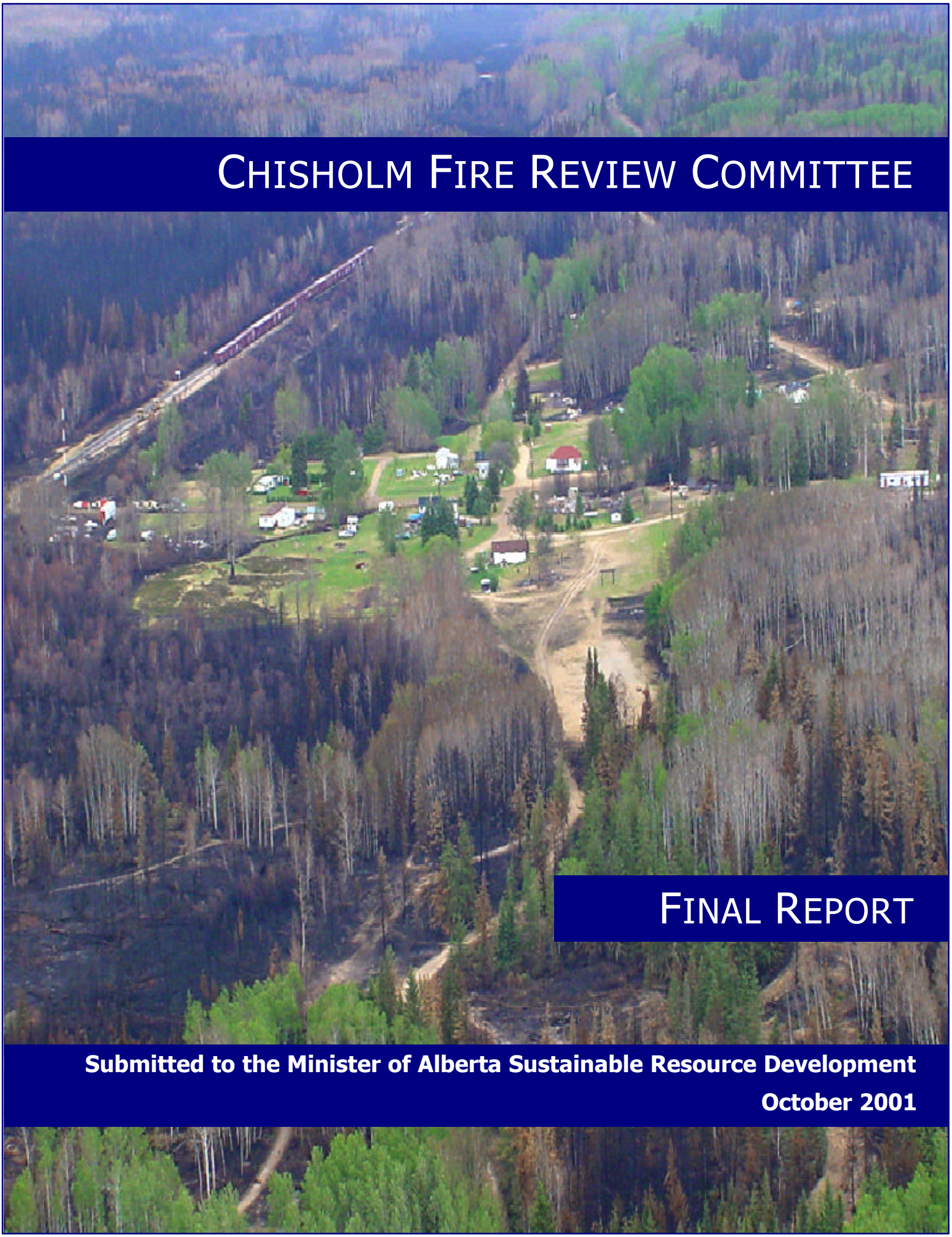
CHISHOLM FIRE REVIEW COMMITTEE



FINAL REPORT

Submitted to the Minister of Alberta Sustainable Resource Development

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Cover Photo - Chisholm Community - Looking North After May 28, 2001

Photo courtesy of Alberta Sustainable Resource Development

EXECUTIVE SUMMARY

The Chisholm fire of May 23 – June 4, 2001 and the surrounding events prompted the Minister of Sustainable Resource Development to establish a committee to review the fire incident. The Chisholm Fire Review Committee carried out this review in the summer of 2001 through a public outreach process, a review of department policies and procedures and discussions with department staff.

Generally, Alberta's fire suppression activities conducted by Alberta Sustainable Resource Development (SRD) are very effective, however a small percentage of wildfires continue to escape initial suppression efforts to become large fires. This is of particular concern in wildland-urban areas, such as Chisholm.

Broadly, the Committee concludes that it is necessary to address wildland-urban issues proactively in a cooperative and interdisciplinary manner. The Chisholm Fire Review Committee believes that such actions will increase human safety, decrease property losses and allow wildland fire suppression resources to be re-directed to protect forested areas that are often vital to the industrial and economic well being of the community.

In its review, the Committee identified major issues and developed a recommendation for each. There is no single solution to the identified issues but key actions as expressed in the Committee's recommendations can help reduce the risk of loss.

ISSUES AND RECOMMENDATIONS

The Committee's review process revealed four broad issues that overlap and necessarily support each other. The Committee's recommendations are based upon the following issues:

- Communications
- Unified planning and action (interagency coordination)
- Community protection
- Presuppression planning and suppression for existing and anticipated extreme fire conditions

Additionally, the Committee makes a recommendation regarding the status of the recommendations contained in the Alberta Fire Review Report, 1998 (KPMG report).

Recommendation 1

SRD take the lead in ensuring communication is a top priority before, during and after fire events by developing and implementing a comprehensive communications plan. The plan should include:

- strategies and tactics to actively communicate with Albertans most directly affected by wildland-urban fires, including a media relations component;
- education on roles and responsibilities for different stakeholders, including actions property owners should take to reduce the risk of loss;
- allowances for more personal communication methods; and
- details on interagency communication before a major fire incident.

Recommendation 2
SRD implement means of improving command and resource coordination with MDs, the RCMP, local industries and property owners. This can be accomplished by establishing an integrated and coordinated command system to ensure interagency information and resource sharing and decision-making during complex wildland-urban fires.

Recommendation 3
SRD recognize the need for wildland-urban strategy and tactics separate from those of wildfire suppression. It is recognized that wildland-urban strategy and tactics involve pre-fire preparation to reduce ignition potential within the home ignition zone, and fire response tactics that focus on reducing the potential for a structure to ignite from wildfire.

Recommendation 4
During existing and anticipated extreme fire behaviour conditions, SRD should use other strategies in addition to resource build-up to reduce the occurrence, or impact of large fires.

Recommendation 5
SRD place a high priority on implementing any outstanding recommendations of the KPMG report (Alberta Fire Review, 1998) and review the success of the recommendations implemented before the Chisholm fire incident, in light of and in the context of the Chisholm fire.

PUBLIC OUTREACH THEMES

Informal sessions with area residents were held in Chisholm July 27-29 and with local authorities in Slave Lake July 30-31. Individual meetings were also held in Edmonton and Committee members had telephone conversations with residents of Chisholm, Smith, Flatbush and Hondo. While participants raised a wide range of issues and suggested solutions, four recurring themes emerged:

- Communications
- Interagency Coordination
- Initial Attack Efforts Response
- Community Protection

The most predominant issues and concerns surrounded communications and interagency coordination. Area residents did not have adequate and timely information about:

- the fire itself;
- the status of their properties post-fire;
- evacuation protocols;
- their responsibilities as land/homeowners before, during and after a fire incident; and
- the roles and responsibilities of SRD, the Municipal District (MD) of Lesser Slave River No. 124 and the local RCMP.

The agencies involved (SRD, MD 124, RCMP) before, during and after the fire may not have had a clear understanding of each other's roles and responsibilities, nor did they each have access to the same information in a timely manner. There was, however clearly a desire for greater harmonization and coordination of efforts during the fire.

As with the Committee's recommendations, the public outreach themes also overlap and support each other.

While this report concludes that there is room for improvement of SRD wildfire policies, practices and procedures, the Committee recognizes the efforts of SRD staff for ensuring the safety of human life in the 2001 Chisholm fire.

1.0 INTRODUCTION

1.1 BACKGROUND

The Chisholm fire, which began near a Canadian National (CN) Railway line May 23, 2001, destroyed 10 homes, a trapper cabin, 48 outbuildings and some vehicles, mostly in the Hamlet of Chisholm, about 150 kilometres (km) north of Edmonton (located in the MD of Lesser Slave River No. 124). There were no human lives lost in this fire.

Wind and dry conditions created extreme fire behaviour in the Chisholm fire burning approximately 116,000 hectares (ha) of land - an area three times the size of the city of Edmonton. Characteristics associated with extreme fire behaviour are rapid spread rates, continuous crown fire development, medium to long range spotting, firewhirls and massive convection clouds.

On May 27 and 28, the out-of-control fire near Chisholm ran 35 km northwest toward Slave Lake and on May 31, 2001, the fire was burning 10 km from Smith, seven km from Hondo, and eight km from Slave Lake. The Chisholm fire was the largest of the six wildfires in Alberta at that time. Firefighting efforts included:

- 514 firefighters
- 34 helicopters
- 31 bulldozers
- 201 skidders
- 45 water trucks
- 84 fire management personnel.[1]

The fire severely impacted the Hamlet of Chisholm through loss of property and disruption in the lives of residents. Additionally, the forest industry lost some 4.5 million cubic metres (m^3) of growing stock and over 6,300 ha of regenerated cutblocks. The area's oil and gas industry, railway and electrical infrastructure also experienced substantial losses. The fire probably created wildlife mortality and loss of habitat and may have had negative effects on the watershed due to both the fire and efforts to control it. Added to these impacts, were the costs of employing hundreds of persons, numerous heavy equipment and aircraft for an extended period while fighting the fire.

The Government of Alberta spent $10 million fighting the Chisholm fire, and approximately $36 million fighting forest fires throughout the province as of early June.[2] The annual budget for fighting forest fires is $63 million. Resources for battling wildfires in Alberta include 132 lookouts, 40 firebases, 191 weather stations, 14 air tanker bases, 10 Fire Centres, and the Provincial Forest Fire Centre (PFFC).

[1] Figures obtained from June 4, 2001 update to Slave Lake-Chisholm Fire – Government of Alberta website.
[2] Figures obtained from June 4, 2001 update to Slave Lake-Chisholm Fire – Government of Alberta website.

1.2 THE CHISHOLM FIRE REVIEW COMMITTEE

Given the severity of the Chisholm fire and the impact it had on people living in the area, Sustainable Resource Development Minister Mike Cardinal announced the formation of the Chisholm Fire Review Committee on June 1, 2001. This three-member independent Review Committee was mandated to conduct an open and honest review of the fire operation for the overall Chisholm fire.

Terms of Reference

The Committee's terms of reference included a review of:

- the fire's behaviour;
- its encroachment into the community;
- prevention activities; and
- Alberta's policies and wildfire program.

As part of its review, the Committee was mandated to make recommendations on how Alberta can improve community protection during extreme fire events in populated areas.[3] In completing its review, the Committee gathered information from the public, MD 124, the RCMP, the Department of Sustainable Resource Development and Disaster Services Branch (Alberta Municipal Affairs).

Committee Members

Gerry DeSorcy, experienced in conducting reviews, chaired the Chisholm Fire Review Committee. Lucille Partington, an Alberta environmental and public consultation specialist and Jack Cohen, a wildfire expert from Montana joined Mr. DeSorcy in this review. The Committee received support from a team of six individuals all with relevant wildfire and/or public involvement experience.

1.3 REVIEW PROCESS

Public Outreach

The Committee's process for gathering information about the Chisholm fire included the following steps:

1. Mechanisms for the public to provide input were set up. From July 13 to August 17, 2001 Albertans could provide comments to the Committee using a toll-free line, e-mail, fax and mailing address.
2. July 13 - Committee members began directly contacting by telephone those most affected – the residents of Chisholm. Residents were advised of the Committee's formation, its intent to meet with residents in Chisholm and of the various input mechanisms. Some residents discussed their concerns during these conversations.
3. Once those individuals were contacted, Committee members began calling residents of nearby Smith, Hondo and Flatbush to advise them of the Committee's visit to Chisholm and Slave Lake.

[3] While the Committee recorded comments regarding compensation, it was not mandated to make decisions or recommendations about compensation.

4. Once as many as possible directly affected individuals were personally contacted, the Committee advertised its meeting locations and input mechanisms in Slave Lake newspapers, the Edmonton Journal and the Calgary Herald, as well as ensuring posters were placed in the communities.

5. July 19 - The Committee issued a news release describing the public outreach process and the Committee's mandate.

6. July 26 –Committee members met with SRD representatives for a high-level overview of the fire happenings and some background on wildfire behaviour and management. A representative of Alberta Disaster Services was also present.

7. July 26 – Committee members were available to meet with Albertans in Edmonton. Two individuals made presentations to the Committee.

8. July 27-29 - Committee met with Chisholm and area residents in Chisholm.

9. July 30-31 – Committee met with representatives of MD 124 and industry in Slave Lake.

10. August 2 – Committee met again with SRD representatives to clarify and get more information on issues raised by area residents, the MD and industry.

11. Throughout the process Committee members tried to reach representatives from CN Railway, the RCMP and others that might have pertinent information. (CN declined Mr. DeSorcy's request for a meeting.) The RCMP met with Committee members in mid-August.

By the end of the process in mid-August, the Committee's outreach process resulted in interviews with 47 individuals in Edmonton, Chisholm and Slave Lake, including representatives of MD 124, the RCMP and industry; and telephone interviews with 16 residents of Chisholm, Smith, Flatbush and Hondo.

2.0 OVERVIEW

2.1 THE BOREAL FOREST

The boreal forest is the largest environmental community in Canada. It takes up 35 per cent of Canada's landmass, 77 per cent of the country's forested land and 48 per cent of Alberta. The boreal forest is characterized by a predominance of coniferous trees that regenerate at different rates with the aid of fire. The boreal forest is an essential part of the environment contributing to healthy air, water, and soil. It is also a vital economic resource.

Wildfire is a natural part of the life cycle of the boreal forest. Boreal forests are susceptible to fire because litter from black and white spruce, balsam fir and jack pine does not easily decompose. As a result, it builds up on the forest floor and becomes extremely flammable. This build-up of litter also locks in nutrients. If forest managers did not suppress fire, boreal forests would naturally burn every 50 to 200 years (sooner in the south, later in the north). By burning litter, fire releases mineral nutrients and establishes the right conditions for seeds to germinate.

Large boreal wildland fires typically burn as "crown fires." These intense fires burn into the forest canopy and spread from treetop to treetop, releasing smoke and gases high up into the atmosphere. Crown fires are responsible for most of the areas burned in the boreal forests of North America and Eurasia.

Fire in the Boreal Forest

Fire in the boreal forest both kills and gives life. Eliminating all fire leads to a build-up of debris on the forest floor, which ultimately changes the ecosystem. Moreover, the accumulation of forest debris can lead to more intense fires that spread more quickly.

Ecologically significant boreal wildfires are often high intensity crown fires. They have traditionally only been stopped by forces of nature such as changing winds and rain. Fire has become a human hazard that results in policies more in keeping with safety than with the importance of natural regeneration.

Sometimes, prescribed burns or fires are used to reduce wildland fuel. These fires are lit deliberately to restore fire-dependent ecosystems or to reduce forest debris. Prescribed fires may also be caused by lightning and then be allowed to burn. Aboriginal people have been using such fires to fireproof their communities. The forest industry uses the fires to clear logging debris and prepare logged sites for planting. In the early parts of the 1900s railroads regularly burned right-of-ways to reduce the amount of dry fuel on the ground, as well as patrolling behind trains to prevent fire. Today, this is not so common. Farmers and municipalities practiced much the same fire prevention in the past but are much more hesitant to do so today.

Recently, prescribed burns have been used as a method of managing ecosystems. In a major policy change 20 years ago, Parks Canada decided that it wouldn't interfere in natural processes such as fire, insects and disease unless it had to - that is, unless people or neighbouring lands were threatened.

The provinces, meanwhile, conduct prescribed burns on a very limited basis. Timber is a valuable resource to many provincial economies. Few want to risk their land and homes for a prescribed burn that could pick up in high winds and turn into an uncontrolled blaze. As a result, prescribed burns have been opposed by landowners and outdoor-related businesses.

Forest fires are still generally viewed as negative, especially because they cause millions of dollars in damage. But Canadian and United States forestry officials are making efforts to change the public's perception. It is increasingly accepted that fire does have its place -- in a controlled setting, where lives and property are not at stake.

2.2 WILDLAND-URBAN INTERFACE

When lives and property are at stake, such as in the Hamlet of Chisholm, it poses a wildland-urban interface challenge. Wildland- urban interface is a term used to describe an area where various structures (most notably private homes) and other human developments meet or are intermingled with forest and other vegetative fuel types. Wildland-urban fire can occur in any vegetative type (forest or grassland) and pose a serious risk to human life and property. By choosing to extend our lifestyle and communities further into forested areas we become more exposed to wildfire.

Examples of recent wildland-urban fires in Alberta:

- 1997 Granum - Dry, windy conditions caused a December prairie fire to spread 35 km in four hours. Homes, farm structures and livestock were lost.
- 1998 Swan Hills - The 167,000-ha Virginia Hills Fire forced 2,000 residents to evacuate on two separate occasions.

As more developments and dwellings are constructed, damage to property by wildfires is an increasing problem in forested residential areas throughout Alberta and areas of the boreal forest across Canada. The threat of wildfire will always be imminent in areas of clustered and scattered residential development if prevention measures are not considered, planned and implemented in advance. Residents must be aware of the problems related to wildfire and preventative actions required to supplement the efforts of organized firefighting services.

Wildland-urban fire occurs when a fire burning in vegetation fuels gets close enough with its flames and/or firebrands (lofted burning embers) to potentially create ignitions of the residential fuels. Residential fire destruction is the major problem during wildland-urban fires, but homes that do not ignite do not burn. Recognizing the potential for wildland-urban home ignitions and preventing home ignitions is the principal challenge.

2.3 THE CHISHOLM FIRE

The following summarizes the Chisholm fire events from the time the fire was detected to the end of the fire. It includes initial attack suppression efforts and happenings in the community.

SRD uses the Canadian Forest Fire Danger Rating System to assess the risk of wildfire. It is largely reflective of weather conditions. Important indices in the system include the Buildup Index (BUI), which reflects total fuel available to burn; the ISI, the expected rate of spread if a fire starts; and the Fire Weather Index (FWI), a general index of fire danger. (*See glossary for these and other definitions.*)

All relevant indices were high in the fall of 2000, partly as a result of a three-year drought period. Very little snow during the winter and a dry spring resulted in an extreme risk of fire throughout parts of the province, including the region of the Chisholm fire. Fire bans went into effect on April 27, 2001.

Following the day-by-day summaries, are maps showing the location of presuppression resources, the location where the fire was first observed, and the perimeter of the fire at various times throughout its active burning period. The location of other fires in the area during the same period is also shown.

Day-by-Day Summaries

May 23

The fire was detected at 9:35 p.m. and reported to the Chisholm tower. An oil industry worker made an initial attempt to extinguish the fire. A crew of eight persons arrived from Slave Lake at about 10:40 p.m. and the fire was then some 10 ha in size. The fire was reported to have blown-up around 11:30 p.m. Additional equipment and firefighters arrived during the night and the total initial attack resources included 16 persons, three dozers and one water truck. By early morning, it was estimated that the fire exceeded 3,000 ha in size.

May 24

The fire continued to spread in hot, dry weather conditions. By noon it had jumped the river to the northwest and was about 4,300 ha in size.

The resources fighting the fire included 147 persons, 32 dozers, three air tanker groups and one fixed wing plane. The suppression efforts involved dozers and heavy equipment working on the south side of the fire and on the east flank, with air tankers attacking the north side of the fire and west of the river. At around 5 p.m., the Level 1 Overhead Team arrived and took control of what was by then a major fire.

May 25

The weather continued hot with variable winds. The fire continued to spread and moved about 3,500 metres (m) south by noon. It continued that spread to the south and east, and by midnight had gone another 3,000 m.

Late in the day, the fire also made a substantial run to the north and threatened the Hamlet of Chisholm. At 11:30 p.m., Chisholm was evacuated for the first time. A couple of outbuildings were burned. The resources involved in suppression activities included 180 persons, 36 dozers, two air tanker groups and two fixed wing planes.

May 26

The weather continued hot and the first of several weather advisories, warning of continuing extreme conditions, was issued. The size of the fire changed little during the day and Chisholm residents were allowed to return to their homes.

The suppression activities involved 197 persons, 56 dozers and one air tanker group. They were preparing a cat guard to the south of the fire, tightlining on the east flank, and applying heavy bucketing on the west side. About 50 firefighters and two dozer units and water trucks were working south of Chisholm.

May 27

Work continued south of Chisholm with about 48 firefighters and three water trucks involved. Total resources included 197 persons, 56 dozers and three air tanker groups. Fire advisories were issued in both the morning and afternoon, warning of critically dry fuels and a high spread index, due principally to expected winds. The fire again advanced toward Chisholm. At about 2 p.m., a second evacuation of the hamlet began with the residents either moving to the gravel pit on the edge of the settlement or leaving the area.

Individual farms on the south end of the fire and the Hamlet of Flatbush were also threatened and structure protection measures were employed. In the evening, the fire made a 12-km run to the northwest, toward Slave Lake, at a rate of some four km per hour.

May 28

This day was characterized by high winds and extreme fire behaviour. Fire advisories were issued in both the morning and afternoon, warning of critically dry fuels, a high spread index and a likely occurrence of blow up conditions.

A second Level 1 Overhead crew arrived from Ontario and took responsibility for the west side of the fire. The situation was complicated when two new fires started in the general area in the afternoon (fires 69 and 73). By evening, fire 73 had joined fire 63 (the Chisholm fire). Some 28 firefighters, 18 dozers and one air tanker group were involved with these new fires. Resources on the Chisholm fire included 224 firefighters, 81 dozers, two air tanker groups and one fixed wing plane.

By early morning, the fire was making another run toward Chisholm. Those who had stayed in the gravel pit were evacuated from the area beginning at about 9:30 a.m. and over the next couple of hours. Wind conditions were extreme and at about 11:00 a.m. firefighters were evacuated from the line. The fire overran the community of Chisholm in the early afternoon.

The fire continued to move rapidly to the northwest and in the evening crossed highway 2. The Town of Slave Lake was put on alert. To the north, parts of Hondo and Smith were evacuated. At 3:25 p.m., a state of local emergency was declared for the MD of Lesser Slave River No. 124.

In late afternoon, a cold front moved through the region and light rain began to fall in some areas. The fire was by then, about 108,000 ha in size.

May 29

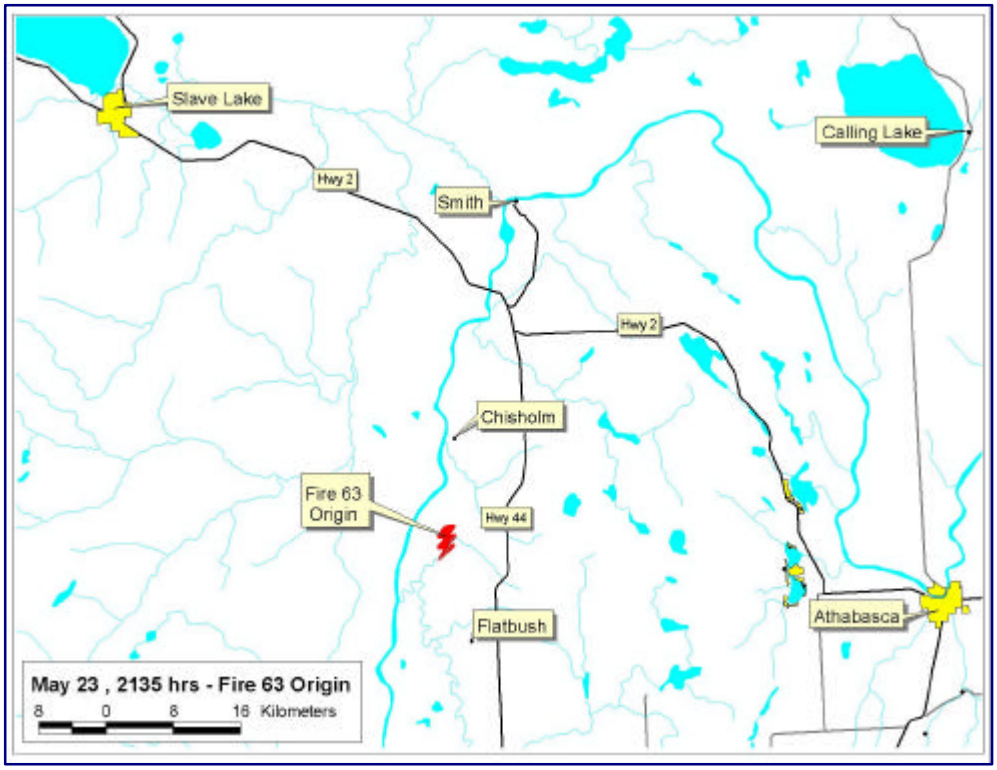
About 208 firefighters, 111 dozers, one air tanker group and two fixed wing aircraft continued firefighting efforts on the Chisholm fire. Efforts included construction of a fireguard in the northwest and structural protection activities at scattered residences and at Hondo.

May 30 and onward

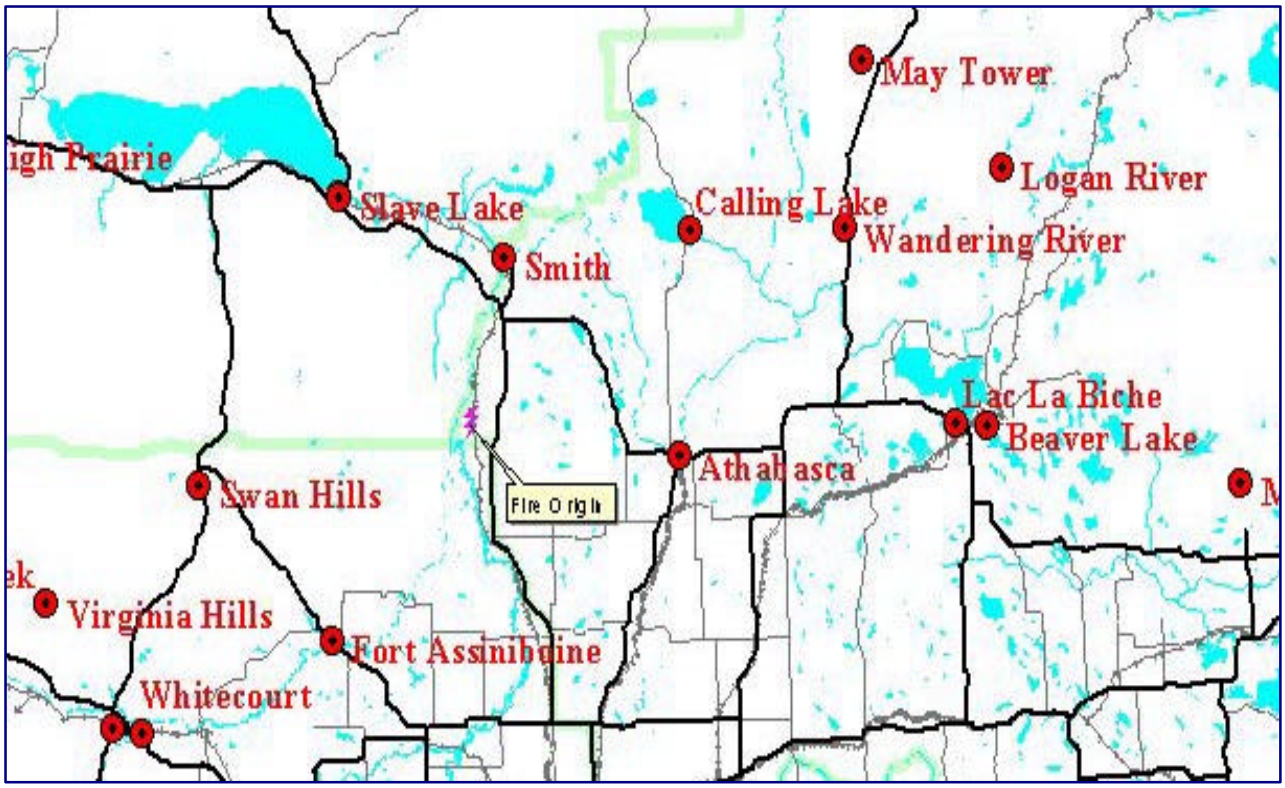
Firefighting and mop-up activities continued but the worst of the fire was past. The state of emergency terminated on June 4. Activities gradually moved toward reclamation of land disrupted by suppression activities as well as salvage operations.

The maps that follow are courtesy of the Chisholm Fire Documentation Team.

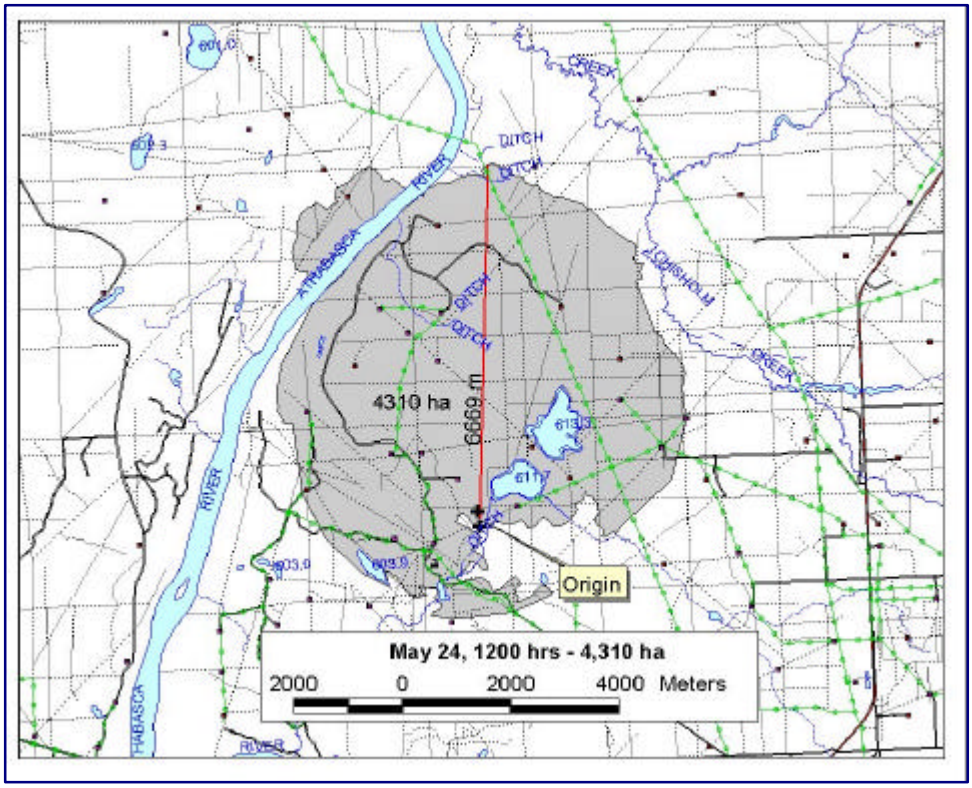
Fire Origin – May 23



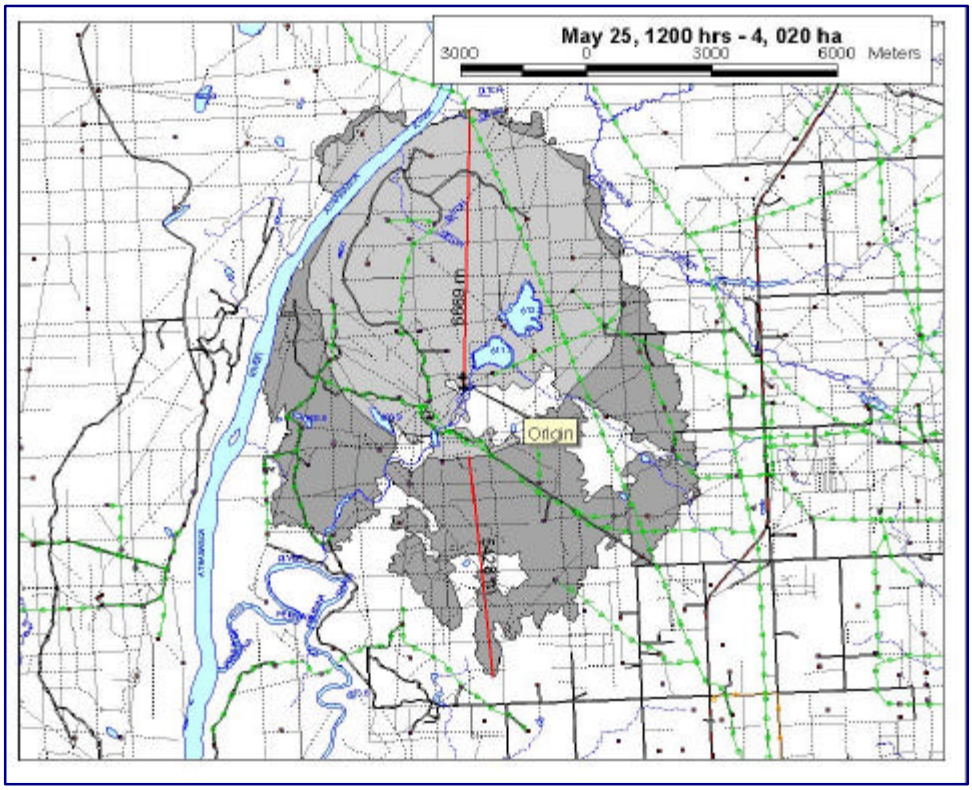
Location of Presuppression Resources - May 23



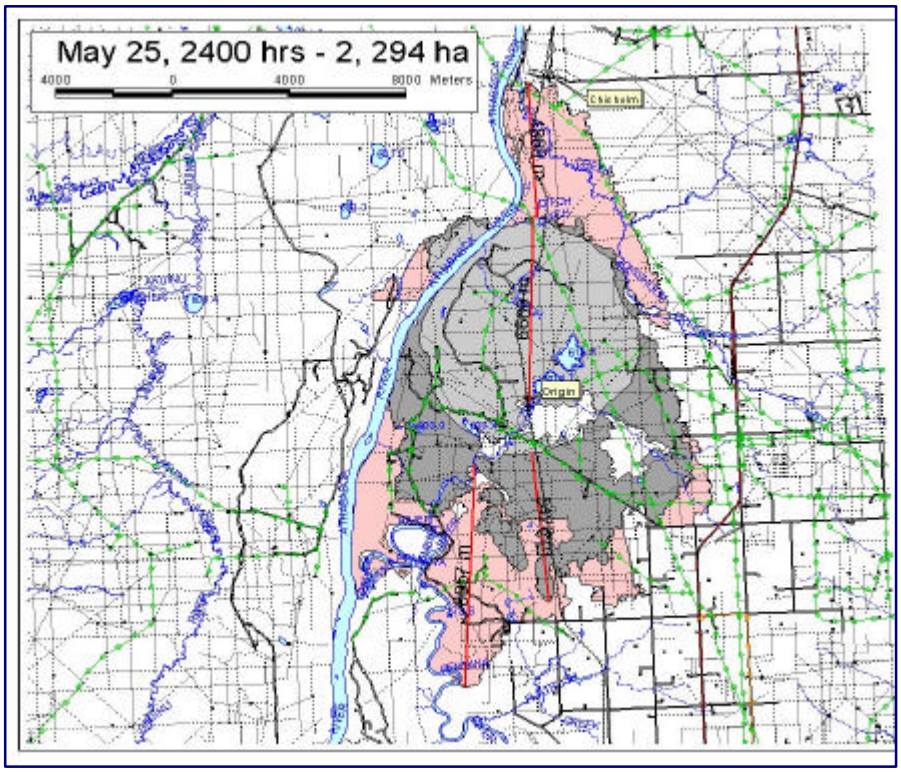
Chisholm Fire Perimeter May 24 1200 Hrs



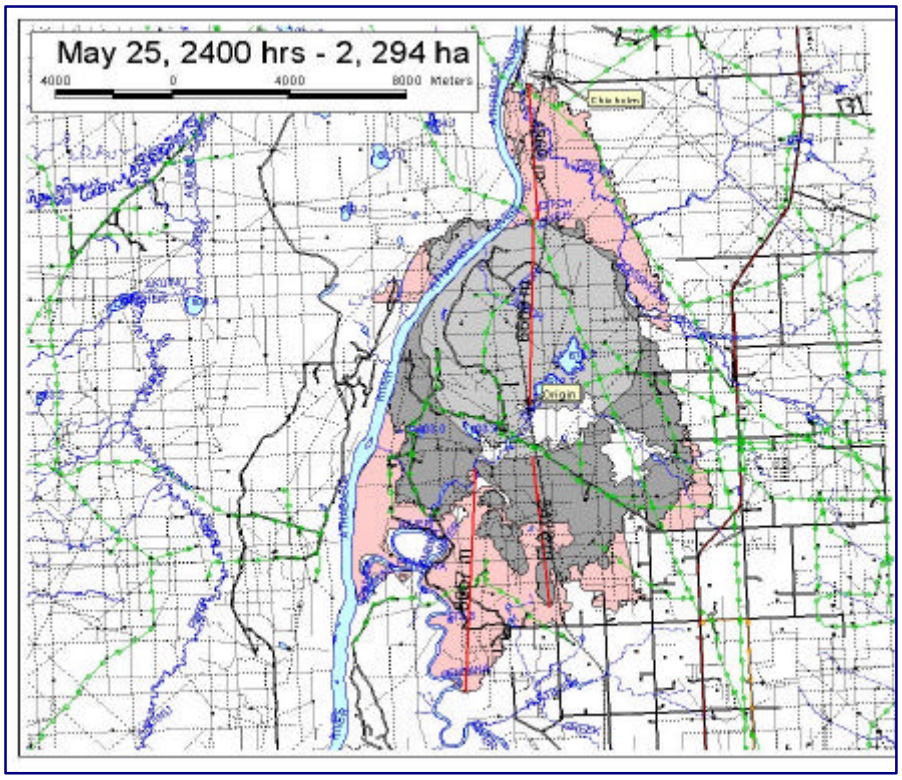
Chisholm Fire Perimeter May 25 1200 hrs



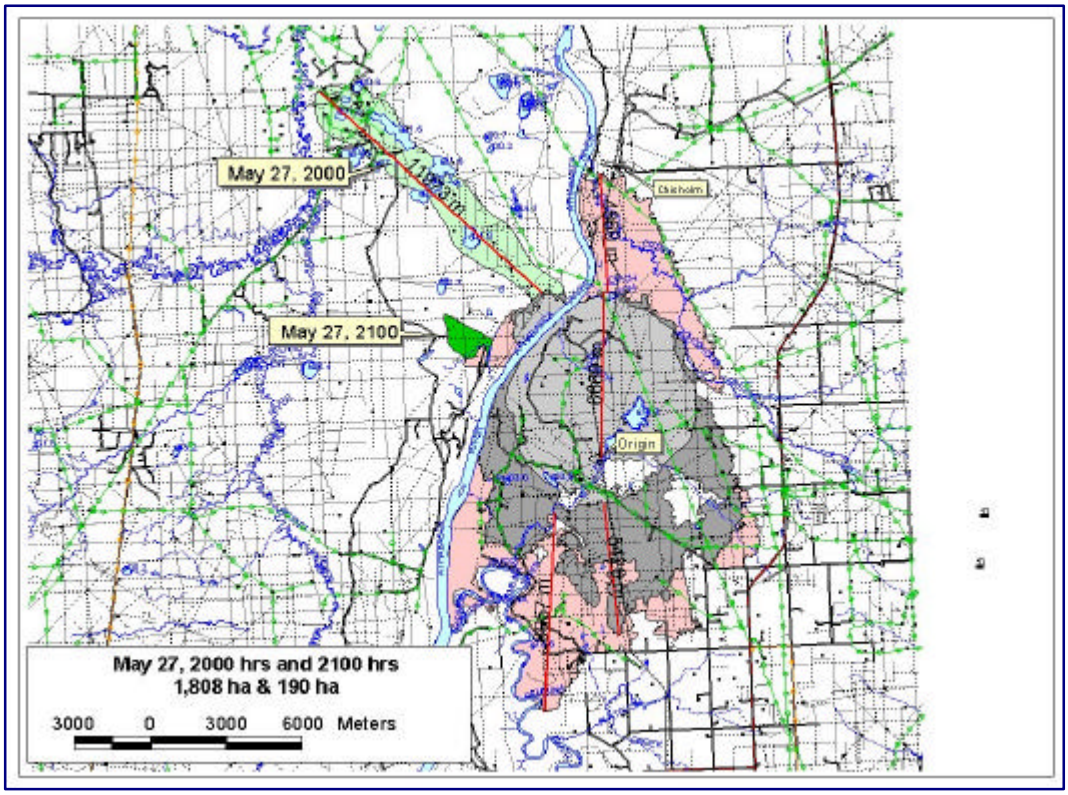
Chisholm Fire Perimeter May 25 2400 hrs



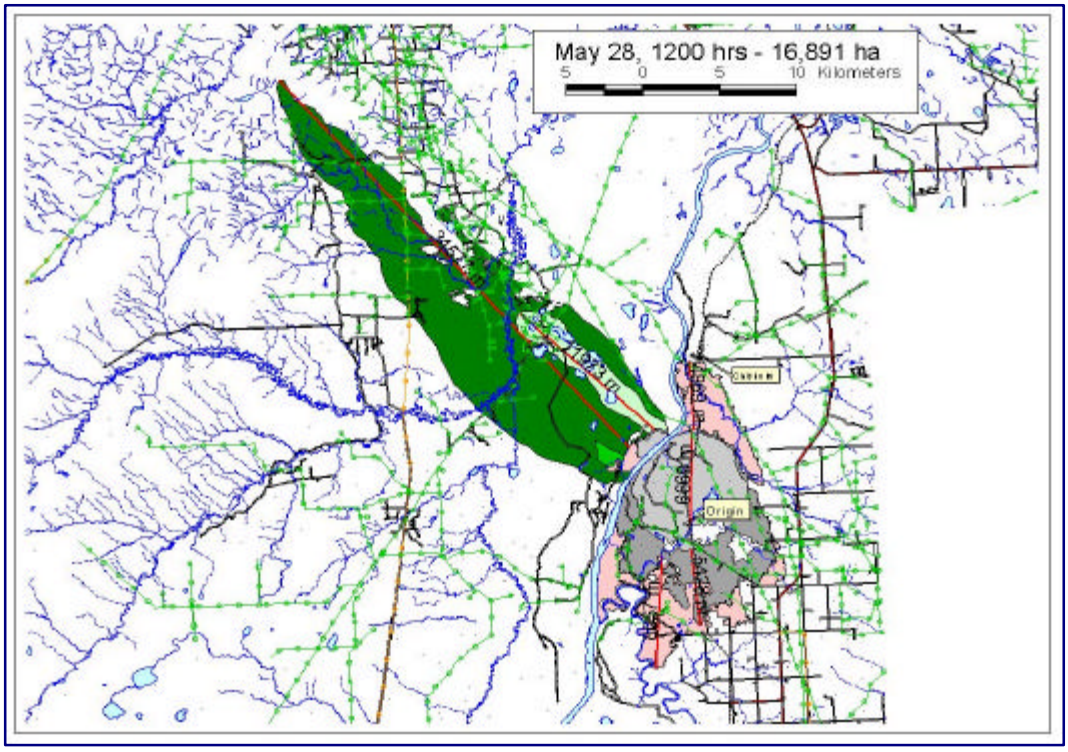
Chisholm Fire Perimeter May 26 2400 hrs – No change from May 25 2400 hrs



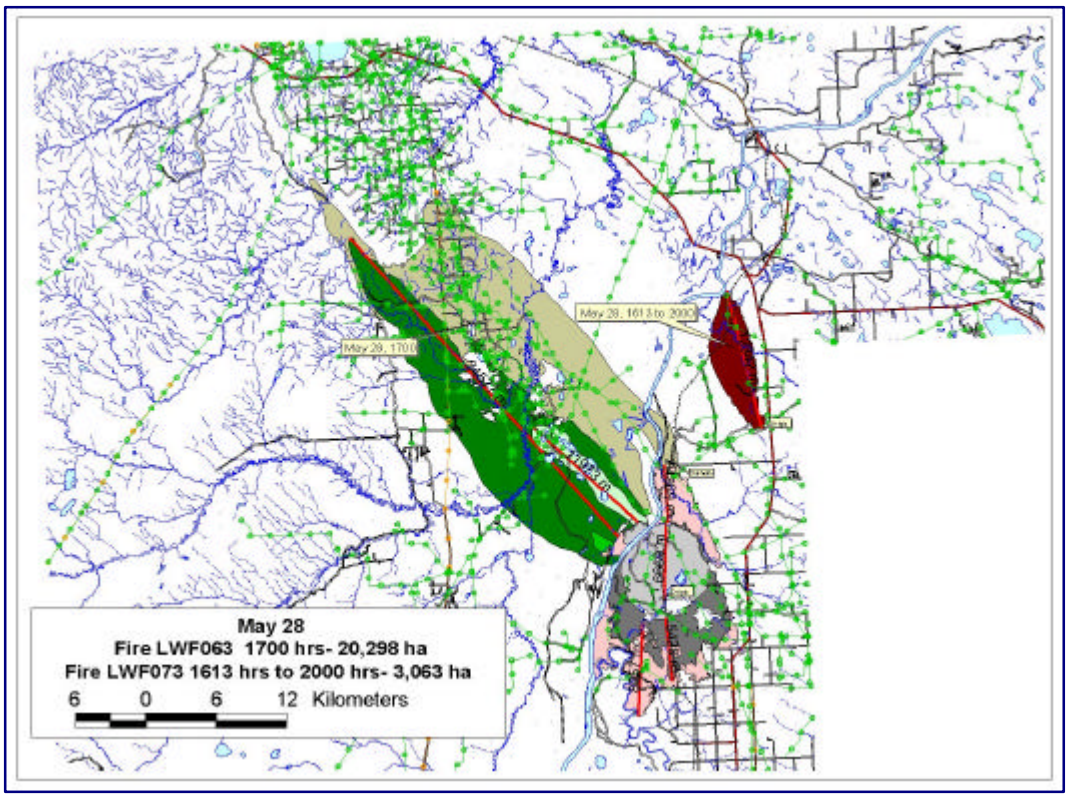
Chisholm Fire Perimeter May 27 2100 hrs



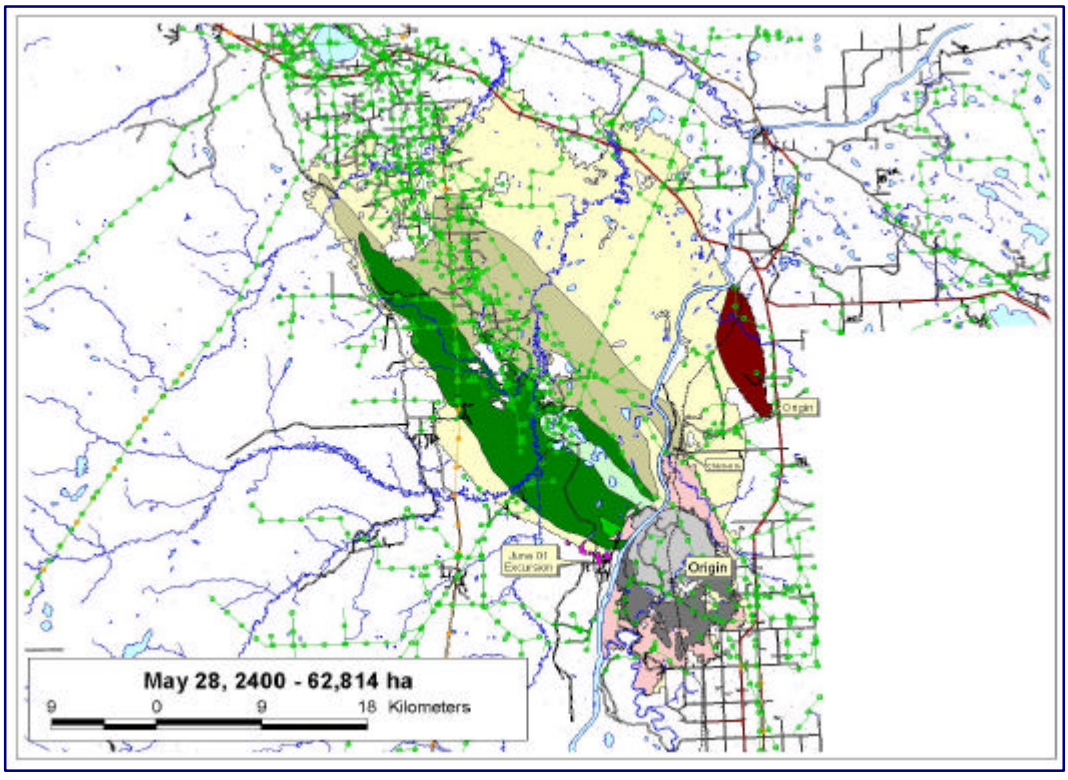
Chisholm Fire Perimeter May 28 1200 hrs



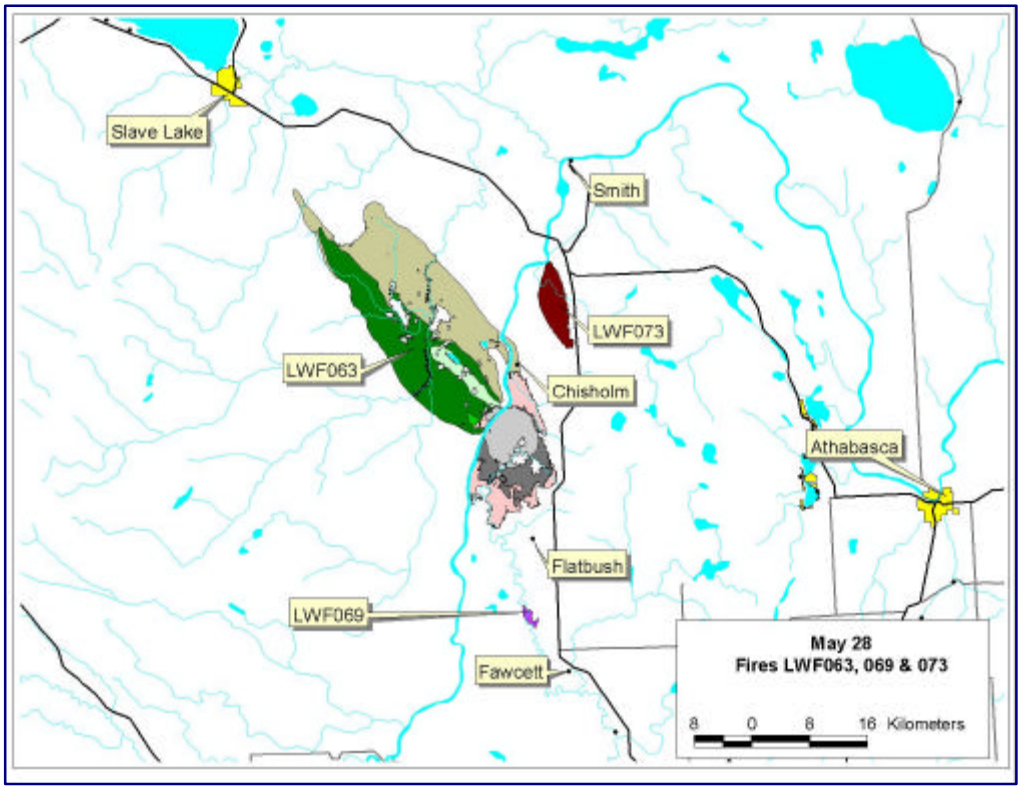
Chisholm Fire Perimeter May 28 1700 hrs

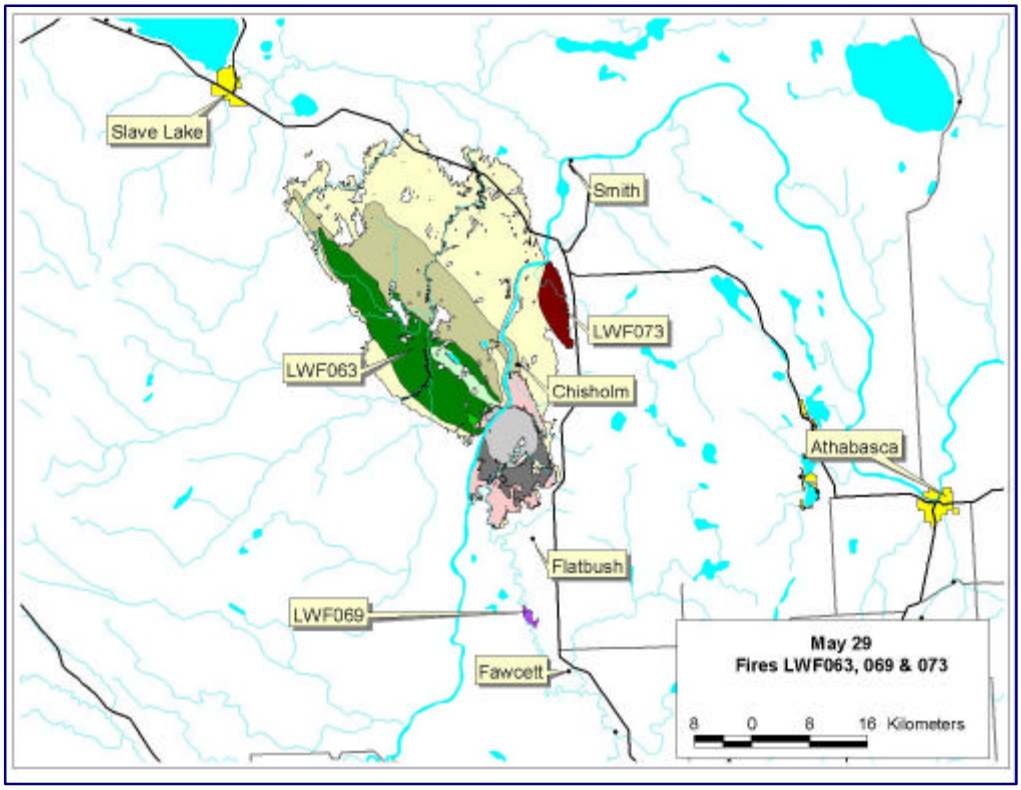


Chisholm Fire Perimeter May 28 2400 hrs



Chisholm Fire Perimeters May 28 and May 29

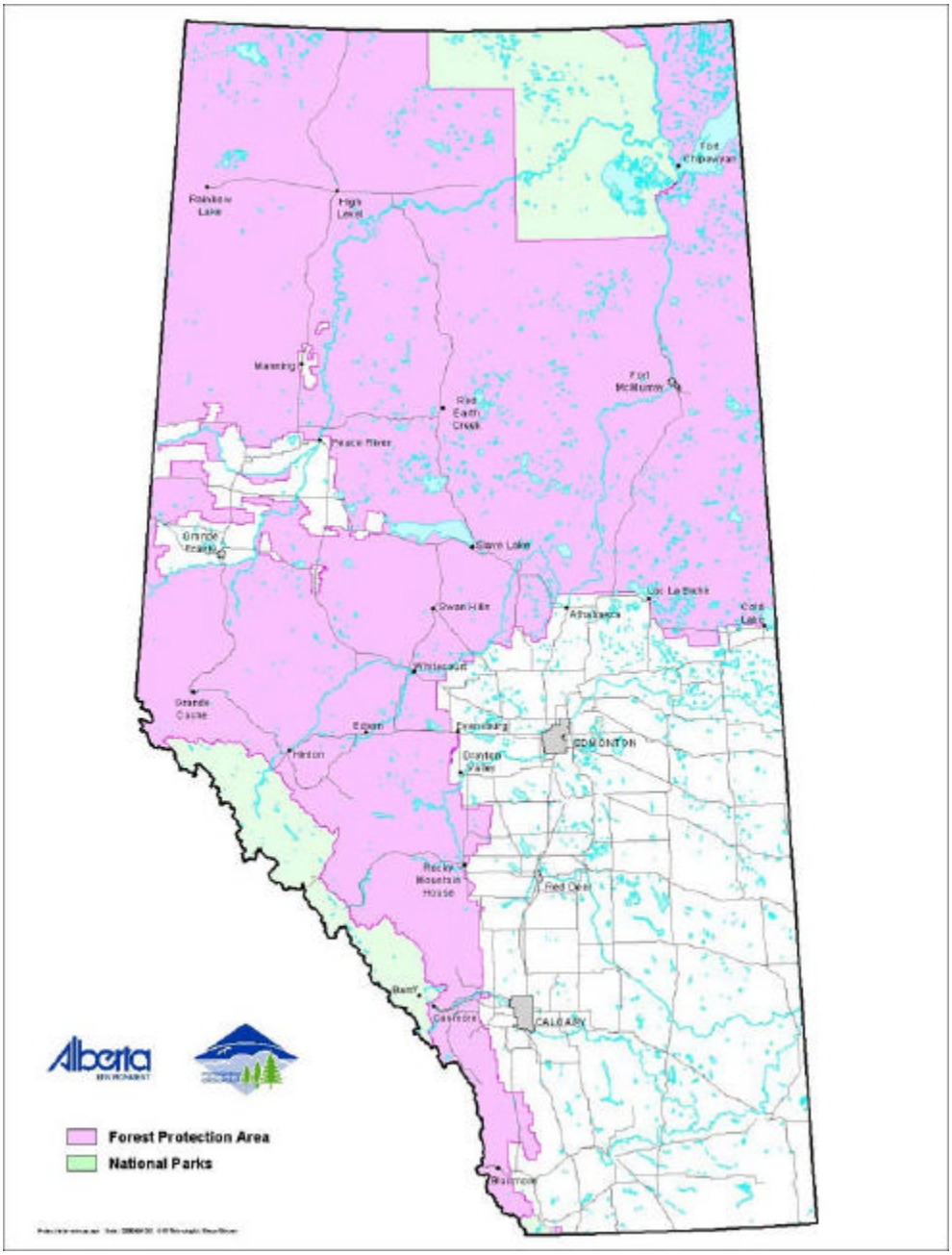




3.0 WILDFIRE JURISDICTION, POLICIES AND PROGRAMS

3.1 ROLES AND RESPONSIBILITIES

Alberta Sustainable Resource Development takes responsibility for preventing, detecting and fighting wildfires within the Forest Protection Area outlined on the following map.



Map of Forest Protection Area (pink area/darker area for gray scaled version)

Municipalities are responsible for dealing with fires within cities, towns and the villages in the Forest Protection Area. These responsibilities flow from the *Forest and Prairie Protection Act*, which applies to all lands in Alberta except lands in a city, town or village located in the Forest Protection Area; and any portion of lands in a municipal district located outside the Forest Protection Area. The mandate of SRD with respect to fires is to:

- Develop and implement programs to reduce the occurrence and significance of human caused fires.
- Develop and maintain an effective detection system.
- Develop and implement a system of preparing for fire suppression activities.
- Develop and implement systems for effective initial attack and substantial action on wildfires.

Various hamlets are located in the Forest Protection Area, including Chisholm, which is within the service boundary of the MD of Lesser Slave River No. 124.

On the basis of its review of the *Forest and Prairie Protection Act* and the *Municipal Government Act*, the jurisdiction with respect to wildfire-caused structure fires in hamlets is not clear to the Committee.

The *Disaster Services Act* allows the local authority of a municipality to declare a state of emergency for all or part of a municipality if the local authority is satisfied that an emergency exists (s. 18). Once declared, the local authority has broad powers including:

- the power to authorize or require qualified people to provide the assistance they are qualified to provide;
- the power to evacuate people;
- the power to remove livestock and personal property if it is or may be affected;
- the power to authorize a person who is implementing an emergency plan to access lands or buildings without want;
- the power to cause the removal or demolition of trees, structures or crops if necessary to reach the disaster area, prevent the disaster or combat it; and
- the power to procure or fix prices for essential supplies including food and clothing and to procure the use of any property, services, resources or equipment within Alberta for as long as the state of emergency continues (s. 16 and 21).

In Alberta, the fire boss makes recommendations to a municipality regarding any evacuation. Only the municipality however has the authority to invoke and put into effect the evacuation under a state of emergency declaration.

In a state of local emergency, a municipality's powers allow it to use qualified personnel and any services or resources available in Alberta. All members of the RCMP are peace officers and the RCMP has a duty to perform all duties assigned to peace officers in relation to the preservation of the peace.

The Supreme Court of Canada has confirmed that the police, at common law, have a duty to preserve the peace, prevent crime and protect life and property. Further, the duty to protect life is a general duty and is not limited to protecting the lives of victims of crime.

The Chisholm evacuations occurred before the declaration of a local emergency. However, the RCMP and officials of the MD and SRD realized they had no authority to physically remove people during the evacuations and used words like "strongly encouraged" and "enticed" in describing their evacuation efforts.

3.2 Policies and Programs

SRD has an extensive set of policies and programs to deal with all aspects of the more than 900 wildfires that occur each year (60 per cent result from lightning, 40 per cent are human-caused). This section of the report is not a compilation of all fire-related policies. These details are available in the legislation, regulations and policy documents listed in Appendix D. This section is an overview of the policies that exist, with some emphasis on those relevant in the Chisholm fire.

This overview of policies and programs is presented for the following functions and activities:

Planning and Presuppression Preparedness
Prevention
Detection and Initial Attack
Suppression
Wildland Urban Fire
Cooperation and Communications
Post Fire Activities

In addition, there are extensive policies identifying SRD positions responsible for each function and the required training for these positions.

Planning and Presuppression Preparedness

Presuppression preparedness is based on the principle that as the fire risk increases, additional firefighting resources should be strategically placed. The major elements of presuppression planning include:

- Identification of fuel types by region.
- Use of weather and fuel indices to predict the degree of risk and expected fire behaviour.
- Establishment of appropriate initial attack targets.
- Establishment of strategic initial attack centres.
- Identification of high value/high priority areas.
- Planning timely availability of resources and the required transport.

SRD policies deal with priorities, resource allocation and potential fire behaviour. Models are available to assist with fire behaviour, the results of which are used to ensure adequate suppression coverage and establish attack time targets. There are also extensive directives, guidelines and procedures to determine initial attack and suppression resource requirements depending on various weather and fuel indices and for essentially all elements of dealing with a wildfire.

Prevention

SRD policies and guidelines, based largely on weather and fuel conditions, provide direction and advice on matters such as public awareness, fire permits, fire guardians, closure orders and dealing with industries. Policies also exist for the use of prescribed burning as a forest management tool.

Detection and Initial Attack

Detailed detection guides establish policies for Tower Lookouts, including targets for detection and reporting and hours of occupation for different hazard conditions, times of the day, weather and visibility conditions. Policies also exist for ground and air patrols. All such policies are based on the principle that the greater the fire hazard, the greater the detection effort.

Initial attack guidelines deal with topics like the required initial attack resources and their positioning. Policies allow for modifications to plans in certain circumstances and offer guidelines for taking advantage of available resources and predicting the probability of containment.

Suppression

Policy directives, guidelines and procedures are in place to ensure the availability of resources and proper management and control of fires that escape the initial attack. The overall objective is to contain such fires in the first burn period, which is by 10 a.m. of the day following the escape. To accomplish this objective, policy directives and guidelines deal with items such as the makeup of Fire Management Teams, priority activities when a fire escapes and transition from initial attack to sustainable action.

Some of these guidelines are based on Head Fire Intensity as a prime indicator of potential fire behaviour and its impact on fire suppression activities. According to SRD, wildfire suppression priorities, in order of importance are:

- Human life
- Communities
- Watershed/soils
- Natural resources
- Infrastructure

Individual fire bosses are responsible for determining priorities during fire situations, weighing risks and making judgments.

Wildland-Urban Fire

Wildland-urban fire is complicated by the fact SRD is responsible for fighting fires in the Forest Protection Area while MDs have responsibility within cities, towns and villages. There are mutual aid type agreements between SRD and municipalities and a template has been prepared to formalize such agreements. Such a formalized agreement does not exist between SRD and MD 124 in which Chisholm is located.

There are few policy directives related to wildland-urban fires, however the *Partners in Protection Planner* provides advice and focuses on cooperation. Also the publication *FireSmart – Protecting your Community from Wildfire* advises individuals, communities, industries and forest officials on methods for cooperating to reduce the risk of fire losses. It deals with matters such as evaluation of hazards, strategies for wildland-urban fires, emergency response, training and community education.

Cooperation and Communication

SRD's approach involves working cooperatively with others involved in or impacted by wildfires. For example, a number of areas have industry liaison contacts that communicate extensively with SRD. Also, the Partners In Protection and FireSmart programs are based on cooperative efforts.

Regarding communications, the department's guidelines for communicating during wildfire situations (*Communicating Wildfire Information Revised February 2001)* deals with rural communities. The document states:

> *"The nature of rural communities can generate special problems. Unorganized areas have no representative body or bureaucracy that the spokespeople can use to disseminate information efficiently. The problem can be compounded by limited access to people's homes."*

The document advises that less formal communication methods may work well in rural settings, such as:

- An open house;
- Local community billboards (e.g., at a post office);
- Handbills or maps;
- Door-to-door visits at critical times;
- CB radios or Department radios;
- Information in several radio stations concurrently to secure coverage of a given area; and
- Effectively organized groups, such as a water user district or an advisory planning committee to network information.

SRD spends approximately $100,000 a year for advertisements on television, radio and in newspapers, and for the production of posters and pamphlets. The Wildland Fire Prevention Group deals with all aspects of wildfire prevention and is comprised of regional SRD offices, the PFFC and the Communications and Forest Evaluation Branch. SRD reports an apparent increase in demand for prevention items from user groups in major centres of Alberta. There do not appear to be detailed policy directions regarding communication with impacted or threatened members of the public during a wildfire. The approach tends to be passive (wait for requests for information) rather than an active attempt to inform the public about the wildfire, its behaviour, what is being done and what is expected.

Post Fire Activities

Aside from one policy requiring the restoration of fire construction areas to provincial reclamation standards, there does not appear to be extensive policy directives for this function.

4.0 KEY ISSUES AND RECOMMENDATIONS

While the concerns or issues identified by the Committee are interrelated, the Committee sees each of them as important enough to be dealt with separately.

4.1 COMMUNICATIONS

Generally, people living in wildland-urban areas have limited knowledge of wildland fire, and may not fully appreciate its potential intensity, the limits of fire suppression, their responsibilities and the roles and responsibilities of government and non-government agencies.

Wildland-urban fires affect several jurisdictions, such as municipal and wildland fire agencies, police, social and health services, utilities, government departments, and private industry. To manage such an incident effectively, interagency information sharing between agencies and with those most directly affected is critical.

While communications touches all aspects of fire management, this section focuses on communication issues before and after the Chisholm fire with local residents and between agencies, such as the MD. (Section 4.2 deals with communication issues faced by the command team during the fire incident.)

Key Issue

The Committee believes the following communications issues emerged during the Chisholm fire:

- education about wildland-urban fires and the responsibilities of all those involved and affected, before any major fire event; and
- timely communication with affected individuals during and after the fire.

Examples of the Issue in Chisholm Fire

Education

Many individual owners did not understand their responsibility when choosing to live in a forested area and did not understand some of the personal efforts they could make to be "fire smart." In fact, the department held a FireSmart meeting in Smith in January 2001 but only four individuals attended. None were from the Flatbush or Chisholm areas. This meeting was advertised in a local newspaper, however there appears to have been little attempt to reach Chisholm residents in a more direct and personal way as described in the department's communications guidelines.

Residents said they needed more understanding of the risks of wildfire and the policies regarding the need for insurance. Residents suggested they would have carried insurance on fences, outbuildings and homes had they been better informed. They did not understand the role of Disaster Services and believed they would be covered in a wildfire.

It seemed there was also a general lack of awareness regarding the powers available under a state of emergency. The RCMP indicated to the Committee that forced evacuations were limited to places where children were involved or when RCMP members felt that the resident may have not been sufficiently able to look after their own welfare due to mental distress.

Timely communication with directly affected people

Some land and cabin owners reported they were not contacted or warned of the fire by either the MD or SRD. These individuals were not at that location at the time of the fire but did suffer extensive losses from the fire. These owners indicated they could have taken actions if they were notified.

During the fire, residents seemed confused about the evacuation protocols and whether they were required by law to leave their homes. For example, residents did not have adequate information about evacuation procedures before this fire nor during the Chisholm fire evacuations, even though there was a fire camp in the local gravel pit. The communication that did occur during the evacuations was inconsistent. Conflicting information as received by Chisholm residents included: their homes would be safe, would be sprayed with foam, would be watered by the helicopters.

Residents of Chisholm reported learning that the community burned and some homes were destroyed through radio or television. Apparently, neither the MD nor the department notified residents even though residents said they provided contact information during the evacuation.

Opportunities for Improvement

There are opportunities for SRD to improve its communication between and among those involved and affected in wildland-urban fires through comprehensive pre-incident communication planning. Seizing such opportunities will help ensure all those involved and affected by wildland-urban fires understand their roles and responsibilities before a major fire incident happens.

The Committee believes two main areas must be addressed: education programs aimed at those most directly affected by wildland-urban fires and the establishment of protocols or tactics for ensuring timely communication with those most directly affected during and after an incident.

SRD certainly has a great deal of communication activity in place such as advertisements, posters, pamphlets, videos and a website. However, SRD needs better ways of informing rural residents of forested areas of the potential risks of fire and that they need to work to reduce the ignitability of their structures. The previously mentioned materials are useful, but they should be supplemented with personal contact and direct interaction. This includes, for example:

- Hazard assessments conducted by fire officials with homeowners.
- Actively engage residents in education efforts that communicate homeowner and community responsibility (for example, owners could be required by the municipality to have sprinkler systems or a system to water their property before building in the forest). This effort will increase the likelihood of a partnership approach to fire management before, during and after an incident.
- Education programs run by community-based groups allowing information sharing among neighbours and friends, including survivor stories.
- Systems to ensure those most affected are communicated with first during an incident (i.e. notifying people personally that their property has been affected).

Recommendation 1

SRD take the lead in ensuring communication is a top priority before, during and after fire events by developing and implementing a comprehensive communications plan. The plan should include:

- strategies and tactics to actively communicate with Albertans most directly affected by wildland-urban fires, including a media relations component;
- education on roles and responsibilities for different stakeholders, including actions property owners should take to reduce the risk of loss;
- allowances for more personal communication methods; and
- details on interagency communication before a major fire incident.

4.2 UNIFIED PLANNING AND ACTION

In Canada, management of disasters is a municipal responsibility, and each municipality is required to prepare a Disaster Management Plan. Currently, disaster planning uses the Emergency Site Management /Emergency Operations Centre (ESM/EOC) system. There are many similarities with the American Incident Command System (ICS), especially at higher levels of response.

In Canada, an "incident" is an event that may be relatively common, for which emergency plans exist. This type of emergency does not usually require the direct involvement of more than one agency. In terms of size, the field operations ("Emergency Site Management") are usually larger and more complex than the Emergency Operations Centre. Interagency meetings or briefings may be held to communicate information, but generally do not involve sharing of decision-making.

A "disaster" is a rare event that may include problems for which emergency plans did not anticipate; requires the involvement of multiple agencies; affects multiple jurisdictions; and is beyond the ability of a single agency to manage. At this level, the Emergency Operations Centre may be a larger operation than the actual Emergency Site Management. In the American ICS system, this level is called "Unified Command."

Provincial Forest Services in Canada currently use a system of fire line organization that is similar to lower levels of ESM/EOC and ICS. The differences are largely in terminology.

Key Issue

A premium is placed, in situations like the Chisholm fire, on swift, efficient communication and coordination about fire protection actions between all the players.

The Committee believes that this active communications interchange is at the heart of effective command in complex situations. More coordination efforts were needed in managing the Chisholm incident. The Committee has identified as a key issue, the need to integrate the various protection partners into a more coordinated command structure.

(It is important to note that communication as used in this section of the report refers to the discussion of strategies used by the incident management team as it does its work. As such, it cannot be dealt with in detail in the communications plan referred to in Recommendation 1, except to say that communication command relationships need to be created and agreed to by the parties involved.)

Examples of the Issue in Chisholm Fire

In reviewing the Chisholm fire, it is evident that coordination of complementary protection capabilities is essential for dealing with layers of complexity. MD 124 set up the ESM/EOC system to respond to fire emergencies (structure protection) in the Flatbush and Chisholm areas. The EOC was located in the fire hall in Slave Lake. SRD used fire line organization (fighting wildfire) and an industry liaison person based in the Chisholm fire camp. On May 28, an Area Command Team and additional overhead team were added due to the increasing complexity of the situation. It appears interaction between the EOC office and the fire base/area command office was not sufficient enough to keep information flowing in a timely manner.

There appears to have been a communications problem between the municipal disaster services and the command hierarchy. Correct and timely information about the fire was not always available and this caused some confusion. At one point, evacuations and road closures were being planned near Slave Lake on reports that the fire had jumped the road, whereas it turned out later that the fire was contained in that area. SRD reported the presence of an MD representative at some of the briefing meetings and assumed he would be the one reporting back to local representatives.

Residents reported that the MD did not come to the community with water or a fire truck. They said that in 1998, SRD left hoses and pumps for the use of residents. This was not done in the 2001 Chisholm fire. In follow-up discussions in the group meetings, SRD suggested it had requested a truck but the MD indicated it had not been asked. Indeed, the MD stated that it had volunteered equipment. This is an example of a breakdown in communication among command personnel.

Some of the concerns just noted may relate to the lack of clarity as to the responsibility for fighting wildfire-caused structure fires in hamlets within the Forest Protection Area. As indicated in Section 3.1, the Committee believes this lack of clarity should be addressed.

Those responsible for wildland suppression in the Chisholm fire faced the daunting task of dealing with fire under severe drought conditions. These conditions resulted in severe and active fire behaviour through both the day and night. An incident like the Chisholm fire, burning under those conditions and with the behaviour it displayed, is a massively complex operation where many of the decisions are plagued by uncertainty of what is coming next. Adding wildland- urban protection (both dispersed and clustered development) with tactical differences from fighting wildfire, adds exponentially to the complexity of the event.

Opportunities for Improvement

To effectively manage a fire incident as complex as the Chisholm fire, an interagency information sharing and decision-making system is required. Such a system would ensure that efforts and information are integrated and coordinated (a coordinated command structure). The system would help manage the inherent complexity associated with the incident by ensuring specific attention to each different strategic and tactical requirement (wildland firefighting, wildland-urban firefighting, working with property owners, etc.).

Face-to-face contact at a command centre is the best way to facilitate information flow. This ensures the timely request and sharing of information with all partners at once, including clarification of roles and responsibilities.

A coordinated command where all players are brought to the table and specialists are assigned for operations that are significantly different, would improve information sharing with the public and the media. Examples of improved coordination include:

- regular meetings with those at risk and involved that would report what is happening and what is being done;
- better handling of evacuation in terms of sharing information and making clear whether the evacuation is mandatory or voluntary – perhaps using a command post concept; and
- improved organization for handling media relations, such as a primary spokesperson/communications consultant in the area and appropriate communication staffing levels (i.e. one consultant in the area and one in Edmonton).

Recommendation 2

SRD implement means of improving command and resource coordination with MDs, the RCMP, local industries and property owners. This can be accomplished by establishing an integrated and coordinated command system to ensure interagency information and resource sharing and decision-making during complex wildland-urban fires.

The key point is not in implementing a formal program, but in recognizing the benefits of command collaboration and bringing the appropriate people to the table. Coordinated command can be established within the context of the mutual aid agreement between SRD and MDs. The agreements are reviewed and revised annually at spring meetings between the signature parties. All protection entities and their complementary roles are outlined in these agreements. SRD and MD 124 have not yet formalized its mutual aid agreement.

A related additional action that would be appropriate in some situations is the establishment, within the command structure, of a division chief for those elements adding complexity to the task. An example would be assigning a command responsibility for wildland-urban fire protection (dispersed and clustered) to individuals who have no wildland firefighting responsibilities on that incident.

This would enable the command team to focus on the strategic aspects of the task, while those assigned special responsibilities could focus on the tactical aspects of structure protection. The specialists, who would have a presence at the command table, could serve as (or appoint) contacts with the public to share accurate and timely information with people whose property may be at risk. (Wildland-urban protection is dealt with further in section 4.3.)

Combined with the other recommendations of the Chisholm Fire Review Committee, a coordinated command would speed information and data gathering, improve discussions of the different kinds of protection action and facilitate decision making for the overall protection task. Assigning special responsibilities (e.g., wildland-urban protection) to individuals would reduce task complexity for members of the command team by having each person focus on one type of fire protection, and its appropriate set of tactics.

4.3 COMMUNITY PROTECTION

Understanding how homes ignite during wildland-urban fires provides the basis for assessing the potential for home ignition and thereby effectively mitigating wildland-urban fire ignitions. Fires do not spread by flowing over the landscape and high intensity fires do not engulf objects, as do avalanches. Fires spread by meeting the requirements for combustion—that is, a sufficiency of fuel, heat and oxygen.

In the context of severe wildland-urban fires, oxygen is not a limiting factor so this type of fire spreads according to a sufficiency of fuel and heat. Homes are the fuel and the heat comes from the flames and/or firebrands of the surrounding fires. Recent research indicates that the potential for home ignitions during wildfires, including those of high intensity, principally depends on a home's fuel characteristics and the heat sources within 30-60 m of a home (reference wildland-urban fire research at www.firelab.org). This relatively limited area that determines home ignition potential can be called the *home ignition zone*.

During a wildland-urban fire a home ignites from two possible sources: directly from flames (radiation and convection heating) and/or from firebrands depositing directly on the home. Even the large flames of high intensity crown fires do not directly ignite homes at distances beyond 60 m. This means that fires adjacent to a home do not ignite it, unless the fire is within 60 m. Additionally, firebrands can only ignite a home through contact. Thus, the home ignition zone becomes the focus for activities to reduce potential wildland-urban fire destruction. This has implications for reducing home ignition potential before a wildfire as well as implications for emergency wildland-urban fire response strategy and tactics.

One might argue that preventing the occurrence of wildfires would prevent wildland-urban fire destruction. However, the 1998 Alberta Fire Review (KPMG Report, XIII, B, p. 114) states:

> *"Wildfire will always occur on the forested landscape and will always have an impact on people, property and resources. The goal of the program is to minimize the impacts, not to eliminate the impacts."*

Thus, it is not reasonable to form management expectations for the non-occurrence of wildfires. This implies that communities will be impacted by wildfire, i.e., wildfires will continue to encroach on communities.

Wildland-urban fire emergency strategy and tactics differ from either the standard wildland or the standard urban fire suppression practices. Wildland fire suppression largely attempts to keep a fire from spreading beyond its current location. That is, keeping the wildfire away from a valued area protects the values at risk. Urban fire suppression initially addresses life safety (mainly building occupants) and then fire containment within a portion of the structure and/or prevents adjacent structure involvement. Neither the wildland nor the urban suppression practices typically provide for home ignition potential reduction given an encroaching wildfire.

Wildland-urban strategy and tactics assume the wildfire may pass through the residential area without containment. The wildland-urban strategy and tactics principally focus on preparing the home for the wildfire by reducing the potential for home ignition within the home ignition zone.

Ideally, most preparation should occur before a wildfire occurs; however, given the time, significant reductions in ignition potential can occur after the fire has started but before wildfire encroachment. Then, if possible, the wildland-urban firefighting resources suppress ignitions that threaten the structure during and after the wildfire approach.

Although SRD does not have any structure fire suppression responsibilities in the absence of a wildfire, it is involved when wildfires encroach on scattered homes and small communities. SRD fire protection policy sets specific priorities - public safety is the first priority followed by property and communities. The 1998 Alberta Fire Review (KPMG, XIII, E, p. 119) recognizes SRD wildland-urban fire protection involvement with the following statement:

> *"Alberta has 321 communities located in or near provincial Crown forests and the subsequent demands for protection are significant."*

There is limited recognition for wildland-urban fire protection in SRD's fire suppression policy and management activities. The Committee found this is reflected in SRD having little or no wildland-urban fire training, cross training with urban fire protection organizations and wildland-urban fire experience. The *FireSmart Partners in Protection Community Planner* provides the main wildland-urban fire resource in Alberta.

Key Issue

The committee believes a key issue arising from the Chisholm fire is whether fire suppression teams on future wildfires can be more effective in protecting property and communities. The Committee's review of the Chisholm fire respecting the wildland-urban fire aspects indicates that changes can provide for more effective community protection.

Examples of the Issue in Chisholm Fire

Although homes and outbuildings were destroyed during the Chisholm fire, the lack of wide spread post-fire destruction within the Chisholm hamlet has created questions regarding the appropriateness of the community fire protection efforts. The Committee recognizes an analysis of decisions and actions for protecting Chisholm must consider the overall real time context. However, the Committee believes that unrecognized opportunities existed for more effective community protection.

The suppression team's effectiveness in protecting Chisholm was influenced by a number of conditions and activities. The fire behaviour conditions remained severe during the three-and-a-half days of the Chisholm fire's approach and burn through Chisholm. This was indicated by continual high spread rates and crown fires during moderate to high winds, high intensity burning during the nighttime and morning hours, aspen and poplar forests that did not provide suppression opportunities, and spot fires that escaped across control lines. A crew fire entrapment occurred on the eastern flank on May 27, perhaps indicating an inability to assess and anticipate local fire behaviour conditions. These events suggest significant uncertainty as to the control line effectiveness in keeping wildfire away from Chisholm.

Protecting property and communities is the second SRD fire protection priority after life safety but no community protection task group was assigned to identify the specific characteristics of the Chisholm home ignition zones that could lead to effective protective actions. Chisholm has large open areas and hardwood patches that kept high intensity fires distant from homes.

Observations from the Events Chronology provided by SRD suggest that the homes burned down after the wildfire had passed the area. The post-fire evidence indicates that the surrounding high intensity wildfire did not ignite homes in Chisholm. The homes likely ignited either directly from firebrands or from low intensity surface fires spreading to the homes within the community.

In the Chisholm fire, wildland-urban strategy and tactics were not used. Even though the Rapid Fire wildland-urban suppression group was at Chisholm, the strategy and tactics remained in the wildland fire suppression mode for community protection. Rapid Fire did not deploy sprinkling kits or conduct other mitigations to reduce home ignitability. At various times, Rapid Fire resources were used to support wildland fire containment lines. Although water-sprinkling systems had been deployed in Chisholm during the 1998 Mitsue Fire, none were deployed in Chisholm in 2001. The fire suppression resources did not use the recommendations of the *FireSmart-Protecting Your Community from Wildfire* guide (Emergency Measures, p. 4-25) and they did not advise residents to implement these recommendations (that includes sprinklers). On their own, one or two residents watered their home site.

Severe fire behaviour indicated limited control capability; however SRD staff believed they had the Chisholm fire contained along the north east flank. Given a cat guard had been constructed, crews had extinguished the fire's edge and with the wind direction, staff believed the fire would not affect the Hamlet of Chisholm. This reliance on wildland fire suppression tactics to keep fire away from Chisholm failed when fire jumped control lines on the morning of May 28 during forecasted high winds. With severe fire behaviour spreading toward Chisholm, the wildland-urban fire suppression group had to be evacuated without the time to use their foam fire suppressant resources.

Opportunities for Improvement

Had the Chisholm fire suppression team dedicated a knowledgeable wildland-urban "sector boss" with wildland-urban resources to the Chisholm hamlet, more effective community protection could have occurred. Wildland-urban fire expertise might have evaluated the site-specific conditions and identified the opportunities offered by the open areas that distanced homes from high intensity crown fires. It might have identified hardwood patches that decreased fire intensity but would not prevent fire spread under those severe conditions. It might have identified ignition factors at specific homes and in cooperation with residents, if available, mitigated those factors to increase home ignition resistance. Experienced wildland-urban fire personnel might also have assisted in evaluating the site-specific conditions regarding their need to evacuate the area for life safety of residents and fire protection personnel.

Recommendation 3

SRD recognize the need for wildland-urban strategy and tactics separate from those of wildfire suppression. It is recognized that wildland-urban strategy and tactics involve pre-fire preparation to reduce ignition potential within the home ignition zone, and fire response tactics that focus on reducing the potential for a structure to ignite from wildfire.

The implementation of this recommendation requires a well understood, coordinated and communicated definition of responsibilities for the various activities that will prevent wildland-urban fire destruction. These responsibilities range from the homeowner to the MD to SRD. Although SRD cannot have total wildland-urban fire protection responsibility, it has the principal fire suppression role for provincial Crown forests that contain or border communities. Thus, SRD

must recognize and implement wildland-urban strategies and tactics where communities are a concern.

The fire suppression teams must then adopt a wildland-urban approach for residential areas affected by wildfires. Wildland-urban areas would be operated separately from but in coordination with the wildfire. The wildland-urban team and protection resources would consist of cross-trained specialists drawn from multi-agency resources through mutual assistance agreements.

It should be well understood that wildland-urban strategy is a different approach. The wildland-urban fire personnel require a deeper understanding of potential fire behaviour and how home ignitions occur—not just a different set of equipment.

The Committee wants to emphasize that efforts to produce ignition resistant homes occur well before the wildfire threat. Although SRD can facilitate such efforts as a partner, the homeowner must take principal responsibility for a FireSmart home.

4.4 Presuppression Planning and Suppression for Existing and Anticipated Extreme Fire Behaviour Conditions

Successful presuppression planning and suppression requires the ability of managers to understand and predict fire behaviour. Fire behaviour depends on the interaction of fuel, weather and topography.

Fire behaviour is described by outputs of the Fire Behaviour Prediction (FBP) System, such as rate of spread, crown fraction burned, fuel consumption per unit area, and heat released per unit time. Knowledge of potential fire behaviour allows managers to hire and deploy extra resources in a strategic fashion, provide for safety of fireline personnel, and choose strategy and tactics most suited to the situation. Fires under similar historical conditions (fuel, weather and topography) may also be used to validate fire behaviour prediction.

Key Issue

Drought over several years, a lack of winter precipitation, and dry spring weather contributed to extremely low fuel moistures in large and medium forest fuels. These conditions were reflected in extremely high Drought Code, Duff Moisture Code and Build-up Index. As a result, forecasters issued fire danger advisories, and substantial resources (crews, equipment and aircraft) were hired to supplement base level preparedness.

The Committee believes that a key issue is whether existing procedures for fire prevention, detection, initial attack, transition attack and sustained attack were reviewed and altered in view of the extreme drought conditions. In hindsight, it appears that knowledge of the extreme conditions was not always used and there were missed opportunities to prevent or limit the spread of the fire before it became unmanageable. This perception seems to be held by many of the participants in the outreach process.

Examples of the Issue in Chisholm Fire

While 41 per cent of all fires are human-caused and can occur at any hour of the day, detection was limited to a 12-hour shift. It would seem that additional observers, firefighters and pilots may be needed or shifts staggered to provide longer coverage during extreme conditions.

The FBP model apparently predicted nighttime fire growth, but managers did not anticipate and adjust strategy and tactics accordingly. As a result, the spread during the first night (May 23) and first run to Chisholm (May 25) were somewhat of a surprise.

Overhead team members were uncomfortable with decisions such as when to deploy crews and when it was unsafe to do so, and what tactics to use when building dozer lines. Perhaps these issues could have been discussed before the Chisholm fire in light of the extreme drought.

Opportunities for Improvement

Fire managers now have the opportunity to review standard operating procedures in light of the known weather conditions and behaviour of the Chisholm fire and similar historic fires. Attention should be given to the use of forest closures or restrictions, improved detection and prevention particularly of human caused fires, and appropriate strategy and tactics during extreme fire behaviour. There is an argument for reviewing the number and location of forest districts, and district ranger offices to provide more local knowledge of terrain, availability of local equipment, and improve local communication with stakeholders, and communities. Local ranger offices and staff may be key to implementing many of the recommendations of the *Partners in Protection FireSmart Community Planner*.

Recommendation 4

During existing and anticipated extreme fire behaviour conditions, SRD should use other strategies in addition to resource build-up to reduce the occurrence, or impact of large fires.

4.5 The 1998 Fire Review Report

Following the 1998 fire season, a comprehensive report was prepared which reviewed the entire protection program for Alberta's forests and made 56 recommendations. The Committee, as part of its review of the Chisholm fire, reviewed the 1998 report and a status report on the recommendations implemented to date.

The Committee notes that many of the recommendations dealt with issues of importance to the Committee's review of the Chisholm fire. (For example, recommendations 3, 20, 22-26, 30-32, 35, all relate directly or indirectly to communications (section 4.1), unified planning and actions (section 4.2) or community protection (section 4.3). Similarly, several recommendations in the 1998 report, such as 5-7, 18 and 21, relate somewhat to the matters dealt with in other sections of this report.

The Committee recognizes that many of the 1998 recommendations are classified as implemented. However, the Committee is concerned that not all of the recommendations have been implemented and those that have, may not be effective. For these reasons it makes the following recommendation.

Recommendation 5

SRD place a high priority on implementing any outstanding recommendations of the KPMG report (Alberta Fire Review, 1998) and review the success of the recommendations implemented before the Chisholm fire incident, in light of and in the context of the Chisholm fire.

Submission of Chisholm Fire Review Committee Final Report to Minster

The Chisholm Fire Review Committee respectfully submits the findings and recommendations contained in this report to the Minister of Sustainable Development.

Dated at Edmonton, Alberta – October 2001

G. J. (Gerry) DeSorcy
Committee Chair

Jack D. Cohen
Committee Member

Lucille Partington
Committee Member

APPENDICES

Appendix A
Chisholm Fire Review Committee and Support Team Biographies

Committee Members

Gerry DeSorcy

Chairman, Chisholm Fire Review Committee
Regulatory Consultant, DeSorcy Consulting Services
Calgary, Alberta

Gerry is a regulatory consultant with 46 years experience at technical and administrative levels. He spent 38 years with the Alberta Energy and Utilities Board (EUB) and the Natural Resources Conservation Board (NRCB) and was extensively involved in policy development and application of policies regarding technical, conservation, business and environmental issues and sustainable development. He worked at many levels throughout the EUB organization dealing with all aspects of regulation, and was Chairman and Chief Executive Officer at the time of his retirement.

Since his retirement from the EUB and NRCB, Gerry has consulted on a variety of general, legal, policy and technical oil and gas and environment related regulatory issues for governments and private companies in Canada and elsewhere. In this capacity, he has provided advice on the development of a number of regulatory systems. He also developed and lectured in a credit course on oil and gas regulation at the University of Calgary.

Jack Cohen

Research Physical Scientist,
Fire Sciences Laboratory, USDA Forest Service
Rocky Mountain Research Station,
Missoula, Montana

Jack has been involved in fire management and fire research since 1972. He initially worked as a research assistant on prescribed burning research and as a seasonal firefighter. In 1976, he became a permanent scientist at the Missoula Fire Sciences Laboratory as a developer of the 1978 National Fire Danger Rating System. While at the Missoula Fire Lab, Jack also contributed to the development of the first hand-held Fire Danger/Fire Behaviour Calculator (TI-59) and contributed to the procedures used by fire behaviour analysts. In 1979, Jack transferred to the Riverside Fire Laboratory where he developed the FIRECAST interactive wildland fire behaviour information system. He conducted research on live fuel fire behaviour in chaparral and also served operationally as a prescribed fire lighting supervisor and fire behaviour analyst in southern California.

Presently, Jack's research involves understanding and modeling structure ignitions during wildland fires. Additionally, Jack has been involved in research to quantify the requirements for effective firefighter safety zones and fire shelters and was a member of the fire behaviour team that investigated the fire behaviour related to the firefighter fatalities during the 1994 South Canyon Fire. He is one of the principal scientists involved in the International Crown Fire Modeling

Experiment, NWT, Canada, where he is investigating the thermal characteristics of crown fires related to structure ignitions and fire spread.

Jack's education includes a Bachelor of Science in Forest Science (wildland fire) from the University of Montana, 1973. He has a MS degree in Bioclimatology from Colorado State University, 1976. He has additional university course work in meteorology and mechanical engineering.

Lucille Partington — Homeschool coordinator and chair, Sustainable Forest Network Centre of Excellence, University of Alberta
Sexsmith, Alberta

Lucille is an active and involved Albertan with over 20 years experience serving on various government and local boards. She is skilled in public consultation and review board techniques and procedures. Most significantly, Lucille co-chaired the Northern River Basin Study, a large federal-provincial environmental review that involved stakeholder consultation. She also served as a town councilor in Sexsmith for two terms. Having lived in Sexsmith since 1977, Lucille understands and appreciates the values and mindset of residents of small Alberta towns, villages and hamlets. Lucille's formal education includes a Bachelor of Education from the University of British Columbia and several courses from the U of A and Grande Prairie Regional College. Currently Lucille is the chair of the Sustainable Forest Management Network at the U of A as well as a home school coordinator for 20 families in the Peace River District.

Support Team

William (Bill) Bradshaw — Assistant Director, Strategic Planning Branch
Strategic Planning and Resource Assessment
Forest Service – USDA
Washington, DC

Bill has served in National Forest resource management programs, conducted research for wildland fire prevention, was the national coordinator for (emergency) incident business management, and now serves on the staff providing strategic direction and coordination under the Government Performance and Results Act. Bill's education includes a BS in Forestry (1964) and an MS in Forest Entomology (1965) from the University of Michigan. He also has an MA in Communication Research (1977) from the University of Washington and a PhD in Communication Research (1987) from the University of Michigan.

Ian Pengelly — Manager, Fire Vegetation Program
Banff National Park - Parks Canada
Banff, AB

Ian has been a Park Warden with the National Parks Branch since 1975. Since 1989, he has worked as the fire management program supervisor in Banff National Park. His duties include coordination of the fire suppression program, fuels management, planning and implementing prescribed fires, and serving on an incident command team for campaign fires. He has a B.Sc. in Geography from the University of Alberta.

Elvin Reimer

Wild fire Operations Manager
Saskatchewan Environment and Resource Management
Fire Management and Forest Protection Branch

Elvin has been involved in wild fire management for 22 years with the Government of Saskatchewan. Elvin's experience includes organizing initial attacks, fire boss and wildfire operations manager responsibilities. Currently, Elvin's role includes management of the provincial fire preparedness program, the large fire management program and the fire prevention and education program. As part of his current role, Elvin also conducts internal reviews/debriefs of all major fires within the province. He has been involved with several public review processes such as the Fire, Insect and Policy Review.

Frederick Alexander Day, Q.C.

Partner
Mclennan Ross
Edmonton, Alberta

With over 20 years of legal experience, Fred specializes in civil litigation and administrative tribunal work focusing on employment law, labour law, and Human Rights. Over the years Fred has been an active member of his community, serving on various legal and community boards.

Amy Santoro, ABC

LucidWorks Strategic Communications Planning
Communications Consultant
Edmonton, Alberta

Amy is an accredited business communicator (International Association of Business Communicators) with over 12 years of communications experience, mainly in the public sector. Amy specializes in strategic communications planning, issues management and government relations.

Mike Partington

High School Teacher
Spruce Grove, Alberta

Mike has been involved in public consultation and information gathering in both the corporate and public sector. Mike is a former chairperson of a municipal taxpayer's association and current chair for the Community Lottery Board.

Appendix B
Summary Of Public Outreach Process

The following is a summary of opinions and suggestions raised during the public outreach process conducted by the Chisholm Fire Review Committee during July and August 2001. This outreach process provided the Committee with important local input as it developed its final recommendations for the Minister. Comments selected to this summary were either voiced at two or more of the meetings or elicited strong support at a single meeting.

These comments are not intended to statistically reflect overall attitudes and opinions of the Chisholm fire, but rather to provide an overview of comments and suggestions expressed at these informal meetings. Comments reflect the views of outreach participants and not necessarily of the Committee.

While participants raised a wide range of issues and suggested solutions, four recurring themes emerged. The information gathered from Chisholm and area residents presented in this section is organized in accordance with these key themes. Included in this section are summaries of meetings with interested Albertans, industry, MD 124, the RCMP and SRD.

Overview - Chisholm and Area Residents

Communications

- Communication between individuals and the MD, individuals and SRD and communication between the MD and SRD were of particular concern.
- Homeowners did not understand their responsibility when choosing to live in a forested area and did not understand some of the personal efforts they could make to be "fire smart." Residents explained that if they had been more aware of the risks of wildfire and the policies with respect to the need for insurance, more might have been carrying it. There were many specific examples including a lack of knowledge about how fences, outbuildings and structures could and should be insured.
- SRD cutbacks and the closures of local offices such as the one at Smith were a serious problem since communication and the ability to get the to fire and make decisions more quickly would have affected outcomes. Local SRD personnel knew where local resources were and had frequent communication with local governments such as the MD and a clear knowledge of the physical area and the people.
- Some residents seemed confused about evacuation and their options and some reported being forced to leave their property. Evacuation communication was poor. Residents felt they could not get adequate information about what was happening even though there was fire camp in the local gravel pit for part of the time. There were a variety of conflicting stories about what would happen after they evacuated (some said they were told their homes would be safe, would have foam sprayed, would be watered by the helicopters, for example.)
- Following the fire, the residents of Chisholm reported hearing on radio or television that the community burned and some homes were lost – not by the MD or SRD. Residents said they left phone numbers upon evacuation so they could be informed of events.
- Land and cabin owners reported they were not contacted or warned of the fire by either the MD or the SRD (they suffered extensive losses from the fire). They believe they could have taken action if they had been notified. Communication with the department in Lac La Biche was adequate but when then they finally heard that the houses were destroyed they had to call the MD where the communication was better.
- Sunday night before Chisholm burnt, residents reported watching the smoke knowing it was bearing down on Chisholm; some drove in to see for themselves. RCMP claimed everything was fine and secured entrance to Chisholm again. Local residents were staying in the gravel pit with a firefighting crew. A perimeter had been secured around the hamlet, giving residents another false sense of hope.

Interagency Coordination

- Chisholm residents reported that the MD did not come to the community at any time with water or a fire truck. (In follow-up discussions in the group meetings, the department felt they had requested a truck but the MD felt they had not been asked.)
- The involvement of two fire districts caused problems getting the closest equipment to the fire immediately. The most available equipment should have been used instead of bringing it from Lac La Biche and Cold Lake. (The department explained that equipment has to be registered and the operators must meet certain requirements.)
- When there were rangers in Smith they knew the available resources and were quicker to use them. The management of resources from a distant office prevents the use of local resources.
- The effort was disorganized - some equipment never left the back of the trucks on which it was hauled. They could have brought in material from Smith, Athabasca, Fawcett or Flatbush and used their water equipment to take care of houses.

Initial Attack Efforts

- There was much concern over the effectiveness of the initial attack with some residents saying the implementation took too long and was seemingly unsuccessful. SRD should have been on the fire much sooner noting that when the ranger was around things happened quicker. It was suggested the fire was phoned in at 10:00 p.m. but crews did not arrive until 12:15 p.m. Questions were raised about why local resources were ignored and instead brought in from distant locations, which hindered response time.
- Some remember a southbound train at 9:30 p.m. and that the fire started on mile 100. There have been numerous fires in the same place over the years. They would like to see regular patrols at night and more initiative with available equipment. Also, there is a need to ensure local residents know what precautions to take.
- There was frustration over seeing vans of people and cats sitting idle all day when there was so much fire everywhere. At one point there were two vans full of fighters who were sitting for hours and not fighting the fire.
- The firefighting activities should have been run out of Slave Lake instead of Lac La Biche. The first cat out was told to sit at the corner and wait. Local residents were often the ones actually fighting small fires and help was not offered by passing vans. Residents said a passing water truck operator told them he needed to use foam to fight one small fire he was working on. It wasn't until another truck came by that they were able to convince the water truck to come back and help.

Community Protection Efforts

- There was a lack of protection provided considering the large amount of equipment based right in Chisholm. The camp was right there but the town was not saved. As soon as the fire threatened Smith and Hondo, the towns were filled with sprinkler systems and pumps. SRD had three full days to protect Chisholm but they did not.
- In 1998, there were pumps and water bombers. That fire went out, but this time SRD dug a fireguard that was only 14 feet wide and the fire jumped it. Residents said they were not supplied with water hoses, generators, fire retardants, to protect their homes. There was little equipment and/or crews were sitting on the side of the road. Yet the following day, after losing the Chisholm homes, Hondo and Smith had miles of hoses and generators protecting their homes. The Athabasca River is only a half-mile from the hamlet – something went wrong.
- SRD officials told residents during the last evacuation that protective measures would be taken to save their homes. The residents said that they felt their homes would be protected when they left.
- There was frustration with the fact that the priorities of the department are supposed to be people and structures but while Chisholm was destroyed, for three days people saw the bulk of water bombing and air resources expended on the west side of the river. If people were really the priority

- why was the immediate area around Chisholm not concentrated on more, they asked. Timber seemed to be valued more than people.
- Residents were told they could not assist with firefighting efforts because were not certified.
- Local resources were underutilized and rejected when offered. There was also general frustration that SRD took over from the MD and thus ignored the needs of MD residents and taxpayers.
- SRD had three days to protect the town. SRD knew the wind was going to change but they did nothing about it.
- Firefighting could happen at night and SRD should have looked after the back door of the fire especially knowing that the wind was going to shift. The Ontario fire crew, according to residents, said they were used to fighting at night while the Alberta ones said that they would only fight during the day.
- Frustration was expressed with the youth and relative inexperience of firefighters. The effort of some firefighters was questioned including an incident where one fighter was witnessed playing a video game while residents fought some fires.
- In the middle of the hamlet crews were seen sleeping or resting while the fire was close enough (in the perception of the resident) that they should have been actively fighting the fire.
- There was frustration that the road was not closed to the media before the residents were allowed back in.
- Too much effort was expended on setting up the camp while the town was eventually allowed to go unprotected.
- The aftermath is as frustrating as the event. Some residents are hurt by the fact that SRD is spending money on crews coming in and out of town for months afterward dealing with minor situations when the major situation never should have been allowed to ruin their homes in the first place.
- Some individuals were frustrated with the reclamation effort after the fire and their attempts to communicate their concerns. For example, some felt that guidelines should take into account that farmland needs to be left in a workable condition.
- Some felt they were promised financial help and then told there would be no help. Some felt frustrated with the process of trying to put their lives back together and not having the help or knowledge to do this. The MD or some level of government should help them with putting their lives back together.
- Some support for allowing some fires to burn more often to reduce the fuel amount and dead trees.

Positive comments also emerged from area residents:

- The efforts of the helicopters were excellent and the cat drivers were very brave. The firefighters did the best job they could do under the circumstances.
- The effort was good on behalf of the firefighters although it seemed that the left hand didn't know what the right hand was doing.
- Some felt the money spent by the department was justified and well spent but that the amount of money spent by the MD was wasted.
- Two people thought the crews were not sitting around as much as being ready for action. They also felt that the cat operators were very brave and that it was impossible to predict because the fire was actually coming back against the wind.

Overview – Interested Albertans

One individual expressed concern that initial attack times have slipped badly from the 1980s goal of 15 minutes after the point of ignition in conditions of extreme hazard. He said the department needs policy clarity regarding objectives, risks, boundaries and responsibilities for detection and initial attack.

He had concerns that the equipment used today is largely incapable of fighting structural fires even though it is increasingly needed for those incidents with greater development in the forested areas. He also believes that all users must share in the cost of fire control in the province. This would provide funding which the department could use on initial attack crews to prevent the big fires by attacking them at the earliest possible opportunity.

It was also recommended that industries need to step up patrols in times of high fire hazard; the Canadian system of sharing firefighters be used only as a last resort; young stands of trees which are economically important in the future should be protected; and a specialized investigation unit be formed to quickly determine causes of fires.

Another member of the broad public emphasized the need to learn from the terrible event and build and develop policy for the future. He said that if we do not take proactive measures immediately, these terrible spring fires are going to continue and will eventually result in the destruction of much larger communities like Slave Lake.

He pointed out that historically Aboriginal people in Canada looked after fire control by burning in the spring in areas of high danger. It is only in the last 100 years that the European view of fire management has been allowed to take over the psyche of forest managers. He suggested a need to move towards a system of prescribed burning in areas of concern to prevent the kinds of wildfires that we saw in Chisholm. We are overloading fuel loads in the boreal forest and we need to take steps to reduce the fuel through prescribed burns. We also need to standardize and monitor development in the forest ensuring that new communities, leases, and right of ways are developed in a manner that fits within standards for safe distances from fuel loads.

He also said we need to fireproof at risk communities by ensuring that there is at least a half mile belt between the forest and the community where none of the fuel load is present as well as fireguarding individual residences in the same way. Additionally, we need to burn non-commercial forests frequently to prevent disastrous wildfires, build an extensive system of fire breaks throughout the province, look at the role livestock can play in the management of forest through grazing of some grasses, encourage slash burning, and move toward increased professionalism amongst foresters, including more education on the biology and ecology of the forest ecosystem.

Overviews - SRD, MD 124, Industry and RCMP Meetings/Presentations

Meeting - SRD staff – July 26, 2001

The Committee met with SRD staff for a high-level overview of the Chisholm fire before the Committee traveled to Chisholm and Slave Lake to meet with area residents and local representatives. Through four presentations, SRD staff provided the Committee with an overview of the following:

- Roles and responsibilities of the Department of Sustainable Resource Development associated with forest fires, including jurisdiction, evacuation processes and FireSmart planning.
- Introduction to wildfire behaviour, fire danger rating system, fire weather index and a summary of historical weather patterns.
- Fire situation in Alberta, including maps showing fire starts up to five days before the Chisholm fire and fire suppression resources.
- Summary of Chisholm fire, including start, daily growth, fire suppression resources and weather at the time of the fire.

The Committee also heard from a representative of the Disaster Services Branch who spoke about the role of Municipal Affairs and the evacuation process.

Presentations – SRD, Fire Management Team – July 30, 2001

In commenting on the fire, the team indicated that the major complicating factors included wind shifts and a slow initial attack to respond to the many and diverse situations facing the team in this fire. They recommended evacuation and asked the RCMP for help but never forced the issue and did not give any guarantees to residents concerning the activities that would take place upon their evacuation. Members of the team said they did not feel that Chisholm was threatened to a great extent on the weekend and by the time it was, there was not a safe circumstance to do anything about it.

There was general agreement that the Rapid Fire group was not in place only for structures and there was confusion as to the team's abilities and responsibilities in relation to the wildland-urban factors present in this fire. The establishment of a person or team of specialists to deal with wildland-urban fires was discussed.

Local municipal resources, which were requested, were unavailable because Chisholm does not have a volunteer fire department and resources elsewhere were limited, especially with fires near other communities.

There was discussion regarding the expectations and realities of fire behaviour in Chisholm and whether or not there are alternative strategies for future events of this sort. The comments centered on the high awareness of personal safety and the position that if communities or structures are of concern, then resources must be reallocated and training is provided.

Some of the other issues discussed included moving to a more decentralized system of resource development and communication by the department.

Committee questions centered on the ground resources not used and processes to engage local knowledge and resources. The responses included the need to use registered, on call equipment and the fact that some equipment came without the requisite management resources from the department.

Presentations – Industry Representatives – July 31, 2001

Industry representatives indicated that their losses in the fire were considerable. As a result of the 1998 and recent Chisholm fires, Vanderwell's long-term wood supply has been reduced by approximately 100,000 m^3 of Annual Allowable Cut. In addition, the company suffered a loss of 5.2 million seedlings for a net value of $4.5 million. They lost 76 per cent of their FMA. The company believes that if they are not successful in obtaining secure replacement wood to offset the recent fire losses, once the salvage of the burnt wood is complete, there will be no other option but to consider reduction of full time positions.

In addition, the ripple effect will negatively impact harvesting, transportation, reforestation and road construction contractors, and local communities such as Slave Lake, Smith, Hondo, Chisholm and Flatbush will feel this impact.

Weyerhauser lost much less, about 4,800 ha, because the footprint of the 1968 fire slowed down the Chisholm fire. It is estimated the company lost 150,000 trees. 20,000 new hectares burned into the old burn.

West Fraser lost 1 million m^3 of deciduous and 1.5 million of coniferous, shared with Vanderwell. In addition to the seedlings, there was .5 million mid-growth trees. It lost 1 million seedlings spread out over 658 ha and 1,600 ha of slashburn regeneration areas. The long-term impact is 20,000 m^3 per year deciduous and 10,000 m^3 per year coniferous.

The industry group believes that SRD has improved fire readiness and overall firefighting since the review of the Mitsue fire. In 1998 the government was in the middle of downsizing and reorganizing, resulting in the loss of considerable fire management experience. As a consequence of the reorganization and the low fire incidence experienced two years before, SRD found itself less than prepared for the 1998 fire season, according to industry representatives.

This group indicated the strong liaison with industry in the Slave Lake area should be expanded into other regions because the program has enhanced communications within the services and fire programs associated with the industry. The liaison is a fast way for the forest industry to collect resources and help with the suppression efforts, especially as cat bosses. Industry can get experienced people on the scene quickly.

There was a view that SRD had sufficient resources and was ready for action but there was some question as to why it took so long to move into action in this case. Also, industry does not want to see SRD move further into white zone activities because the service is not sufficiently equipped to fully handle the green zone - there needs to be a major enhancements before this could happen.

The consolidation from 10 headquarters to five may have been too drastic; indeed the impact on local knowledge and resources has been dramatic. When there were local forest rangers with fire officers in more locales they responded better.

When questioned regarding industry support for fire break zones and controlled burns to manage the land so that these types of large fires don't have such a drastic impact, industry said this has to be left with the province because of priorities being life, communities and watersheds.

Industry supported the concept of a more formalized approach, like a command center accessible to the industry partners who could have immediate input and give advice to the fire bosses. They also said an overall plan for strategic problem solving ahead of time at the policy maker level is needed.

Meeting – MD 124 Representatives – July 31, 2001

The MD was apprised of the fire the morning after ignition. They were told that some residents might need to be evacuated around Flatbush. They decided to start using their emergency plan, including a command post and reception area as well as some standby volunteer firefighting. There was some conflicting information and the MD sent out an officer to open up lines of communication. The emergency response plan involvement of interested parties is the same as the Town of Slave Lake and it does not include SRD, although lines of communication are opened early and are not closed until necessary. There was no involvement of local hamlets in establishing the plan.

MD officials indicated some surprise that Chisholm had been evacuated on Friday night. Sunday evening the fire went up the railway and the MD evacuated Chisholm on the direction of SRD. The Sunday evacuation was lead by an MD official who moved the residents to the gravel pit and then evacuated them out of the area on Monday. There was some confusion as to which jurisdiction Chisholm fell under between the Slave Lake and Westlock RCMP. There were regular updates every three hours to the RCMP but they were not as involved until the evacuation of Smith.

The MD said they enlisted an SRD official to evacuate the town on Monday. The RCMP told them that there was no ability to force people out but the residents were strongly recommended to leave. The MD said it took forwarding numbers, to contact the people afterwards.

If there was a structural fire in Chisholm, one of the local fire departments would go to assist, but it was not clear who is responsible for structures in Chisholm in the event of a wildfire. The only place that SRD does not control is Slave Lake so the MD officials assume the MD covers everything else.

There is evidence that Flatbush VFD played a role in fighting fires around Flatbush and that certain groups told residents of Chisholm that they would have helped but were not asked. The MD said they offered two foam trucks to SRD and it was declined because there was a fear of injury. They would not allow their units to go into an area where they would not be protected. Apparently, SRD advised that the safety of personnel could not be guaranteed, so the MD would not go into Chisholm.

In commenting on changes that might be made in future, MD officials said an improved system of communication in extreme cases would be beneficial. The MD would like to see representation at a higher level in the events of this nature. There was a distinct lack of information and ability to get that information. The public information officers did not have the information needed and in fact were asking the municipality what was happening.

The MD said it declared a local state of emergency, in part, because they were getting old information or less than accurate information and were concerned that things were happening beyond what they were comfortable with. The amount of information being released was confusing and lead citizens to challenge it. Also, the media were overly reliant on the MD, long-range plans were not available and there was inadequate information regarding the likelihood of fire spread as well as fire suppression activities. Terminology was also a concern.

The MD is not willing to legislate where people can live for them to be reasonably protected from wildfires. The MD said it would like to have contacts with SRD at a more senior level in events of this nature. Also, there was a challenge dealing with two different forest services in the same MD. They also suggested that overhead teams should be meeting at night because morning meetings waste time that could be used for firefighting.

Meeting – SRD – August 2, 2001

Following its meetings in Chisholm and Slave Lake (July 27-31) with area residents, representatives of MD 124 and industry, the Committee met again with SRD staff to gather more specific information as a result of its findings during its public outreach process. This meeting focused on:

- Firefighting resources and policies;
- Protection of Chisholm; and
- Communications.

Some comments included:

- Ignition/fire is not normally expected at 2100. SRD recognizes the need for more of a fire hall model where the resources are in place for these types of circumstances.
- The BUI in the ranges of 130+, with even a little wind, would jump the fire in stages very dramatically.
- The fire documentation team thought the prediction system did predict what would happen including intermittent ground fires with a high fuel consumption and rate of spread. The evidence shows that the column was dense, large, and dark and was a heavy fuel driven event.
- The S1 weather station was 20 km away - the conditions at the fire center were probably a lot worse.
- The Committee wondered why this information did not influence staffing. SRD uses the system to staff in terms of levels and holding of resources.
- SRD knows where fires along railroads start and have tried to implement plans to combat this.
- SRD does an afternoon weather reading and then forecasts into the night. The forecaster expected normal recovery and light winds in Chisholm so he did not upgrade the fire. He assessed it according to the responding officer - it wasn't spreading too fast at 2300 to 2400. The responding officer didn't call during the night so there was shock from other SRD staff when the fire moved from 50 to 1500 ha.
- The first weather advisory was issued on the May 26 to give as much notice as possible that there would be extreme fire events.
- The advisory indicated it was for the next burning period as well as the direction of the wind.
- SRD indicated staff was feeling comfortable and relying on the forecasts.
- SRD staff expressed need for better maps of spread and anticipated spread.
- There were times when the officer/ incident commander was overwhelmed due to the number of phone calls. There was a request for assistance but it was declined because the province was on high alert. Fatigue was a concern and it would be wise to double shift the team. Possibly there needs to be an overnight line boss to supplement the efforts of the overhead team. SRD indicated it was manned up very heavy everywhere but overtaxed on May 28 when fire raced through the entire zone.
- This fire involved a high level of complexity and limited resources for wildland-urban issues. SRD is a suppression agency to prevent the fires from getting to the structures, not the protectors of those structures. With regard to Chisholm, it was not felt to be in jeopardy – the fire escape was a surprise.
- The constant state of reacting to issues did not make it possible to consider other opportunities to protect Chisholm.
- Rapid Fire was expected to barricade, foam and install sprinklers – SRD staff did not realize the crew was inexperienced.
- Good communication requires the participation of administrations and commitment from the municipalities. Some discussion about future communication/command centre models.
- Discussion about the specific role of Disaster Services and possible coordination of information and communication efforts with SRD to ensure residents are aware of disaster relief/compensation provisions.

Meeting – Local RCMP – August 23, 2001

- Communication issues were at the forefront of discussions with the RCMP including the need for a command post, and awareness of the fact that the Slave Lake Detachment is responsible for areas south of Chisholm only and Westlock is responsible for Flatbush and most areas directly north. They also noted social services and health officials need to be in the communication loop when a hamlet, town or city is threatened. Additionally, they commented on the lack of up-to-date, consistent information.
- The RCMP realized that they had no authority to physically remove people during evacuations and used words like "strongly encouraged" and "enticed" in describing their efforts in this regard. They said forced evacuations would be limited to places where children were involved or when members felt that the resident may have not been sufficiently able to look after their own welfare due to mental distress.
- There seemed to be an awareness regarding the powers available under the state of emergency but some confusion regarding if and when an order was issued.
- RCMP officials indicated that once an evacuation order is issued, key community figures should be included to ensure affected people know about designated safe places. This amounts to having a well-communicated emergency plan.

Appendix C
Glossary

This glossary attempts to define most of the terms used within this report. For more information, please see the *Glossary of Forest Management Terms,* Alberta Sustainable Resource Development, 1998 http://envweb.env.gov.ab.ca/env/forests/fpd/

Canadian Forest Fire Danger Rating System
Based on more than sixty years of research, the Canadian Forest Service, in cooperation with fire management agencies, developed the Canadian Forest Fire Danger Rating System. The system uses weather, fuel and topographic data to rate the potential for forest fire ignition and to predict forest fire behaviour. Fire management agencies integrate information from the Canadian Forest Fire Danger Rating System in their strategic and tactical decision making process.

Canadian Forest Fire Weather Index (FWI) System
A subsystem of the Canadian Forest Fire Danger Rating System. The components of the FWI System provide numerical ratings of relative fire potential in a standard fuel type (e.g., a mature pine stand) on level terrain, based solely on consecutive observations of four fire weather elements measured daily at noon (1200 local standard time or 1300 daylight saving time) at a suitable fire weather station. The elements are dry-bulb temperature, relative humidity, wind speed and precipitation. The system provides a uniform method of rating fire danger across Canada. The FWI System consists of six components. The first three are fuel moisture codes that follow daily changes in the moisture contents of three classes of forest fuel. Higher values represent lower moisture contents and hence greater flammability. The final three components are fire behaviour indices representing rate of spread, amount of available fuel, and fire intensity; their values increase as fire weather severity worsens. The six standard codes and indexes of the FWI System are:

Fine Fuel Moisture Code (FFMC) - A numerical rating of the moisture content of litter and other cured fine fuels. This code indicates the relative ease of ignition and flammability of fine fuel.
Duff Moisture Code (DMC) - A numerical rating of the average moisture content of loosely compacted organic layers of moderate depth. This code indicates fuel consumption in moderate duff layers and medium-sized woody material.
Drought Code (DC) - A numerical rating of the average moisture content of deep, compact, organic layers. This code indicates seasonal drought effects of forest fuels, and the amount of smoldering in deep duff layers and large logs.
Initial Spread Index (ISI) - A numerical rating of the expected rate of fire spread. It combines the effects of wind and FFMC on rate of spread, but excludes the influence of variable quantities of fuel.
Buildup Index (BUI) - A numerical rating of the total amount of fuel available for combustion that combines DMC and DC.
Fire Weather Index (FWI) - A numerical rating of fire intensity that combines ISI and BUI. It is suitable as a general index of fire danger throughout the forested areas of Canada.

Cat line
Fire line constructed with crawler tractors (bulldozers).

Control a Fire
To complete a control line around a fire, spot any fires from there, and any interior islands to be saved; burning out any unburned areas next to the fire side of the control lines; burning off any unwanted islands inside the control lines; and cooling down all hot spots that are immediate threats to the control line until the lines can be expected to hold under foreseeable conditions. Stages of control are:

> **Out-of-Control (OC)** - A wildfire not responding or only responding on a limited basis to suppression action such that perimeter spread is not contained.
> **Being Held (BH)** - Indicates that with currently committed resources, sufficient suppression action has been taken so that the fire is not likely to spread beyond existing or predetermined boundaries under prevailing and forecasted conditions. (Contained.)
> **Under Control (UC)** - A wildfire that has received sufficient suppression action to ensure no further spread.
> **Being Patrolled** - In a state of mop-up, being walked over and checked.
> **Out** - Extinguished.

Control Line
All constructed or natural fire barriers and treated fire edge used to control a fire.

Crown fire
A fire that advances through the canopy of a forest (A layer of foliage in a forest stand. This most often refers to the uppermost layer of foliage). In other words, an intense wildfire that has taken hold of the treetops and can spread very quickly with the wind. Crown fires can be classified according to the degree of dependence on the surface/ground fire phase:

> **Intermittent Crown Fire** - A fire in which trees intermittently torch, but rate of spread is controlled by the surface/ground fire phase.
> **Active Crown Fire** - A fire that advances with flame extending from the ground surface to above the canopy.
> **Independent Crown Fire** - A fire that advances in the canopy only.

Deciduous
Trees belonging to the botanical group Angiospermae with broad leaves that are shed annually. Examples include trembling aspen, balsam poplar and white birch. Also known as hardwood.

Detection
The act or system of discovering and locating fires.

Dozer
Any tracked vehicle with a front-mounted blade used for exposing mineral soil.

Dozer Line
Fire line constructed by the front blade of a dozer.

Drought
A long period of substantially less than normal precipitation, occurring usually over a wide area.

Entrapment
A situation where personnel are unexpectedly caught in a fire behaviour-related, life-threatening position where planned escape routes or safety zones are absent, inadequate or compromised. These situations may or may not result in injury and include "near misses."

Extreme Fire Behaviour
A level of fire behaviour that sometimes precludes any fire suppression action. It usually involves one or more of the following characteristics: high rate of spread and frontal fire intensity, crowning, prolific spotting, presence of large fire whirls, and a well-established convection column. Fires exhibiting such phenomena often behave in an erratic, sometimes dangerous manner.

Fine Fuels
Fuels that readily ignite and are consumed rapidly by fire (cured grass, fallen leaves, needles, small twigs). Dead fine fuels also dry very quickly.

Fire Behaviour
The manner in which fuel ignites, flame develops and fire spreads and exhibits other related phenomena as determined by the interaction of fuels, weather and topography. Some common terms used to describe fire behaviour include:

Smouldering - A fire burning without flame and barely spreading.
Creeping - A fire spreading slowly over the ground, generally with a low flame.
Running - A fire rapidly spreading and with a well-defined head.
Torch/Torching - A single tree or a small clump of trees is said to "torch" when its foliage ignites and flares up, usually from bottom to top.
Candling - A single tree ignites and flares up.
Spotting - A fire producing firebrands carried by the surface wind, a fire whirl, and/or convection column that fall beyond the main fire perimeter and result in spot fires.
Crowning - A fire ascending into the crowns of trees and spreading from crown to crown.

Fire Break
A natural or constructed barrier used to stop or check fires that may occur or to provide a control line from which to work. Sometimes called a fire line.

Fireguard
A manually or mechanically built barrier intended to stop a fire or retard its rate of spread and from which suppression action is carried out to control a fire; the constructed portion of a control line.

Fire Line
Fire break built around a fire either with use of tractor-plow machinery or with hand tools. Fire lines may also be roads, plowed fields, streams and wet, swampy areas that will resist fire. If fire lines are successful in stopping a fire's progress it is commonly said "the lines held."

Flanks
The parts of a fire's perimeter that are roughly parallel to the main direction of spread. The left flank is the left side as viewed from the base of the fire, looking toward the head.

Fuels
Dry grasses, leaves, twigs, needles, shrubs or trees easily consumed by fire. More fuels cause a fire to burn more intensely (not faster). The rate of spread is controlled by the dryness of the fuels (primarily fine fuels), fuel type and degree of curing (in the case of grass or deciduous growth), and the wind speed.

Fuel Break
An existing barrier or change in fuel type (to one that is less flammable than that surrounding it), or a wide strip of land on which the native vegetation has been modified or cleared, that act as a buffer to fire spread so that fires burning into them can be more readily controlled. Often selected or constructed to protect a high value area from fire.

Ground Fire (or Surface Fire)
Burning organic soil that sometimes burns several inches to several feet under ground. Ground fires are often difficult to detect and can burn for an extended time. Fire burning on the ground and not reaching into the canopy.

Head/Frontal Fire
The portion of a forest fire spreading the fastest. Unless lives or property are threatened, firefighter's primary concern is stopping the head fire. The head can change direction depending on wind, making it particularly dangerous to work on directly. A forest fire can have more than one head.

Home Ignition Zone
Wildland-urban ignition research indicates that a home's characteristics and the area immediately surrounding a home within 30 to 60 metres (100 to 200 feet) principally determine a home's ignition potential during a severe wildland fire. This area that includes a home and its immediate surroundings is the home ignition zone.

Initial Attack
Fire control work by first firefighters arriving at a fire.

Litter
The top layer of the forest floor composed of loose debris of dead sticks, branches, twigs and recently fallen leaves or needles. Decomposition has altered the forest floor very little.

Mop-up
The act of making a fire safe after it is controlled by extinguishing or removing burning material along or near the control line.

Prescribed Burn/Fire
Controlled application of fire to wildland fuels in either their natural or modified state under specified environmental conditions which allow the fire to be confined to a predetermined area and at the same time to produce the intensity of heat and rate of spread required to attain planned resource management objectives. Any fire deliberately used for prescribed burning; usually set by qualified fire management personnel according to a predetermined burning prescription.

Presuppression
The movement and placement of firefighting resources around the forest before and in anticipation of wildfire outbreak.

Rate of Spread
The horizontal expansion of the fire perimeter primarily at the head of the fire, but also including the spread from the flanks and rear of the fire.

Skidder
A wheeled or tracked vehicle used for sliding and dragging logs from the stump to a landing.

Skidder Unit
A self-contained unit consisting of a water tank, fire pump, and hose specially designed to be carried on a logging skidder for use in fire suppression.

Suppression
The control and limitation of a wildfire's progress once it has started.

Tightlining
Following the edge of the fire when building a dozer line to minimize unburned fuel between the fire and the dozer line. The alternative dozer line tactics are parallel attack (building a shorter, straighter fire line a short distance from the fires edge) and indirect attack (building dozer line at some distance from the fires edge, often to take advantage of certain fuel types or natural barriers to fire spread).

Unified Command
A command structure that allows all responsible agencies or individuals to jointly manage an incident through a common set of objectives.

Values at Risk
Community assets such as people, places and natural resources that may be lost during a wildfire.

Wildfire
A destructive or uncontrollable fire that spreads with great speed and involves flammable vegetation such as trees, bushes and grasses.

Wildland
Undeveloped land in its natural state, often vegetated with trees, bushes and grasses.

Wildland-Urban (Interface)
The line, area or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.

Appendix D
Resources

The following sources were reviewed in the completion of this report:

Alberta Fire Review Report, 1998 – KPMG, 1999

Alberta Fire Review Implementation Summary, SRD, June 1, 2000

Alberta Forest Protection Policy Manual, April 2001

Alberta Sustainable Resource Development Website Forest Protection section
http://envweb.env.gov.ab.ca/env/forests/fpd/flash.html

Chisholm Fire Complex – Events Chronology, August 1, 2001

Communicating Wildfire Information, Alberta Sustainable Resource Development, February 2001

Disaster Services Act

Documentation Report Chisholm Fire, Chisholm Fire Documentation Team – Drafts June 2001, July 31, 2001, September 2001

Fire Sciences Laboratory Website, USDA Forest Service - Missoula, Montana
www.firelab.org

FireSmart – Protecting your Community from Wildfire, 1999

Forest and Prairie Protection Act

Glossary of Forest Management Terms, Alberta Land and Forest Services, 1998
http://envweb.env.gov.ab.ca/env/forests/fpd/

Introduction to Fire Behaviour, Alberta Environment Environmental Training Centre

Municipal Government Act

Natural Resources Canada - Canadian Forest Service Website
http://www.nrcan.gc.ca/cfs-scf/science

Partners in Protection Planner

Pilot's Handbook (SRD)

Presuppression and Preparedness System (SRD), February 2001

Wildfire Management – Alberta Sustainable Resource Development, 2001