did it review the First Nations housing policies or programs. All five pilot projects were visited to collect detailed information on the evaluation issues and questions from the perspective of each community. During these visits, interviews took place with relevant First Nations political and administrative officials, and in some cases with construction workers and contractors. The visits also involved observations of the houses and discussions with owners or tenants. Telephone and

in-person interviews took place with regional and headquarters officials. Reviews of departmental files were also performed at headquarters. The evaluation received excellent cooperation from the First Nation communities and departmental officials.

Evaluation Findings

Success of the Initiative in Addressing Housing Needs. The pilot projects resulted in a total of twenty-two new houses in the five communities that participated. Three of the five communities used logs found on their own land and a fourth community imported logs from another province. Three communities made significant use of local labour, including social assistance recipients. The other two communities made a moderate and a little use of local labour. The cost of the houses varied widely, partially as a result of the communities understanding of the initiative's objective regarding cost and differences in how infrastructure costs were accounted for. The communities estimate the final cost of each house from $50,000 to $250,000. The actual cost-effectiveness of the houses would need to be assessed over the long term.

Impacts of the Initiative. Two of the five communities have identified approaches to help address a part of their housing needs. These communities continue to use the techniques and practices developed during the pilot project. Consequently, additional employment is also available to community members. In two other communities, the project had limited impact beyond the construction of the five houses. In the fifth community, the project was not completed as planned due to a number of financial and other difficulties.

Barriers encountered and their resolution. The project's intent of using local resources and labour created some practical problems. Three of the four communities who used logs for construction of the houses experienced difficulties in obtaining adequate logs as well as some construction problems. Sometimes these problems were further compounded by a lack of specialized skilled labour. In most cases technical problems were dealt with as they developed and solutions were found. However, the problems have had impacts on construction costs and on the quality of the houses built.

Lessons Learned. There are lessons regarding the initiative's effectiveness in using local labour and resources productively and demonstrating alternative solutions to First Nation's housing problems. Two First Nations have found techniques which they have used again. However, other conditions were present and facilitated these positive results. Among these condition are well articulated community housing policy, good project management, involvement of the owners in the process, including financial commitment, and the purchase of outside expertise.

The initiative also demonstrated the need to have access to outside help and build on past experience. As well, the decision to undertake a pilot type of project where new concepts are being tested needs to be made in the context of a community's environment. Some communities are better suited than others to undertake a particular project. The department should have established clear and stable selection criteria for the initiative. First Nations would have been in a better position to assess whether the initiative was suited to their needs and whether they met the criteria.

Lessons that Support the New On-Reserve Housing Policy. The pilot projects demonstrated that communities which have clearly stated housing policy supported by a strong project management capability are more susceptible to integrate innovative or new ways of doing things. The initiative demonstrated that innovative ideas supported by technical competence can result in solutions that, within a specified budget, can increase the spin-off of housing construction, including employment opportunities.

Section 1 - Introduction

Purpose of the Report

This report outlines the results of an evaluation of the Department of Indian Affairs and Northern Development (DIAND) First Nations Innovative Housing Initiative. It is divided in three sections. Section one contains the introduction, section two presents the evaluation issues, scope, approach and methodology, and section three discusses the findings of the evaluation.

Purpose of the Evaluation

The evaluation fulfills the department's commitment to evaluate the initiative in order that the experience gained by participating First Nations could be shared with other First Nations to help them address their housing needs. The evaluation focussed on the results and impacts of the pilot projects undertaken as part of the initiative and on how the lessons learned from these projects can be used in the implementation of the current housing policy.

The First Nations Innovative Housing Initiative

The Innovative Housing Initiative was introduced in 1994-1995 to help First Nations find new ways to address the demand for housing and integrate these new approaches to their existing housing programs. The initiative was to develop alternatives capable of complementing existing methods for constructing houses on reserves and demonstrate that there are cost-conscious ways to address on-reserve housing shortage. The favoured means was to increase the use of local material and labour in order to keep costs down.

Initially, the initiative was to involve log housing demonstration projects. The former minister had indicated a special interest in log housing as a potentially cost effective means of addressing a part of the housing needs of Aboriginal communities. Applicants were required to provide a cost breakdown identifying funding sources, details on the construction process, project schedule, and training and project supervision. The proposals had to meet four basic conditions. Build five houses at a maximum cost of $50,000 per house, including all services and electrical connections (for a maximum contribution of $250,000 per project, over-and-above the level of funding for the community's regular housing program). The construction had to employ local work force, including individuals on social assistance, use local logs or timber, and comply with the National Building Code standards. Some of these conditions were later relaxed. In particular, the cost per house could exceed $50,000 but this amount was the maximum provided by DIAND, and the local logs could be substituted for logs or other material coming from other First Nations or for other local resources, such as sand and gravel.

Each of the proposals received was reviewed by officials to ensure that it met the program criteria applicable at that time, as indicated above. From the many proposals submitted, four communities in Quebec (Kitigan Zibi Anishinabeg) and Ontario (Big Trout Lake, Sandy Lake and Wasauksing) were selected to develop a log housing project. A fifth community in Alberta (Tsuu T'ina) was also selected to develop a housing project using sand and gravel which was locally available.

Section 2 - Evaluation Issues, Scope, Approach and Methodology

Issues

The evaluation was conducted in accordance with the terms of reference approved by the Assistant Deputy Minister Corporate Services and endorsed by the Departmental Audit and Evaluation Committee (DAEC) in October 1997. The main issues defined in these terms of reference are: the success of the initiative in helping First Nations to address their housing needs; the impacts of the initiative; the barriers that were encountered and how they were resolved; the lessons learned; and how the lessons learned can be built on to support the implementation of the new on-reserve housing policy. A copy of the Terms of Reference is found in appendix 1.

Scope

The evaluation was conducted in the five First Nation communities who undertook a pilot project as part of the initiative. The pilot projects were examined to determine how they were implemented in each of the communities, including project management and reporting / accountability mechanisms to the communities and to the department. It included a review of the costs of constructing the houses in each of the communities, and how costs over and above the $50,000 per unit allocation were funded. The evaluation considered the extent of use of local resources and the effects that the use of local labour has had on employment. It assessed if there were any barriers encountered and how these were dealt with. The evaluation did not review DIAND's on-reserve housing policy nor did it review the First Nations housing policies or programs.

Approach and Methodology

This evaluation is the result of a cooperative effort. The Departmental Audit and Evaluation Branch (DAEB) managed the evaluation and worked in cooperation with a consulting firm to gather the information and evidence needed to address the evaluation issues and questions. All five pilot projects were visited and telephone and/or in-person interviews took place with regional and headquarters officials. The evaluation received excellent cooperation from the First Nation communities and departmental officials.

The evaluation utilized the following three main lines of evidence.

Case Studies. Each of the five communities were visited. The purpose of each 2-3 day visit was to collect detailed information on the evaluation issues and questions from the perspective of the community. During these visits, interviews took place with First Nations political and administrative officials, and in some cases with construction workers and contractors. Information was gathered on the houses constructed, the process for constructing the houses, the cost effectiveness of the pilot projects and the impacts of the initiative. The visits also involved observations of the houses and discussions with owners or tenants. A case study report was drafted for each of the five communities and shared with the First Nation, and the regional office, in order to validate its content.

Interviews with DIAND officials. Interviews were conducted in person with DIAND officials at headquarters and by telephone with regional officials. These interviews provided an overview of the project management at the departmental level.

File Reviews. Basic records on each of the pilot projects and on the general administration of the initiative were reviewed to collect information and guide the interviews with departmental and First Nations officials. The evaluation did not request access to records at First Nations level.

Section 3 - Evaluation Findings

The evaluation findings are presented in two parts. Part I contains a description and analysis of the results of each pilot project. It highlights the varied results achieved by each First Nation. Part II addresses the evaluation findings against the evaluation issues and questions.

Part I: Results of Pilot Projects

Each pilot project had different characteristics and achieved varied results. These variations can be attributed to the unique situation of each participating First Nation, the approaches developed and the creative solutions found by some of them.

Big Trout Lake

Big Trout Lake First Nation is an isolated community approximately 440 kilometres northeast of Sioux Lookout, Ontario. As of May 1995, there were 880 residents living in the community. There is no permanent all-weather road to the community. However, it is accessible by air year-round and by a winter road system usually available from January to April each year.

Most Big Trout Lake houses are old and need substantial repairs. There is a housing shortage in the community. The construction of five new houses would help ease the community's housing shortage and assist the economy by stimulating the local logging industry. The site selected for the new constructions was some distance from the existing community and did not have infrastructure services.

In its project proposal, the Big Trout Lake First Nation planned to construct five log houses at a cost of $63,700 per house. All the houses were to maximize the amount of local materials used and employ local labour. The design incorporated a traditional log construction technique blended with built-in heating and water systems and included the use of high-grade insulation products. The houses were designed for small families with a total living area of 784 square feet and would remain the property of the community. However, the future tenants would play an active role in the construction of their homes and would participate in at least one area of construction. This involvement would help increase their awareness of the effort required to build and properly maintain a house. In addition, the project would employ young community members and social assistance recipients providing them with an opportunity to develop practical skills. The band council received $68,500 from the Sioux Lookout Area Aboriginal Management Board (SLAAMB) towards the cost of employing social assistance recipients and training workers in log house construction.

Chief and council had overall responsibility for the project and the community's housing manager acted as the project coordinator. The services of an engineering firm were retained to provide a suitable design for the log houses. A formal training program including one week of classroom instruction was provided to the local employees.

As a result of the innovative housing initiative, Big Trout Lake constructed four log houses and one house using conventional construction methods. The First Nation estimates the final cost of each log house at $105,000. The costs of the log houses were $41,300 higher than planned because the original budget estimates did not include all costs, notably that of infrastructure work and the cost to air-freight some of the building materials. The comparable cost for a stud-framed house at Big Trout Lake is between $80,000 and $90,000.

Figure 1: The four log houses built at Big Trout Lake used a combination of vertical and horizontal logs.

All workers, with the exception of the person in charge of training for the log construction program, were Big Trout Lake Band members, with the majority of the workers being social assistance recipients.

The construction faced several problems. The project was delayed in starting, and the winter roads could not be utilized. Local logs were used but they were not of the right size as the First Nation was only able to obtain logs which were 30 to 50 percent smaller in diameter than was initially planned. The use of the smaller logs significantly increased the volume of work and also resulted in an insulation value of the logs of less than half of Canada Mortgage and Housing Corporation's (CMHC) minimum requirements.

This required the addition of interior insulated stud-framed walls behind the exterior log walls so as to meet CMHC's insulation standards, which contributed to further increase the costs of the houses.

This pilot project does not demonstrate that log housing is a practical and economical option to address the housing needs of the Big Trout Lake community. The project was successful in building four of the five houses according to the criteria established for the initiative, but at a higher cost than planned. However, a number of technical issues, largely related to the lack of suitable logs, were not entirely overcome and contributed to push the construction costs to a non-economical level.

Kitigan Zibi Anishinabeg

Kitigan Zibi Anishinabeg is located near Maniwaki Quebec, about 140 kilometres north of Ottawa. As of June 1995 there were 2,135 registered members with 1,300 people living on-reserve. There are about 450 houses on the reserve, most of which have been constructed in the last 20 years. The owners of the homes have certificates of possession and none of the houses are community owned.

At the time of the initiative, there were a number of members in the process of moving back to the reserve and the innovative housing initiative was viewed as an opportunity to help fill a housing void. The initiative was also viewed as a way to promote job creation, innovative construction techniques, and economic development. The band council submitted a proposal to build five houses using local logs and some local labour for a portion of the work. The proposal also included plans for a formal training program for log house construction.

The Band Council did not undertake the innovative pilot project as a low-cost housing initiative, it estimated the average cost to complete a log house at $89,000. Since the amount provided by DIAND was at $50,000 per house, the owners were required to make up the difference. The selection of the future home owners included an assessment of their capacity to fulfill mortgage requirements. The owners could borrow up to $20,000 from the First Nation's revolving loan fund and could also contribute by working at the construction of their house. Another option was to reduce the size of the house. The community also provided each home owner with 70 first quality large logs which otherwise would have cost an estimated $10,000.

The Band Council decided that the houses would be Scandinavian style which provides good insulation and solid construction as well as appealing exterior and interior finishes. The future homeowners were their own project managers with responsibility for the construction of their home. The Band Council had contracts drawn up for the homeowners to use with their contractors and subcontractors. To complete the five houses within a relatively short time period, three non-Native log housing contractors were brought in to build three of the five houses. A Native log housing contractor built the other two houses.

Figure 2: Five Scandinavian style log houses were built at Kitigan Zibi. The owners of each log house selected the overall design and layout of their log homes.

The initiative allowed the First Nation to construct five log houses with a final cost varying between $70,000 and $125,000, depending on the size of the home and level of effort contributed by the home owner. Local labour was used for the work that did not require specialized log construction skills. Social assistance recipients and youth employment were used for site cleanup and basic labour work. This contributed to lower the construction costs. The formal training program which was included in the proposal was forgone because of the tight time frame for completing the houses. The home owners were given certificates of possession for their home, once the construction was finished and the technical inspections conducted by Band Council employees were completed.

The Kitigan Zibi Anishinabeg pilot project encountered few problems during construction. The success of the project can be attributed in large part to the good project planning, and the coordination and management provided by the Band Council. The project also resulted in further development. For example, the native log house contractor who constructed two of the houses has established his reputation on and off the reserve. He has since built another log house on reserve, and is currently building two houses off reserve. In addition, two of the social assistance recipients that worked on the project are now seasonally employed in the house construction industry, one of whom is working with the local native contractor. However, it is not clear whether sufficient timber resources are available on the reserve to significantly contribute to easing housing shortage in the community.

Sandy Lake

Sandy Lake First Nation is located about 227 kilometres northeast of Red Lake, in northwest Ontario. As of March 1995 there was a total on-reserve population of 1,457 registered members. Housing in Sandy Lake includes a large number of houses that must either be replaced or have major renovations, the cost of which may be almost equal to the cost of new homes. At the time of the initiative, only 60 of the 442 on-reserve housing units were considered to be in adequate condition.

Sandy Lake First Nation was in need of further housing and realized that new approaches to housing were required. The Band Council wanted to construct additional houses to alleviate the community's housing shortage and create jobs for the local population. Sandy Lake therefore submitted a proposal under the Innovative Housing Initiative to construct five two-bedroom log homes, which would be built using local labour and timber. The estimated cost to complete each house was $50,000. Sandy Lake people believed it was feasible to build the homes for $50,000 because most of the materials were available on-site and that due to the labour intensive nature of the construction, most of the remaining cost would be wages paid to local workers. The logs were to be cut and squared by local labourers at the local sawmill which was operated and administered by the Sandy Lake Development Corporation.

Figure 3: Five houses using a milled-log process were built at Sandy Lake. Only the exterior of the house resembles logs.

Sandy Lake's Band Council was accustomed to managing its housing projects and managed the innovative housing pilot project according to its existing housing policies and practices. The houses would be band owned and allocated under the same rules used for other new housing. The project was administered by the Band Council who recognized that the log housing component may bring with it special construction issues. The Band Council assigned a project manager with 20 years of residential construction experience to the project and hired a non-native instructor to train eight band members in constructing log homes. The workers were previously on social assistance. Sandy Lake received funding towards the cost of training and labour from the Sioux Lookout Area Aboriginal Management Board (SLAAMB).

In order to control labour and construction costs, and to make optimum use of the spruce logs available to the community, the decision was taken to employ a modified milled-log process so that only the exterior face resembled a log. The band harvested their logs and used local saw mills to cut the top and bottom of the logs so that they all would be of the same thickness. The natural log finish of the front and back of the logs provided the aesthetic appeal of log houses. The Band Council also initiated a tight financial control process for the project. One element of this was to ensure that labour productivity and costs were reported and revised on a weekly basis.

The result is that Sandy Lake built five log houses using local resources and labour, including social assistance recipients, at a cost of $55,000 per house as estimated by the band. This cost does not include the $6,000 for the transportation of some of the construction materials which had to be flown in. The total cost for building a log house at Sandy Lake compares favourably with that of a stud-framed house, which is estimated at between $70,000 and $80,000, excluding water, sewage and electricity.

During the construction of the five houses some technical problems related to the log housing aspect were encountered. These pertained mainly to the lateral shrinkage of the logs and airflow between the logs. Acceptable solutions were found and the problems addressed satisfactorily.

For Sandy Lake, log houses are a cost effective and preferred option by the community because they are of better quality and should last longer than stud-framed houses. The construction of log houses also create more employment for band members within the community than building stud-framed houses. Since the completion of the pilot project, the band has undertaken the construction of 18 log homes which are modelled on the five homes built during the pilot project.

Tsuu T'ina

The community is located in the southern region of Alberta. As of November 1995, the on-reserve population was 1,040 individuals. There are approximately 220 houses on reserve. It is Tsuu T'ina's policy that all housing is community owned. There is no individual ownership of housing.

Tsuu T'ina viewed the innovative housing initiative as an opportunity to demonstrate that it was possible to build and maintain low cost housing, further develop the skills of the nation members and utilize as much of the nation's natural resources as possible. However, the Band Council recognized that the community did not have the necessary experience in building log houses which was the intent of the innovative housing initiative. The Band Council submitted a proposal and requested DIAND approval to use local materials other than logs. The request and proposal to use local sand and gravel was accepted by DIAND.

Tsuu T'ina's pilot project was integrated into a new subdivision on the reserve which was in the process of development. The band council established a budget of $50,000 per house for the construction of the homes, excluding water, electricity and sewage hookup. To do this the nation decided to build five bungalows which utilized a low-cost design. The houses were smaller than the norm in the community and would have only partial basements. The houses were to be built using pre-fabricated building materials and the nation's own sand and gravel. The First Nation endeavoured to use the skills of individual nation members to carry out as much of the construction as possible. It employed individuals who were on social assistance and provided them with training.

As a result of the initiative, five bungalow houses were built at a cost of $50,000 each excluding infrastructure costs. The overall cost to the First Nation for construction of the units was $250,000 over and above the $250,000 that was allocated to the nation from DIAND. The majority of the work on this project was done by the Tsuu T'ina Nation members consisting of up to 30 full and part time workers. Unskilled members were employed as assistants on many of the trades.

From Tsuu T'ina's perspective, the innovative housing initiative was cost effective because they were able to build the five houses, excluding the infrastructure and utilities, for the $250,000 that was provided from DIAND. The average cost of constructing a house at Tsuu T'ina is approximately $75,000.

From the perspective of the Innovative Housing Initiative, this pilot project did make good use of local labour for construction. However, very limited amounts of other local resources were utilized. The community did demonstrate that it could build lower cost housing by reducing the size and by using more economical construction material. This, however, may result in higher maintenance costs.

Figure 4: One of the five stud-framed houses built at Tsuu T'ina during the pilot project.

Wasauksing

Wasauksing First Nation is situated 64 kilometres west of Huntsville on the eastern shore of Georgian Bay in Ontario. An estimated 400 members reside on reserve. There are 55 rental housing units on the reserve.

The Wasauksing pilot project was designed to produce five residential dwellings, utilizing First Nation labourers, including social assistance recipients. The pilot project would include a log building training program. Wasauksing's proposal identified that five one bedroom log house bungalows with potential for a second bedroom in the loft areas would be built at $50,000 per unit. The logs would be purchased from another First Nation and the project would use only local labourers.

The management of the pilot project was made the responsibility of the Wasauksing Lands Incorporated (WLI), a company administered by the former Chief and two of her family members. The WLI received the $250,000 provided by DIAND in its entirety, and then subcontracted with one individual for the entire project. That individual did not have experience in large projects, although she had taken a log building course. The project soon developed a number of problems and little concrete action was taken to redress the situation once it became evident that the project was in serious difficulty.

As of April 1996, over $230,000 had spent and only one home was on its foundation with framing being worked on, and one other foundation was completed. The exterior walls on two other log homes had started, but no progress had been made on the fifth house.

In March of 1997, the Wasauksing Nation asked the department for more funds to complete the houses which were under construction. As of that date, only 70% of two houses were completed and the nation requested that the $50,000 subsidy for each of the three outstanding units be written off, with no pay back. The department agreed to give the Wasauksing Nation another $70,000 to complete construction of the two houses, but did not agree to write-off funding provided for the other log homes. Upon receipt of the additional DIAND funding the new Band Council was able to arrange for the completion of the two partially completed log houses. The final cost estimate for the two houses is over $500,000.

As a result of the innovative housing initiative two log houses were built which are owned by the residents and not the band. Poor financial and construction management are two of the principal reasons why only two houses were completed and two other houses started but never completed. The fifth house was never started. The Wasauksing pilot project did not use local construction materials but purchased logs from outside of the province, and not from another First Nation as had been stated in their proposal. In addition, the project made only limited use of local labour. The log building training program originally planned was not provided to any of the First Nation members who participated to the construction.

Figure 5: One of the two Scandinavian style log houses built as Wasauksing.

The Wasauksing pilot project was a failure, fraught with financial and project management problems. The project had major flaws, such as an unrealistic schedule, poor project management, and little financial and other controls over the contractor. The Wasauksing First Nation had experienced financial management problems since 1993. As a result, district officials worked with the First Nation to develop a remedial action plan including the identification of a third party manager.

Part II: Evaluation Issues

This part addresses the evaluation findings against the evaluation issues and questions.

Success of the Initiative in Addressing Housing Needs

The main purpose of the innovative housing initiative was to demonstrate that increasing the use of local material and labour could help alleviate on-reserve housing shortages. Each participating community was to build five houses by using local material and labour including some social assistance recipients. Houses were to be built to national building code standards. The evaluation judges success along these main dimensions: the number of houses built, the extent of local resources and labour used, the adequacy of the houses, and the cost effectiveness of the houses built.

Most of the communities completed their pilot project according to the criteria applicable to the initiative.

The pilot projects demonstrated that local resources, when available and of sufficient quality and quantity, can contribute positively to a First Nation's housing program. Three of the five First Nations used logs found on their own land to construct their houses with the fourth First Nation importing its logs from another province.

The initiative resulted in supplying much needed housing to each of the five participating communities. A total of twenty two of the planned twenty five new houses were built and provided to families and individuals, some who may have not received housing otherwise or received it earlier than they would have.

Likewise, the use of local labour and provision of training to unskilled workers can have positive impacts to the First Nation community. The five communities use of local labour in the construction of houses was varied. Three communities made significant use of local labour, including social assistance recipients. Two communities made only minor use of local labour. A formal training program and on-the-job training were provided in one of the pilot projects and varying levels of on-the-job training was provided in the other projects. Table 1 summarizes results along these indicators.

Table 1 - Success Indicators

First Nation	Number of Houses Built	Type of Local Material Used	Amount of Local Labour Used
Big Trout Lake	5	Logs	Significant
Kitigan Zibi Anishinabeg	5	Logs	Moderate
Sandy Lake	5	Logs	Significant
Tsuu T'ina	5	Sand and Gravel	Significant
Wasauksing	2	None	Minimal

Three communities built houses that are deemed cost effective. The cost-effectiveness of the houses built would need to be measured over the long term.

The evaluation considered the planned and an estimation of the actual cost of the houses excluding costs such as roads, water and sewage and other related costs. The evaluation was not able to collect detailed information on exact costs, however an estimate of the costs is known for each of the five communities, as shown in Table 2.

Table 2 - Planned and Actual Cost

First Nation	Planned Cost per House	Actual Cost per House	Deemed Cost Effective
Big Trout Lake	$64,000	$105,000	No
Kitigan Zibi Anishinabeg	$89,000	$70,000 - $125,000	Yes
Sandy Lake	$55,000	$70,000 - $80,000	Yes
Tsuu T'ina	$50,000	$50,000+	Yes
Wasauksing	$50,000	$250,000+	No

Building code inspection reports were completed for all pilot projects. In four of the five communities the houses built are generally of adequate quality, despite the technical problems encountered. One community constructed houses of superior quality. Three of the five pilot projects were deemed by the First Nation to have been cost effective. In the two log housing projects, each project's cost effectiveness was greatly influenced by the First Nation's

location, access to local resources and availability of local labour and specialists such as log housing contractors. In the other case, cost effectiveness was assessed by comparing the construction costs to the usual housing costs in the community.

The cost of the pilot projects varied widely among the participant communities and between planned and actual costs. This variance was partially the result of the communities understanding of the initiative's objective regarding cost which resulted in different approaches taken by the communities. Some communities believed, based on program requirements, that by using local resources and labour they were to build houses at a total cost of $50,000 each. However, in at least one other case, the community viewed the $50,000 as DIAND maximum contribution to funding. This community required the future owners of the houses to supplement the $50,000 with a residential mortgage assumed by the owner. As a result, the cost of each home varied between $70,000 and $125,000.

In all cases, the real cost effectiveness of the houses built under the initiative will need to be measured over the long term. Maintenance costs of the houses are not known at this time. The level of maintenance expenditures would need to be measured over a period of twenty to thirty years in determining the cost effectiveness of the pilot project houses. A house which initially costs less to build is not cost effective if maintenance costs are unreasonably high or if after twenty years the house is no longer in livable condition. If, on the other hand, a house which initially costs more to build can be maintained at a lower cost and is still in good shape after a period of twenty years, then the house may be more cost effective.

Impacts of the Initiative

The initiative aimed to positively impact on the participant communities by helping to find solutions to housing needs, providing training, and creating short and long term employment for the communities' members. The initiative has also created some other impacts, both positive and negative.

The initiative was successful in helping two First Nations to identify an approach to address a part of their housing needs.

Two of the five communities provide support for the premise behind the initiative, that using local resources and labour under the right conditions can contribute positively to addressing a First Nation's housing needs. In these communities, however, other factors were important.

These included a well articulated community housing policy, good project management, involvement of the owners in the process, including financial responsibility, and the purchase of outside expertise.

The techniques and practices developed during the pilot project continue to be employed in the construction of other homes in the community. In one community, the band is constructing 18 additional log houses similar but larger than those constructed during the pilot project. In a second community the construction of two new log houses was completed since the pilot project. These two communities are less dependent on off-reserve construction materials because for the short term at least there is a sufficient supply of logs available on-reserve for the construction of log homes. The ultimate test for determining the long term impacts of the initiative for these two communities is whether there is sustainable resources to continue the log housing approach into the foreseeable future. Table 3 indicates the extent to which this intended impact was realized in the communities.

Table 3 - Housing Program, Training and Employment Impacts

First Nation	Impact on Housing Program	Training: Formal/On the Job	Short Term Employment	Long Term Employment
Big Trout Lake	Medium	1 week classroom and 25 weeks of on-job training.	Social assistance workers and youth were used.	None
Kitigan Zibi Anishinabeg	High	A formal training program was cancelled due to time constraints.	A local contractor and some local skilled and social assistance workers used.	Enhanced local firm
Sandy Lake	High	No formal training was provided	Local workers and social assistance recipients.	Seasonal
Tsuu T'ina	Medium	No formal training was provided.	30 full and part time workers were used as assistants on all trades.	None
Wasauksing	Low	Not assessable.	Not assessable.	None

The initiative created training opportunities and short-term employment for all communities and has also lead to some long-term employment for some of the workers involved with the pilot project.

All five First Nations used local labour with some including social assistance recipients. However the rate of participation varied among the communities. Some communities used local labour almost exclusively while some communities made very minimal use of their work force. In all communities, on-the-job training was more often used than formal training. Table 3 summarizes the training and employment impacts.

To allow local labour to participate in the construction of the houses, all the communities provided some on-the-job training. Most of the First Nations did not implement a formal training program for log house construction. The tight time frames under which some of the pilot projects were operating did not allow sufficient time to train unskilled workers. As well, some communities could not afford the cost to provide formal training to their unskilled workers. Formal training provided by log house experts may have lessened the number of technical problems that were encountered as well as facilitated the process for correcting problems. However, since the focus of the pilot projects was on log housing, a portion of the training may not be beneficial if stud-framed houses are built.

Short term employment was provided during construction. There was also some long-term employment effects where additional houses were built. Workers could then use skills that were learned from the pilot projects, skills that may not be easily transferrable to other types of construction since log housing uses specialized techniques. Figure 6 illustrates one of the technique used in two communities. One of the local contractors who participated in one of these pilot projects has also benefited. He has established his reputation on and off reserve. He has since built one house on reserve and is presently building two houses off reserve. He has also hired one of the social assistance recipients who worked on the project. The ability of this contractor to establish his reputation off reserve also indicates the impact of the "quality" of construction of the houses in this particular pilot project. In one other community there has been some limited long-term employment created as a result of the initiative. The level and duration of seasonal work for band members has increased because log housing requires more labour than conventional stud-framed homes.

The initiative produced some unintended impacts, both positive and negative.

Although many problems were encountered during the process, the pilot projects have created a sense of pride and accomplishment for the communities, and owners and tenants of the houses that were successful in their projects. The communities succeeded in managing and completing a project for which they had little prior experience. There is a sense of accomplishment that technical problems were dealt with and overcome. The owners and occupants of the log homes are happy with the result and many prefer the appearance of a log house to a regular style and like living in the log houses.

Figure 6:

Two First Nations selected the Scandinavian style of log house construction, while two others adapted their log house construction techniques to the smaller size of trees that grow on their reserves (see figure 7).

The Scandinavian style of log houses requires the builder to scribe and carve the length of each log individually so that they form an airtight, aesthetically pleasing structure.

This type of construction requires the skill and knowledge of experienced craftspeople, with hands-on experience and training being prerequisites to success.

One community experienced major problems with implementing its pilot project and failed to complete it. The department had to provide extra funding to this community in order that two houses could be completed, the plans for the three other houses were foregone. The pilot project further contributed to the band's serious financial situation which it was experiencing at the time of the initiative.

This pilot project also caused hardship for the future occupants of these log homes. The construction of the two completed houses was very lengthy, experiencing significant delays and problems which were difficult to resolve. During this period the home owners had no other alternative but to live in the uncompleted houses. This situation created difficult and dangerous living conditions for these persons. Three other families that expected to receive new housing did not, because their houses were never completed.

Barriers Encountered and their Resolution

The project's criteria of using local resources and labour created some problems which had to be resolved during the completion of the pilot projects. Other problems were also encountered.

The use of logs for constructing the houses resulted in difficulties in accessing adequate resources and in some technical problems.

Four of the five communities who participated in the initiative undertook to build log houses. The use of log house construction techniques resulted in some problems. In the case of one First Nation, appropriate sized logs were not available and small diameter logs were used. In another case, logs were bought from another community, resulting in an increased cost. In these cases, and even when adequate resources were available, many technical problems occurred during construction. These problems were mainly caused by the inherent difficulty with constructing log houses and a general lack of experience with this type of construction. Exhibit 1 lists some of the technical problems encountered and Figure 7 illustrates one of the solutions implemented.

Exhibit 1

Examples of Technical Problems Encountered:

- logs which were twisted and warped because of improper handling and storage;
- wood shrinkage around the openings for doors and windows;
- use of small logs caused structural integrity problems and poor insulation;
- poor caulking resulting in drafty houses;
- where interior wall had been nailed to exterior log wall, the exterior walls did not settle evenly, resulting in large cracks between the logs and/or warped/damaged interior walls; and
- problems with the installation of cabinets and cupboards resulting in later damage.

Figure 7:

One log housing technique, adapted to smaller logs, achieves weatherproof connection by grooving the logs with a chain saw, and inserting a strip of plywood. Once the log walls have been raised, and the logs have finished drying, caulking is added which, in turn, is covered by chinking.

Scarce specialized skilled labour rendered resolution of technical problems more difficult.

Local resources can be used to advantage to address housing needs. However, in many of the pilot projects, specific skills in scarce supply were required to use available local resources properly and economically. The use of local resources did not automatically result in lower cost housing and might in fact have lead to more costly housing.

Each of the five First Nations had residents available to work on their project and generally complied with the initiative's local labour criteria, including the use of social assistance recipients. However, they all lacked, at varying degrees, the local expertise needed to build log homes meaning that project management was not always aware of the potential problems with log construction they could not always be pro-active, they had to learn as they went. Two First Nations brought in off-reserve contractors to help their local contractor build the five homes within the allocated time frame. Another moved away from log housing when it presented its project, considering that it did not have the required resources. In addition, one community brought in an outside trainer who could provide advice to resolve the technical problems. In most cases, however, technical problems were dealt with as they developed and eventually an acceptable solution was found. It is difficult to tell from the inspection reports whether the quality of the houses is adequate and whether all houses meet the National Building Code. Further, in the short run, the technical difficulties contributed to increase the construction costs. It is also probable that they will have impact on the maintenance costs in the long run.

In some cases, DIAND's role in the initiative caused problems to First Nations. There were delays in approving projects and some of the initiative's conditions fluctuated over time and were not always clear to First Nations.

One element that lead to criticism of the department by the communities is the approval process for their proposal. Communities argue that the department did not make clear its requirements and they were being asked to provide more information on several occasions. They say the approval process delayed funding and pilot projects were subsequently late in starting which caused certain difficulties with transportation or availability of construction material. DIAND's view is that proposals were reviewed in a timely manner, however, some of them did not meet the criteria established for the initiative. In these cases, DIAND requested the community to provide additional information in order to improve the proposal. The follow-up process may have delayed funding to First Nations, but the alternative was to reject the proposal submitted on the basis that it did not meet all of the requirements. For example DIAND was strict on the requirement to employ social assistance recipients and a few proposals did not include this information. Instead of rejecting these proposals, they were returned to First Nations to allow them to address the outstanding criteria.

When a new concept is to be tested it is prudent to ensure as much as possible that conditions under which the concept is tested are as amendable as possible. In developing projects such as the Innovative Housing Initiative, DIAND needs to clearly establish the conditions under which it should test the premise. First Nation communities are different from one another in many respects. Certain types of housing programs are more suitable to some communities than to others.

The project criteria and requirements were not always understood or interpreted in the same manner by DIAND and the First Nations. Some of the communities that participated in the initiative believed that DIAND could have done a better job in clarifying the initiative's criteria and conditions especially with respect to the financial conditions. At the beginning of the initiative, it was understood that First Nations were to built log houses for $50,000 each. That is why some communities believed that they were required to construct the houses for $50,000 each, the amount of the DIAND contribution. These communities attempted to build houses for an amount which in all cases was considerably lower than the communities usual housing cost. Some of the communities then experienced cost overruns. Later on the interpretation of that criteria was modified to mean that DIAND was providing $50,000 towards the construction of each log house. The evaluation also noted that there were misunderstanding in the communities visited as to other criteria they had to meet. For some, for example, it was very clear that using logs was a condition for funding since one of the purposes of the initiative was to test the feasibility of building low cost log houses using local logs. For one project, the requirement to use logs was abandoned which facilitated the participation of the community but did not result in a very innovative project.

Lessons Learned

Lessons can be drawn from the pilot projects and the initiative in general. Specifically, there are lessons regarding the initiative's effectiveness to demonstrate solutions to First Nation's housing problems and the means by which local labour and resources can contribute positively to a First Nation's housing program.

For two communities the initiative did demonstrate an alternative approach to addressing housing needs.

As discussed, two out of the five communities that participated, the initiative contributed to finding effective solutions to their housing needs. Both of these communities have built additional houses using the same techniques as they used for their pilot project. Log housing was the method used in both cases and both of these communities had sufficient logs of the necessary quality available. Both pilot projects experienced strong project management and also sought outside help to provide the expertise and advice and alleviate their lack of log housing construction skills. The quality of their log houses equals or exceeds the quality of stud-framed houses.

These communities both have an approach they can use now, but they will only be able to continue with this approach on a long-term basis if there is sustainable development of their resource. The use of logs to construct affordable housing is a viable option for these First Nations. Prior to making a commitment to build log houses these First Nations investigated whether this was a viable option for them.

There were factors external to the initiative's criteria which impacted on the results of the pilot projects. These included a well articulated community housing policy and good project management, including the purchase of outside expertise when required.

As evident from Kitigan Zibi's experience, the community's own housing policy contributed significantly to the success of their pilot project. It is the community's policy that housing is a shared responsibility between the band council and home owner. In addition to the $50,000 per house provided by DIAND, the home owners also contributed financially. However, community members with low income cannot directly benefit from this approach as they do not have the capital available to contribute towards the cost of a house. The additional funds allowed for the construction of better quality houses. In Sandy Lake, there was also a clear vision as to how the initiative could be integrated in the community's housing policy.

In four of the five communities good project management was there and operated effectively and contributed to successful outcomes. Some of these communities recognized the special considerations required to use local resources and labour and found appropriate solutions to offset potential obstacles. For example, purchasing outside expertise to provide advice and training to ensure that the log houses were properly constructed compensated for the lack of experience in this type of construction.

Lessons and information available on log house construction were not shared with First Nations.

At the time of the initiative the department was aware that a fair amount of material existed on log house construction and its particular features. The potential of log house construction, as well as the many problems which could be encountered were also known. The department understood that log houses were a viable option only if they were built properly, and that this required some specialized skills.

CMHC agreed with the department that the concept of log housing had merit and was worth examining. However, on learning that DIAND was proceeding with a pilot project involving log house construction in First Nation communities, CMHC provided the department with a report of its experience with log housing. The report identified a number of concerns regarding the applicability of log housing for First Nation communities. The report also identified cases where log housing had been successful and also alternative methods to consider.

The availability of local resources and the feasibility of using them need to be assessed in relation to the community's capacity and other relevant considerations.

The decision to use local resources needs to be made in the context of the community's own environment and capacity. Some pilot projects demonstrated that the use of local resources and local labour do not necessarily result in lower costs. In fact, in some circumstances the two criteria can work at cross purposes to each other; using local resources can lead to higher costs. The four pilot projects which used a log housing approach did not have the required and/or sufficient specialized skills to complete their projects within the required time frame. In deciding to undertake a log housing project, a community needs to consider if its local labour force is sufficiently trained and experienced and, if not, whether the means to compensate for it are available. The use of local labour might be as beneficial to a community as using local physical resources. The choice depends on each community.

The criteria applicable to pilot projects should be well defined, directly related to the objectives pursued and uniformly used in assessing proposals.

As noted earlier in this report, the criteria defining the initiative varied. These variations affected the nature of the pilot projects funded as well as the objectives of these projects. In future initiatives, DIAND should make sure that the selection criteria are clear up front. It should also determine the extent to which proposals are allowed to depart from these criteria without affecting the expected results.

Differences in the criteria applicable to selected communities made for very different projects and it was difficult to assess whether variations in results were attributable to these differences or to changes in local conditions or approaches. For example, the obligation made to most communities to test log housing created far different projects compared to the community where this obligation did not exist. Similarly, the objective of building low cost housing was not interpreted the same way in all projects. The funding level was initially intended to demonstrate the feasibility of low cost housing. It was later transformed into a uniform subsidy towards the demonstration of the feasibility of a certain type of housing construction.

It was also not clear why changes were made to the applicable criteria, whether the conditions were changed with a view to increase the chance of meeting the project's objectives or rather to suit the particular situation of a community which would not otherwise have been able to meet them. Ultimately, these changes resulted in wider variations in the parameters applicable to the pilot projects and in different treatment of the First Nations who submitted proposals. Although each approved project met the criteria applicable at the time of its assessment, it is not clear whether the projects were selected because they were the best among the proposals received or based on other considerations. However, departmental officials asked some of the selected communities to make changes to their proposal in order to meet the applicable criteria.

What Lessons Support the New On-Reserve Housing Policy

This part of the evaluation addresses the lessons that can be drawn from the pilot projects and the initiative. Specifically, this issue comments on how lessons learned can contribute positively to a First Nation's housing program.

A community's own housing policy and practices have an impact on its capacity to respond to housing needs.

The new on-reserve housing policy emphasizes First Nations community control and the use of local resources for on-reserve home construction. The new policy allows First Nations more flexibility in terms of housing design and the work force they use. The key elements of the new policy are local involvement, innovation, cost effectiveness and the forming of productive links between home construction and community economic development and employment. Rather than bringing in construction managers and contractors from outside the community, First Nations can build local expertise through on-the-job and formal training.

The pilot projects demonstrated that communities which have a clearly stated housing policy supported by a strong project management capability are more susceptible to meet their housing needs while taking into account their community's own environment. These communities are also in a better position to integrate innovative or new ways of doing things.

Only one community had a policy requiring financial responsibility on the part of homeowners. Its policy has impacted on the quality of the homes constructed and has created pride of home ownership which may also significantly reduce long-term maintenance and operating costs. However, this policy was probably established within the context of the community's environment. The community is economically well established and there are few members on social assistance, which allows for financial responsibility on the part of homeowners. This policy of financial responsibility has resulted in the generally high quality of housing on the reserve.

Development of the local labour force and contractors can provide the community with expertise it can put to use in the future.

The pilot projects which were successful in identifying an alternative approach to their community's housing, involved local labour and outside contractors who provided them with some skills and expertise. The provision of the training and development opportunities has paid off for these communities by allowing them to put to use what was learned from their pilot project and continue with the approach identified. Again, the involvement of local labour and provision needs to be done under the right conditions and in the context of the community's capacity. There is a need to ensure that labour is adequately skilled and trained, and this is accomplished by training and proper supervision of workers. By developing its labour force a community may realize other economic benefits as well.

Innovative ideas supported by technical competence can result in solutions that can assist in addressing First Nations housing needs.

The confines of traditional construction practices limits the solutions that are available. Innovative ideas supported by technical competence can result in solutions that, within a specified budget, can reduce the amount spent on imported material and increase the level of employment generated on the reserve. However, this initiative is only one among a number of potential solutions to alleviate housing shortage or improve housing quality. It has not exhausted the range of possible innovations. It has however illustrated that solutions are not limited to the "how" of building houses, they can also relate to the community policy environment.

However, prior to a community undertaking an innovative project a pre-feasibility study should be completed to determine if the community has the capacity and if the requirements can be met. There must be recognition by a First Nation that when the project requirements are not realistic, it must either decide not to participate or request that the project requirements be modified.

Mechanisms and/or guidelines need to be established to help better evaluate the levels of risk and potential success for a new or significantly different project or undertakings. This is a responsibility for the First Nation as well as funding organizations supporting pilot or innovative projects.

Terms of Reference

Terms of Reference

Evaluation of First Nations Innovative Housing Initiative

Background: The federal government's on-reserve housing budget for the 1996-1997 year was $352 million. Funding is a shared responsibility between DIAND ($222.5 million), CMHC ($129.8 million) and First Nations communities. Adequate and safe housing for First Nation communities is a priority for First Nation leaders as well as the federal government. Many initiatives have been undertaken by DIAND to deal with on-reserve housing. One such project undertaken by the department in support of the former Minister's initiative was the "First Nations Innovative Housing Initiative".

The objective of the initiative was to investigate alternative approaches to housing construction on-reserve that would enhance the use of local resources to build lower cost, quality housing allowing the community to be less dependant on outside contractors, suppliers and tradespeople.

From the many proposals submitted under the "First Nations Innovative Housing Initiative", five communities in the Quebec, Ontario and Alberta Regions were selected to develop a housing project. Each community was permitted a maximum of five houses for which DIAND would contribute a maximum of $50,000 per house. The communities were required to meet National Building Code standards in the construction of the housing units. As well, projects were to utilize local resources including materials available in the community such as logs, timber, sand, gravel etc. and a work force that included individuals on social assistance supported by on-the-job training. Communities were provided with the option of using materials from other on-reserve communities when those materials were not available on their own reserve.

Applicants were required to provide a cost breakdown with funding sources, details on the construction methodology, project schedule, and training and project supervision. A further requirement of the program was that an evaluation of each pilot project would be undertaken once construction of the housing units was completed.

Need: At the time the "First Nations Innovative Housing Initiative" was introduced, the former Minister undertook that there would be an evaluation of the completed initiative in order that other First Nations might learn from their experience. The lessons learned could help to support the implementation of the new on-reserve housing policy.

The need for an Evaluation of the "First Nations Innovative Housing Initiative" was identified and approved by the Departmental Audit and Evaluation committee (DAEC) as part of the Departmental Audit and Evaluation Branch (DAEB) 1997-1998 Plan.

Scope: The evaluation will be limited to the five community projects funded under the "First Nations Innovative Housing Initiative" and will occur in the Quebec, Ontario and Alberta Regions where the five communities are located. The evaluation will focus on gathering information on the results achieved by the "First Nations Innovative Housing Initiative" and the lessons learnt to further assist in the implementation of the new on-reserve housing policy.

Issues: How successful was the initiative in helping First Nations to address their housing needs? (For example, better quality housing, cost effectiveness, use of local labour and natural resources, training and participation of local labour in construction processes).

- What were the unintended impacts?
- What barriers were encountered?
- What lessons were learned? and
- How can the lessons learnt be built on to support the implementation of the new on-reserve housing policy?

Approach: The evaluation will use multiple lines of evidence. At this point, it is planned to use program file reviews, case studies, interviews with First Nations management and departmental employees in regions and districts and to carry out analyses of gathered information. Case studies will involve site visits to the communities involved in the "First Nations innovative Housing Initative" and it is intended to include all five communities. The number of interviews will be determined during the planning phase. In addition, the evaluation will make use of an advisory committee composed of representatives from DIAND and First Nations.

Resources: The evaluation will be performed using contracted and DAEB resources and will be managed by DAEB. A budget of $50,000 has been established for consulting work.

Time Frame: The evaluation will begin in November 1997. A draft report will be available in March 1998 and the final draft ready for DAEC in June 1998.

Approved:

Cynthia Williams
Assistant Deputy Minister
Socio-Economic Policy and Programming
and Program Re-Design
November 15, 1997