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Integrated Resource Management in Alberta's Boreal Forest: Opportunities and Constraints

by

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INTRODUCTION

Growing alarm regarding the cumulative impacts of rapid resource development in the boreal forest region of Alberta has encouraged scrutiny of the policy and management regimes associated with resource development activities. In particular, the tendency for the provincial government of Alberta to allocate multiple resources to a range of users on the same land base, while at the same time regulating these uses separately, may exacerbate cumulative impacts, and contribute to conflicts among resource users. Presently, the boreal forest is undergoing industrial development from agriculture, coal and peat mining, oil and gas activity, timber operations and human settlements (Strong and Leggat, 1992; Natural Resources Service, 1998). Starting in the 1940s, conventional oil and gas activity has profoundly impacted this region through the creation of well-sites, seismic lines, and pipelines (MacCrimmon and Marr-Laing, 2000). These developments, along with cut-blocks and access roads from timber operations, have fragmented the forest. As well, agricultural and human settlements have caused permanent removals of forest. Consequently, the ecological integrity of the boreal forest region is seriously compromised, and conflicts over land and resource uses are increasing.

Integrated resource management (IRM) is a relatively new concept in landscape management that has been proposed as a solution to multiple use conflicts, by providing a coordinated management plan for multiple resource extraction in the boreal forest (Koning, 2001). Though various definitions of IRM exist, in general it involves the coordination of two or more industries operating on the same land base, with the goal of reducing the overall impact of industrial activity and incorporating a range of ecological, social and economic values (Mitchell, 1986). The government of Alberta has supported the concept of IRM through various mission statements aimed at promoting sustainable development. Such initiatives, however, have not yet been applied to any significant extent, largely due to the limited understanding of how to effectively implement IRM in Alberta's boreal forest.

This report contains the initial findings of research currently in progress on the opportunities and constraints associated with implementation of IRM in the boreal region of Alberta. In Section I, we review Alberta's current natural resource policy regime, with particular focus on the regulation of planning and development in the timber and conventional oil and natural gas industries. Because oil sands development is characterized by a distinct set of regulatory mandates and inter-industry relations, we will not be addressing oil sands

development in the current paper. The information in this report was compiled from numerous government documents and reports, as well as several information sessions with representatives of these industries and their regulatory bodies. We then turn to existing relations among oil and gas and forestry companies, highlighting the degree to which the nature of the resource and current policy may lead to conflicts among users, discussed in Section II. In Section III, we will discuss a handful of current IRM projects that a number of government and industry actors have undertaken in recent years. In the final Section (IV), we will draw initial conclusions regarding the potential for broader implementation of IRM in northern Alberta, and outline future research steps for this project.

I. ALBERTA'S NATURAL RESOURCE POLICY REGIME

The vast majority of resources in northern Alberta, including land, trees, minerals, animals and water, are owned by the Crown of Alberta. The provincial government has the right to make laws in relation to the development and conservation of its natural resources. A variety of statutes and regulations enable the relevant Ministers to dispose of the Crown's interests in land and resources. Crown land can be conceptualized as a bundle of natural resource rights, which are parceled out in a piecemeal fashion to individual users. For example, the rights to cut timber can be allocated to a forest company, while the rights to develop an oil pool beneath the surface can be allocated to an oil company. The rights to hunt on that same land base can be allocated to yet another set of users. Statutes and regulations governing the disposal of natural resource rights are resource-specific, and thus involve distinct processes for each resource. As a result, there are considerable differences in the policy regimes of different resource sectors, particularly between those pertaining to the oil and gas and forest sectors.

Alberta's Forestry Policy Regime

Forestry in Alberta

The first Forest Management Agreement (FMA) in Alberta dates back to 1954, with North Western Pulp and Power Ltd. in Hinton (Pratt and Urquhart, 1994). Forestry did not gain momentum in Alberta until the mid-1980s, following efforts by the provincial government to diversify Alberta's energy-dependent economy following a devastating crash in oil prices. The provincial government encouraged international investors to establish pulp operations in Alberta

by ensuring large allocations of timber and providing generous loans for infrastructure. In response, over six FMAs and accompanying pulp mills were negotiated between 1986 and 1993, encompassing an area equal to that of Great Britain (Pratt and Urquhart, 1994: 5-6).

The rapid development of the pulp industry in northern Alberta has had a dramatic impact on the provincial economy as well as the forest itself. Between 1984 and 1995, allocation of the provincial Annual Allowable Cut increased from 30 to 85 percent (Alberta Environmental Protection, 1996a). By 1992, the forest industry's revenue growth exceeded that of most other natural resource industries (Canadian Forest Service and Alberta Environmental Protection, 1994). Employment in the forest sector in Alberta has likewise increased significantly, with direct jobs in 1999 totalling 24,300, compared to 10,000 in 1989 (Canadian Forest Service, 1990: 15; Canadian Forest Service, 2000: 27). The forest industry nonetheless plays a rather modest role in Alberta's economy in comparison to the oil and gas industry. In 1999, the energy industry, including natural gas, crude oil, coal, sulphur and liquefied petroleum gases, comprised 20 percent of the province's 115.4 billion dollar GDP, while forestry comprised approximately 2 percent (Haynes, 2001). In the same year, natural gas accounted for 9.71 billion dollars of Alberta's major product exports and crude petroleum accounted for 7.73 billion dollars, for a total of 17.44 billion dollars. In comparison, forest products accounted for only 3.02 billion dollars of Alberta's major product exports (Economic Development, 2000:5).

Allocation of Tenure

The Crown disposes of Alberta's timber resources to operators by charging a stumpage fee for the trees harvested. In exchange, timber operators are allocated the rights to timber according to one of several possible timber disposition arrangements. Timber dispositions can be organized into two categories: area-based and volume-based. Forest Management Agreements (FMAs) are area-based dispositions, allocating the right to harvest and grow timber within a defined geographic area, as defined by a management plan that ensures sustained yield. These agreements grant a 20-year lease to the timber operator, with the option to renew at the end of this term. There are currently 21 FMAs in Alberta (Schneider, 2001). As of 1996, FMAs accounted for 48 per cent of Alberta's allocated timber (Alberta Environmental Protection, 1996b).

Volume-based dispositions include timber quotas or volume licenses and timber permits. The Timber Quota system was introduced in Alberta in 1966, giving quota holders the right to harvest a certain volume of timber from a specified location for renewable periods of 20 years. Timber Permits, on the other hand, are short-term agreements, usually under five years, that allocate a much smaller volume of timber than a quota, and are allocated to small operators or communities (Ross, 1995). Prior to the 1980s, volume-based permits were the predominant form of timber lease in Alberta and accounted for only a small portion of the province's forest reserves. With the rapid expansion of the pulp industry, however, volume-based timber allocations have declined in proportion to allocations to FMAs in Alberta. By 1996, after most existing FMAs had been established, quotas accounted for only 32 per cent of Alberta's allocated timber (Alberta Environmental Protection, 1996b).

Timber dispositions can also specify the type of timber to be extracted, allowing an operator to harvest either deciduous or coniferous species or both. Thus, in a single area, several dispositions can exist for timber alone. A timber quota holder, for example, may harvest the deciduous species in an area where an FMA holder has the rights to the coniferous species.

The maximum volume of timber that can be harvested is determined by the Annual Allowable Cut (AAC) for both volume-based and area-based dispositions. Operators can be penalized if harvest varies by more than ten per cent of the AAC (Ross, 1995:147). The AAC is established by the provincial government and can fluctuate depending on other allocations to forest tenure holders as well as changes in timber demand (e.g. a new production facility) (Alberta Environmental Protection, 1996a).

Operations and Land Management Responsibilities

Timber operations require considerable planning and infrastructure. Harvest planning for sustained yield typically entails timber growth projection cycles of anywhere from 20 to 240 years in length (Alberta Environmental Protection, 1996a). Road networks are established and regularly maintained for the transport of timber and machinery. As well, production facilities required for processing the timber, such as pulp mills and sawmills, are technology- and capital-intensive, requiring significant financial commitments.

The management responsibilities assigned to timber operators vary according to the type of timber disposition. In exchange for the rights to the timber, an FMA holder is responsible for

several aspects of land management for the entire FMA, including reforestation and environmental protection (Ross, 1995). Companies develop annual operating plans that describe harvesting methods and proposed developments such as roads, as well as provide a strategic management plan describing management objectives and proposed developments for the lifetime of the FMA. An FMA holder has the responsibility to develop all necessary wood-processing facilities, such as pulp mills. In addition, yearly fees for land rental and fire protection are charged to FMA holders. The government historically has provided grants and loans to timber operators for certain management obligations, as a means of encouraging industrial forest development (ibid.).

Compared to FMA holders, quota holders have few forest management responsibilities. They are required to prepare annual operating plans associated with timber harvest, but the province assumes responsibility for overall land management (Ross, 1995). Volume-based licenses generally do not require the construction of a production facility; rather an existing production facility must be identified that will be supplied by the licensee's timber (ibid.). Recently several facilities have been built as a result of new quota allocations.

Overall, the extent to which the current allocation of land management responsibilities incorporates all ecological and social values of the forest is questionable. FMA holders and the provincial forest managers are the only actors with mandated responsibility for land management, but the primary philosophy directing land management by these actors is sustained yield, whereby the land base is managed for the maximum perpetual extraction of timber (Lukert, 1996). This philosophy is meant to ensure a continuous supply of timber, but does not consider other forest values such as wildlife, water resources, biological diversity, or recreation. Other forest values are *recognized* in forest management, as FMA holders are asked to mitigate impacts of their activities on these values, but the extent to which forest operators manage *for* these values remains quite variable (Land and Forest Service, 1998).

Regulation of Oil and Gas Development

Oil and Gas in Alberta

Alberta lies in the Western Canadian Sedimentary Basin, and its borders encompass numerous oil and gas fields, as well as oil sands deposits. Alberta's boreal forest contains 80 named oil fields and 306 natural gas fields (MacCrimmon and Marr-Laing, 2000:14), and four oil sands

deposits: the Athabasca, Cold Lake, Buffalo Head Hills and Peace River deposits (Petroleum Communication Foundation, 1999).

There are several different types of reserves that may be cited when talking about oil and gas resources, such as proved reserves, probable reserves, or established reserves. Provincial governments will most often cite *established reserves*, which include that portion considered recoverable using current technology, and under present and anticipated economic conditions. Established reserves for natural gas—an estimated 1284 billion m³ (Government of Alberta, 1998)—include *proved reserves* which are currently available for production, and approximately 50 per cent of *probable reserves*, which are reserves believed to exist in sufficient amounts to be economically recoverable (Petroleum Communication Foundation, 1999:57). Established reserves for oil total 326.8 million m³ (Government of Alberta, 1998). Alberta's oil sands are estimated to contain 300 billion barrels of potentially recoverable deposits based on current technology, an amount comparable to the proven reserves of Saudi Arabia (Canadian Association of Petroleum Producers, 2001).

Considering the extraordinary volume of proved reserves in Alberta, the petroleum industry has been and promises to continue to be a vital player in Alberta's economy. In 1999, Alberta's petroleum industry accounted for 20 per cent of the provincial Gross Domestic Product (Economic Development, 2000), and directly or indirectly employed 165,000 people in 1998 (Petroleum Communication Foundation, 1999). In the same year, petroleum products, including crude oil, natural gas, sulphur and other petroleum products, made up just over half of Alberta's total exports, with a value of \$15.8 billion (Petroleum Communication Foundation, 1999). Revenue from the oil and gas industries in the 1999-2000 fiscal year was \$3.3 billion greater than expected due to high energy prices, enabling the government to eliminate net debt and make a substantial payment on accumulated debt at a rate much faster than expected (Government of Alberta, 2000:9).

Allocation of Tenure

In general, mineral rights agreements are transferable, exclusive, and relatively secure, but are of short duration, which, according to some scholars, gives the provincial government the ability to shape policy to public attitudes (Patriquin et al., 1998). The primary tenure allocations in the oil and gas industries include dispositions of subsurface mineral rights, and of surface rights.

Subsurface Rights: Subsurface mineral rights are granted in the form of either a lease or a license under the *Mines and Mineral Act* in Alberta. When companies submit a request for the disposition of oil or natural gas rights, the interdepartmental Crown Mineral Disposition Review Committee reviews the request, and determines whether to accept the request as submitted, attach conditions to the sale of the rights, or deny the request. This review process generally takes eight weeks before the actual posting of the sale. Notice of the sale of the subsurface mineral rights then remains posted for another eight weeks in advance of the sale date (Ponde, 2001). Sales are held every second Wednesday in Calgary, Alberta. Sealed bids are dropped off at the Calgary Information Centre of the Department of Energy before noon, and the results are announced the next morning (ibid.). In the northern region of Alberta, the initial term for mineral rights to natural gas and petroleum is four or five years, and can be renewed as long as the company can show that the area is still productive (ibid.).

A similar process of competitive bidding takes place for oil sands, but the agreements for the mineral rights to oil sands differ from those for conventional oil or natural gas. As of 1991, successful bids for relatively unexplored areas are granted a permit for five years, which can then be converted into a 15-year lease. For heavily explored areas, a ten-year lease may be granted (Patriquin et al., 1998:21).

Surface Rights: The *Public Lands Act* governs the granting of leases for surface mineral extraction. Companies must obtain a Mineral Surface Lease (MSL) from the Minister of Sustainable Resource Development and, in some cases, a License of Occupation (LOC) to gain access to the land on which they wish to develop resources. The application must be approved by the Land Administration Division of the Land and Forest Service in the department of Sustainable Resource Development. This division is responsible for reviewing a company's assessment of the potential impacts of the proposed development on the land base. The Land Administration Division takes an average of thirteen days to review an application for the development of a proposed well site, road or pipeline (Graham, 2001).

If the land is already part of a Forest Management Agreement, the operator must obtain written consent from the FMA holder. If landowners and occupants do not give consent, the mineral company may still gain access by seeking a Right of Entry order from the Surface Rights

Board. The Surface Lease or Right of Entry order for a site remains in effect until a certificate of reclamation is obtained from the Land and Forest Service. Until the reclamation certificate is issued, the company is responsible for the site and must continue to pay annual fees to the landowner or occupant (Griffiths and Marr-Laing, 2001:43).

Operations and Land Management Responsibilities

The development of mineral resources involves several phases: exploration; acquisition of subsurface mineral rights (discussed in the previous section); development and production; and abandonment and reclamation. Each phase is regulated under a complex set of statutes and regulations.

Exploration: Upon notice from the Department of Energy that the mineral rights for a given area will be sold, several companies may conduct seismic exploration of the land base. No license, permit or approval is needed for exploration that does not involve surface disturbance. For exploration involving surface disturbance, a company must obtain an exploration license and approval of their exploration program from the Land and Forest Service. In this process, companies must obtain permission for entry from the landowners--individuals whose names appear on the certificates of title to the land--as well as make a reasonable attempt to notify occupants--individuals other than the owner who have certain rights to the land. Companies must submit an Environmental Field Report with their application for an exploration permit, which ensures mitigation of environmental impact during all phases of the disposition. Companies must also file a Final Plan of Exploration with the Land and Forest Service upon completion of the exploration program, detailing the program that was carried out.

Development and Production: After surface rights have been acquired, the operator must apply to the Alberta Energy and Utilities Board (EUB) for all necessary drilling licenses. The EUB will approve, modify or reject applications, and can dictate the location of access road and conditions of construction. Applications for most production facilities and pipelines are also made to the EUB. Proposals for inter-provincial pipelines are handled by the National Energy Board. Low-pressure gas pipelines, on the other hand, are regulated by Alberta Infrastructure and Transportation. Applications must identify sensitive areas, document efforts to notify

landowners, occupants, and other sectors of the public, and address any outstanding concerns. Applications for pipelines require the consent of FMA holders, as well as appropriate authorities for any road crossings. Companies are required to develop the resource within the time of their lease or they will lose the rights to that resource. However, upon drilling, there is no obligation to produce if the company does not find it economically feasible.

Reclamation: Reclamation of the land after oil and gas development is regulated by the *Environmental Protection and Enhancement Act*, which defines reclamation as a process “to return the specified land to an equivalent land capability.” A surface lease cannot be surrendered and a right of entry order cannot be terminated until a certificate of reclamation has been issued by Alberta Environment. Until this time, the company must continue to pay annual fees to the landowner or occupant. The company maintains responsibility for any contamination, and is responsible for ensuring acceptable conservation and reclamation for five years after the certificate is issued. On the other hand, if a company goes out of business, its wells become “orphaned,” in which case the EUB pays for reclamation from the Orphan Fund, which is financed by a levy on industry (Griffiths and Marr-Laing, 2001:45).

II. INDUSTRY RELATIONS AMONG FOREST AND OIL/GAS OPERATORS

Thus far we have been discussing the policy regimes of forestry and oil/gas development separately. In this section we will begin to look more closely at current relations among forest and oil/gas industry operators, and the conflicts that have emerged among these industries during development activities. This section is broken down into two components: an overview of some fundamental differences between these two industries, and how these differences can lead to multiple use conflicts on the ground. These conflicts have led to a growing interest in IRM, and the following section will identify several recent IRM initiatives, led by both industry and government.

Basic Differences Between the Oil and Gas and Forest Industries

Many of the fundamental distinctions between the forest and oil and gas industries are associated with the nature of the resource itself. Because mineral resources are non-renewable while timber is managed as a renewable resource, planning and development for these activities proceed along

distinct and often incompatible avenues. The time- frame for development and land area allocations are two of the most notable differences between these industries. The planning horizon for forest industry operators can be between 50 and 100 years and FMA holders are allocated rights to extremely large land bases. The oil and gas industries, by contrast, have a much shorter time horizon: the life-span of a typical well-site can be as short as ten years. Furthermore, with the notable exception of oil sands projects, rights can be allocated on a piecemeal basis for very small parcels of land, such as well-sites. This situation translates into the existence of numerous oil and gas operators, whose production activities fluctuate widely on the basis of current prices for these fuels.

Based largely on the distinctive planning features of these industries, the standards and requirements for resource management for the forest industry are significantly more complex than for oil and gas. Industrial forest actors, particularly FMA holders, are responsible for ensuring the sustained yield of timber supply and all the management components this entails, throughout all phases of planning and development. Furthermore, management responsibilities for the forest industry are for an extensive land base and time horizon compared to most oil and gas companies. This distinctive distribution of land management responsibility, combined with the notable difference in planning and development time horizons between forestry and oil and gas, seriously constrain efforts at multiple use planning.

Difference in Policy Regimes

Responsibility for Forest Management: Both the forestry and oil and gas industries have a considerable impact on the boreal forest, with each industry removing nearly equivalent volumes of timber each year. All industrial operators are required to mitigate the impact of their developments on the land base; however, as mentioned above, there is a significant difference in forest management responsibilities between the two sectors on a spatial scale. Moreover, there is no formal forest management mechanism applying to all oil and gas and timber companies that accounts for their combined impacts.

As a requirement of its tenure over the resource, FMA holders must outline how the impacts of timber extraction will be mitigated and environmental protection ensured in a comprehensive management plan. Called a Detailed Forest Management Plan, this plan is prepared soon after the FMA is approved by Cabinet (Land and Forest Service, 1998). It applies to the entire FMA

and must establish a schedule of development goals for every five to ten year period of the tenure agreement. In addition to following provincially-mandated forest management practices, forest companies are encouraged to consider alternative strategies, such as retention logging or logging that mimics natural disturbance, as a means of maintaining forest health. These strategies can be frustrated by oil and gas activities occurring in the same area. Because oil and gas operators are not required to accommodate the forest planning efforts of the FMA holder, areas designated by the FMA holder for retention can be subject to oil and gas development. When this timber is removed for oil and gas developments, the value of these mitigation efforts is lost.

Forest management responsibilities for the oil and gas sector, on the other hand, include assessing and mitigating the environmental impacts of development. Their obligations are site-specific: assessment and mitigation occurs with each application for exploration and development, and usually applies to a localized area, such as a well-site. Reclamation of developed land is part of the mitigation process and is also site-specific, as a certain area is reclaimed after extraction has ceased. Because assessment and mitigation occurs on a site-specific basis, these measures do not account for the cumulative impacts to the land base caused by multiple oil and gas developments. This distinction in the scale of mitigation planning represents one of the most significant differences in the regulatory regimes of forest and oil and gas industries.

Time Frame for Approval: As mentioned above, the oil and gas and forest sectors work on different time frames, from the planning phase to actual development. This difference in time frames is extended to the regulatory procedures that characterise these industries. The time between acquisition of subsurface mineral rights, to the extraction of the resource, is often only three months (Fantin, 2001). The same process for industrial forest operators can take several years and involves the required forest management planning, regulatory review, and infrastructure development. For oil and gas companies, approval is sought for each phase of each development, with no long term planning required. Each phase of oil and gas development approval takes anywhere from three weeks to a few months, after the appropriate site assessments and proposed mitigation measures have been submitted to the provincial government. Operation leases for conventional oil and gas developments can be for as little as five years. By contrast, leases to FMA holders are accorded on a 20-year, renewable basis. These

industrial forestry operators must have plans for development approved by the provincial government up to ten years prior to extraction (Land and Forest Service, 1998).

Self-monitoring: The EUB and Land and Forest Service have formal responsibility for monitoring the activities of the forest and oil and gas industries. Both of these bodies have been adjusting to rather large cutbacks in resources and staffing in recent years. EUB staff are required to inspect oil and gas facilities; however, the current number of staff responsible for monitoring oil and gas developments does not allow for regular inspection (Griffiths and Marr-Laing, 2001). Cutbacks have also occurred among Land and Forest Service staff who are responsible for monitoring soil and water quality around oil and gas developments as well as approving reclaimed sites, resulting in limited monitoring and enforcement.

These cutbacks in staff have translated into an increased reliance on self-monitoring for both the oil and gas and timber industries. As the onus is on the forest industry to manage the timber on its FMA in an environmentally responsible manner and with consideration to other resource uses, the reliance on self-monitoring has resulted in FMA holders inadvertently absorbing the additional responsibility for monitoring the impacts of oil and gas activity on its land base.

Public Involvement

Mandated Public Involvement: Both the oil and gas and forest sectors are required to consult the public before they begin their operations. However, the forestry industry must continue to involve the public during throughout the lifetime of its tenure agreement, while the oil and gas industries have few responsibilities for public participation once extraction has commenced.

An FMA holder must employ some form of public participation while it is preparing its Detailed Forest Management Plan (Land and Forest Service, 1998). Recently, the provincial government has extended its public involvement mandate to all future FMAs, requiring the FMA holder to establish a local advisory committee to assist in forest management (Alberta Environment, 1996). Several recently negotiated FMAs, such as High-Level Forest Products Limited, now have local advisory committees. Although these opportunities present an avenue for public concerns to influence forest management, no mandate exists describing the extent to which the public should influence company practices.

The oil and gas sector is not encouraged to set up advisory committees, as is the forest industry, but instead is required to notify the public of development plans and address any concerns raised (Alberta Energy and Utilities Board, 1999:2). For the establishment of sour and sweet gas wells and test flaring, for example, companies must contact residents to inform them of the project, as well as reconcile any differences (Ulch, 2001). The only subsequent access the public has to oil and gas operations is through an EUB appeal process, whereby the oil and gas operator in question is required to negotiate with appellants during a formal hearing.

For both sectors, the quality of public involvement is at the discretion of the company undertaking development. The government does not provide clear guidelines for public involvement and leaves considerable responsibility with industry to consult with the public before development. As a result, the extent and effectiveness of public participation varies widely in both sectors.

Public Scrutiny: The forest industry in Alberta has been the target of much public criticism over the past two decades. Environmental non-governmental organizations (ENGOS), such as the Alberta Wildlife Association, Canadian Parks and Wilderness Society, World Wildlife Fund, and the Federation of Alberta Naturalists have long been active in lobbying all levels of government for improved forest practices (MacCrimmon and Marr-Laing, 2000). In the late 1980s, many local and provincial ENGOS, First Nations and other grassroots organizations collaborated to protest the construction of pulp mills and forestry operations in northern Alberta (Pratt and Urquhart, 1994).

While the oil and gas industry has not historically received the same level of scrutiny, this is quickly changing with the increasing number of conflicts between landowners and industry over the development of sour gas wells and other oil and gas developments. If development from oil and gas and forestry increases in the boreal forest, there may be increasing public pressure on both industries, rather than on each industry separately, to address the social and ecological impacts of development.

Multiple Use Conflicts

The operation of both the petroleum industry and the forest industry on the same land base can result in various conflicts. These conflicts can be characterized as logistical or operational

conflicts, issues regarding fair compensation, and complications in planning and communication between companies.

Logistical and operational conflicts

Fragmentation of Blocks: Well-sites and pipelines are frequently located in cut-blocks of a Forest Management Area. Although pipelines are normally buried to a depth of five feet, the weight of a loaded log truck crossing over a pipeline could damage the pipe. In order to haul wood out of a cut-block with a pipeline running through it, FMA holders must construct a crossing of two or three feet of logs and dirt over the pipe. Another solution to this problem would be to bury the pipe at a much greater depth (nine metres) at known crossing areas, but this option takes coordination between FMA holders and oil and gas companies that in many cases is lacking. The increasing fragmentation of cut blocks by pipelines complicates the logging operations of the FMA holder.

Access: The construction and use of roads are other contentious issues between oil and gas companies and forestry companies. Currently, there is no legislation governing the use of access roads, although guidelines in the “Alberta Timber Harvest Planning and Operating Groundrules” state that timber operators should cooperate with other industrial operators to “coordinate and integrate their road planning and construction” (Alberta Environment 1994:31). Any coordination of road building is organized by individual companies on an ad-hoc basis or through committees that have been developed in different areas of the province. Forest companies have long-term road plans that they try to incorporate into their re-forestation plans. Oil and gas companies, on the other hand, do not tend to have long term plans for development. Therefore, an excess of access roads into an area can result where there is no effort to coordinate use. In some cases, the government may impose a road use agreement when negotiations between the oil and gas and forest companies fail. For example, an oil or gas company may be forced to utilise an FMA holder’s road as a condition of development.

Although efforts have been made by the industries to co-ordinate road use, conflict still exists. Both industries want roads to provide the most direct access possible to their respective areas of resource development. However their needs for roads differ significantly. For example, the sharpness of corners and degree of slopes that would suffice for oil and gas industry pick-up

trucks are inappropriate for loaded log trucks. In addition to this conflict, attempts to coordinate road use are made more challenging by the short time horizon and frequent planning changes characteristic of oil and gas development.

Coordinating salvage: Forest companies would like to salvage timber that has been cut for seismic lines and in the development of well-sites and associated facilities. Currently there are incentives for oil and gas companies to co-ordinate salvage with the forest companies, as the oil and gas companies get a rebate for any salvaged timber. However, as noted above, given the different planning horizons for the oil and gas industries and the forest industry, forest companies can find it difficult to arrange to pick up the timber on short notice.

In addition to being inaccessible to forest companies, timber from seismic lines is often unsalvageable, as the timber is usually severely damaged in the process of dragging, or skidding, logs out on a meandering seismic line. When timber is not bought back by the forest company, oil and gas companies must fully compensate the forest company for timber damage.

Some efforts have been made to minimize the number of seismic lines in a single area, the most notable being the government's "Guidelines for the Submission of the Geophysical Field Report" that requires companies to use existing seismic lines parallel to and within 400 meters of proposed seismic lines. Exceptions to this policy are made for various reasons. A gas company may argue, for example, that it is attempting to fine tune existing data for the site by cutting new lines, resulting in numerous seismic lines in one area (Cove, 2001). To further reduce the impact of seismic lines on the forest, the provincial government also encourages the use of low-impact seismic (LIS) techniques by offering a 50% rebate on timber damage compensation. LIS has many benefits, including reducing the width of seismic lines from the typical eight meters down to five meters or less, avoiding removal merchantable timber, and reducing the line of sight to less than 200 meters.

Reclamation issues: Different standards for reclamation for the oil and gas and forestry industries also create tension between the industries. Typically, reclamation is done by individual oil and gas companies and is not coordinated with other companies or with the long-term plans of forest companies. One area of contention is the lack of reclamation requirements for seismic lines, which are assumed to re-seed naturally. The seismic lines, however, provide an open corridor

for public and animal use, thereby reducing natural regeneration. In order to address this loss of timber, FMA holders would like to be able to incorporate seismic lines into their harvesting and reclamation plans, but with only 24-48 hours notice before exploration activities begin, it is difficult for the FMA holder to do so.

Reclamation of access roads is also regulated by different standards. Oil and gas companies must obtain a reclamation certificate for roads, while forestry companies do not. Many oil and gas companies avoid reclaiming their roads by turning them over to forestry companies, so long as the forest company plans to use the road within five years, as stipulated by Alberta Sustainable Resource Development.

Forest companies also try to incorporate access roads into their long-term plans so that reclamation can be done efficiently. Such plans can be stymied when an oil and gas company wants to develop an area that has recently been reclaimed. The money invested in the reclamation is then wasted as the area is opened up before the forest company can realize any benefits from the reclamation. Similarly, the reverse can occur when oil and gas companies have reclaimed an access road. This problem also applies to the reclamation of oil and gas well-sites and seismic lines. Oil and gas companies are currently required to re-seed the well-sites with grass but are not required to re-plant these areas. With their responsibility to maintain sustained yield, the onus is on the forestry companies to try to incorporate both well-sites and seismic lines into their long-term plans for reclamation. If this is not done, there is the risk that these areas will not return to productive use in the FMA.

Another issue that arises in the area of reclamation is the co-ordination between different government departments. Previously, the EUB was responsible for maintaining pipeline reclamation standards. However, recently the Land and Forest Service (LFS), now part of the Sustainable Resource Development ministry, took over this responsibility. Presently, the LFS has a shortage of qualified people to address pipeline reclamation issues. The split between the EUB and LFS responsibilities can make it difficult for companies in the field to know whom to turn to for expertise in a particular area.

Compensation conflicts

Land removals: Forestry companies are compensated for timber damage resulting from well-site, pipeline, or road development in their FMA, and often have the option to buy the timber back

from the oil and gas company. Nonetheless, they still express concern regarding permanent land withdrawals because of the loss of future productivity and the reduction in annual allowable cut. While seismic lines are expected to regenerate naturally, well-sites, roads and pipelines can usurp an extensive amount of land. Each well-site requires one hectare of cleared land and an access road, and there can be hundreds of well-sites on one FMA.

The significance of land removals for oil and gas developments is illustrated in Weyerhaeuser's Edson Forest Management Area. In the period from July 1997 to March 2001, 1,928 hectares of land had been removed from the FMA for well-sites and access roads, 2,162 hectares for pipeline right-of-ways, and 245 hectares for miscellaneous purposes (Varty, 2001). These removals totaled 4,335 hectares. In this same time period, Weyerhaeuser harvested 7,000 hectares. On a per year basis, oil and gas activities removed 1083 hectares per year from the FMA while Weyerhaeuser harvested 1400 hectares per year (ibid.). In another example, the FMA holder, Alberta-Pacific Forest Industries Inc., harvests approximately 10,000 hectares/year and quota holders 6,000 hectares/year while oil and gas companies operate on a land base of 11,000 hectares/year (Pope, 2001). Two additional notes should be considered in light of these figures: first, not all oil and gas activities occur on productive land; but, second, these figures do not account for disturbances to the land from seismic activities (Varty, 2001).

Disturbance of research plots: Oil and gas developments may occur in areas where an FMA holder has research plots. These plots are utilized by the FMA holder to study the long-term growth rates of the trees in an area. At times, oil and gas exploration activities cut through research plots, despite the recording of these sites in the provincial land standing information system. This conflict could be avoided by extending the notice period for extraction activities thereby ensuring enough time for forestry companies to provide exploration companies with up-to-date information on the location of their research plots.

Compensation for timber damage: Previously, oil and gas companies were concerned about the compensation rates for timber damage that occurred during exploration. Recently, however, the timber damage assessment tables have been updated, lessening concern over the rates of compensation. The current debate around this issue now centers on compensation for low-impact seismic or cases where avoidance cutting is utilized. At this time, the cost to create low-impact,

narrow width seismic lines is higher than for traditional, wider seismic lines. In deciduous areas, where the cost of compensation for timber damage is lower than for coniferous areas, it is often cheaper for seismic companies to cut wider lines and pay more in compensation than to use more expensive technology to cut narrower lines (Cardell, 2001). The Alberta Government has provided a rebate for the use of low-impact seismic lines, and the petroleum industry is in favor of forestry companies offering a similar rebate. Although exploration companies save money in timber damage compensation by utilizing low impact seismic technologies, these savings do not cover the entire cost of using these more expensive technologies.

Forest companies have their own concerns about proper compensation and have experienced situations where the cut-line widths stated in the preliminary and final exploration plan do not agree with the actual width of the cuts. In these situations, forest companies may be under-compensated for timber damage. Disputes about seismic lines could be minimized if their location and width are recorded using a form of GIS (Geographical Information System), with this information being shared with forestry companies.

Planning conflicts

Planning: One of the biggest differences between the two industries is the expectation for planning. FMA holders are required to have 20-year plans, five-year plans, and annual operating plans. They need to put in applications for road building well in advance of construction. Oil and gas companies, on the other hand, seek approval on a phase-by-phase basis for a particular development. Companies may develop long-term plans but they are not required to provide this information with their development applications. The difference in time frames between the two industries makes coordination of their activities difficult at the planning stage.

Notification: The short time frame for notification of oil/gas exploration can be problematic for forest companies. Oil and gas companies are not required to obtain approval from the FMA holders for undertaking exploration, but legislation requires that FMA holders are, at the very least, notified when exploration occurs. Before undertaking exploration in the FMA, oil and gas companies must only give 24-48 hours of notice to the FMA holder. For better planning to occur between the exploration company and the FMA holder, the notice period should be extended to several weeks, so as to better accommodate the forest industry's planning horizon.

Unlike exploration, prior to the commencement of development in an FMA, the oil and gas company must obtain the consent of the FMA holder. Oil and gas companies are under pressure to work quickly and efficiently, making it vital to receive consent from the FMA holder in a timely manner. Without FMA holder consent, oil and gas companies cannot pursue approval from the Land and Forest Service and the EUB nor proceed with their development plans. Although the FMA holder's ability to withhold consent is limited, they are capable of delaying the approval process.

Tension between the two industries arises when an FMA holder requires more time to review development plans and raises concerns, while at the same time, the oil and gas company is eager to begin development as quickly as possible. Such a dispute can be brought before the Minister of the Department of Sustainable Resource Development. If the Minister does not consider the FMA holder's objections reasonable, then the Minister can withdraw the land in question from the FMA.

By the time an FMA holder is notified of a proposed development, often a few weeks before construction is scheduled to begin, the oil or gas company has already invested in surveying the future development area, after which they are reluctant to change their plans. Earlier notification would allow FMA holders to suggest alterations to development plans that would make better use of existing seismic lines or roads before money is spent by oil or gas companies to survey for a specific plan.

Proprietary information: The secrecy surrounding the initial stages of oil and gas developments seriously constrains the ability for planning and coordination with the forest industry. Such secrecy makes the early notification of proposed oil and gas developments unlikely. Although oil and gas companies may develop long-term plans, due to the competitive nature of the industry, these plans are kept confidential until the application phase, when notification of FMA holders is required. The need for secrecy in the early stages of planning is thoroughly entrenched in legislation such as the Confidentiality Clause in the Mines and Minerals Act (Cove, 2001) and is unlikely to change.

Interaction: Planning is complicated further by the number of actors working on the land base. Oil and gas companies may have to deal with the Crown as well as several FMA holders for a

proposed development. In a single FMA, there may be hundreds of oil and gas companies working in the exploration, development or reclamation phases of the petroleum industry. In addition to the sheer number of companies an FMA holder may have to deal with, oil and gas well-sites and pipelines frequently change ownership, creating mounds of paperwork for the FMA holder and making it difficult to establish good working relationships with any single oil and gas company.

III. CURRENT INTEGRATED RESOURCE MANAGEMENT INITIATIVES

Overview and history

Definitions of IRM

Integrated Resource Management has been defined as the “management of two or more resources in the same general area and period of time (e.g. water, soil, timber, grazing, fish, wildlife and forests),” involving “setting planning and management goals, objectives, strategies and policies in a cooperative framework among all resource users” (Dunster and Dunster, 1996 as cited in Alberta Environment, 1999a:25).

Alberta Environment defines IRM as “an interdisciplinary and comprehensive approach to land and natural resource management decision-making that strives to maximize society’s long-term benefits and minimize conflicts.” The IRM approach is based on “cooperation, communication, coordination; consideration of all values; and consultation before action” (Alberta Environment, 1999a:3).

History of IRM in Alberta

Alberta currently lacks a comprehensive land-use planning framework. In the late 1970s, an Integrated Resource Planning (IRP) process was developed. It existed for approximately two decades before being abandoned. This planning process, initiated under the Eastern Slopes Policy, was aimed at ensuring that public lands and resources were protected, managed or developed according to a philosophy of integrated resource management. The process was based on a multiple-use policy where resources are simultaneously allocated to a range of users to maximize aggregate benefits of public lands and resources. These IRPs were meant to integrate non-industrial and industrial uses, and were not primarily aimed at integrating two or more industrial uses. Integrated Resource Plans (IRPs) identified eight land use zones, each with a

range of permitted, compatible and non-permitted activities, but did not address the potential impact of placing different zones in relation to each other (Kennett and Ross, 1998).

IRPs required an interdepartmental planning approach, some public involvement and final Cabinet approval. The process involved many levels of decision-makers and was very time intensive. While the IRP's were being developed, resource allocations and development continued, which undermined the purpose of an IRP (Kennett and Ross, 1998).

A number of IRPs were developed for various regions of the province, and existing IRPs, though outdated, are still used as guidelines by various government decision-makers. For instance, the Crown Mineral Disposition Review Committee, which reviews applications for mineral rights dispositions, takes existing IRPs into consideration when issuing its recommendations to the Minister of Energy. The EUB and NRCB regulatory boards also refer to existing IRPs in their review of specific projects. The extent to which IRPs influence final agency decisions, however, is not clear.

In March 1999, the provincial government released the "Alberta's Commitment to Sustainable Resource and Environmental Management" policy. This policy states that "resources such as trees, minerals, wildlife, fish, range, public land and plants shall be managed in a manner that addresses their interdependence, and recognizes that the use of one resource can affect other users and other resources." It further states that "regional plans will provide a level of detail between provincial policy and operational decision-making." Two key bodies have been created in response to this legislation. In the department of Alberta Environment, an Integrated Resource Management division has been established and is responsible for overseeing policy implementation. As well, Regional Environment Resource Committees have been created which are responsible for implementing the policy at the regional level. Two regional strategies are currently being developed and are discussed in more detail below.

Despite the intentions of this new policy, there are significant challenges for province-wide IRM. The Alberta government has neither a mechanism to coordinate land management efforts nor a way to coordinate the various legislation governing public land management (Kennett and Ross, 1998). Accordingly, Alberta's land management legislation has been criticized as resembling a "patchwork quilt," recognizing a serious need for the province to adopt an "integrated body of public land law" (Kennett and Ross, 1998:vi).

Current Efforts

A number of efforts to integrate activities between natural resource industries have emerged recently from both government and industry. The government of Alberta reports that there are nearly 300 examples of efforts towards integrating the activities of multiple resource sectors, that address a variety of concerns, such as air and water quality and protected areas management (Alberta Environment, 2001). Some high-profile initiatives include the provincial government's regional strategies as well as several industry-initiated projects.

Provincial Government Initiatives

The provincial government has a series of pilot regional strategies aimed at assessing the feasibility of province-wide IRM. If successful, these regional IRM plans will replace previously developed IRPs (Land and Forest Service, 1998). Two pilot projects now underway, the Regional Sustainable Development Strategy for the Athabasca Oil Sands Area (RSDS) and the Northern East Slopes Sustainable Resource and Environmental Management Strategy (NES). These projects are still in the planning or early implementation stage, limiting our ability to evaluate their effectiveness at this time.

The RSDS was developed to address the impacts of intense resource development in the Athabasca oil sands area in the northeastern region of the province (Alberta Environment, 1999b). The RSDS will establish a resource management framework for the region, emphasizing the development of IRM in the context of continued economic development. The RSDS land management goals and objectives were completed in 1999, and are in the process of being implemented (Alberta Environment, 1999b).

The NES involves the northern foothills region of the province, and aims to incorporate a range of stakeholders to address the impacts of development, while maintaining economic, social and environmental well-being (Quintilio, 2001). The terms of reference for the NES are complete and have been endorsed by all involved parties as of early 2000. The initial consultation and communication objectives are underway (Alberta Environment, 1999b).

Industry Initiatives

Alberta Pacific Forest Industries: Alberta Pacific Forest Industries (Al-Pac) has four proposed pilot projects to improve the integration of forest harvesting with oil and gas activities in its

FMA. The most high profile initiative is to develop a strategy for an oil sands project with Gulf Canada. This particular project intends to identify opportunities at the planning stage for the sharing of roads and the integration of well-sites with cut-blocks (Pope, 2001). Al-Pac is working on similar strategies with True North Energy and Opti Canada, and is also trying to assess the feasibility of encouraging low-impact seismic exploration in its FMA.

Alberta Chamber of Resources (ACR-ILM): The Alberta Chamber of Resources has recently released its plan to implement an Integrated Land Management program to promote the coordination of activities between Alberta's natural resource industries. This program is based on the initiative between Alberta Pacific and Gulf Canada (Alberta Environment, 2001). The goal of the ACR-ILM program is to reduce impacts of industrial development through research as well as the improved coordination of activities between natural resource sectors (Koning, 2001). The ACR has established an industrial research chair at the University of Alberta and is working to improve communication between natural resource sectors (ibid.).

Alberta Joint Energy/Utility and Forest Industry Management Committee: The goal of this committee is to improve the coordination of activities of oil and gas and forestry companies working on the same land base. A provincial government representative, as well as organizations representing the forestry, oil and gas, and mineral industries make up this committee. The initial focus of this group was to address timber damage assessments, but this focus has expanded towards standardizing and simplifying the interactions between FMA holders and oil and gas companies.

IV. SUMMARY AND DISCUSSION

The boreal forest ecoregion occupies half of Alberta and represents over a tenth of Canada's boreal forest (Johnson et al, 1995). It has an important ecological function as it provides critical habitat for hundreds of wildlife species including threatened wildlife such as Woodland Caribou and Neotropical Migratory Birds (Natural Resources Service, 1998). This ecoregion also plays a fundamental role in watershed management for the province (Strong and Leggat, 1992). The northern boreal forest has historically been home to numerous First Nation and Metis communities, and more recently, several resource-dependent communities of European descent.

Given the central role the boreal ecoregion plays both ecologically and socially, emerging concerns regarding the impact of rapid, intensive resource development are well warranted. One of the most significant characteristics of recent industrial activities in northern Alberta is the development of multiple resources upon the same land base, which is exacerbating the cumulative impacts of resource development. Given the current situation of resource-specific policy regimes, incompatible development time horizons, and distinct levels of economic and, thus, political power, few could argue against the need for a new approach to resource development and land management.

Integrated Resource Management has been introduced as a means to alleviate conflicts between natural resource sectors, and reduce the level of cumulative impacts to the land base. The concept itself holds great promise, but whether this concept can be implemented effectively and lead to the anticipated changes in development and management is still far from clear. This working paper represents only an initial report of findings to date in a multiple-phase research project. Nonetheless, several key initial findings have been identified in terms of the opportunities and constraints associated with Integrated Resource Management. This final section will summarize these findings and conclude by outlining the next phases of research.

Initial Assessment of Opportunities

Considering the number of recent IRM initiatives, one could conclude that the opportunities for IRM are extensive. We must emphasize, however, that these cases represent only a limited set of circumstances that may not be sufficient to induce comprehensive IRM on a broader level. Furthermore, these initiatives are still far too young to allow any significant assessment of their success. In general, however, a number of opportunities appear to exist that may encourage further IRM planning.

First, Integrated Resource Management represents the possibility for long-term planning, and the standardization of regulatory procedures across northern Alberta's resource industries. All resource-based industries thus would benefit from the implementation of IRM throughout the province. The incentive for working toward these benefits is particularly acute for those industries that require long-term planning, such as the forest industry, but the gains in regulatory efficiency and standards would benefit all resource users, who currently face a morass of legislation and regulatory bodies with overlapping jurisdictions.

Second, the Government of Alberta has expressed support for IRM in recent policy, in the development of a new IRM division, and in the initiation of several new pilot projects. These recent actions by the provincial government suggest a willingness to address some of the primary hindrances to IRM--existing regulatory regimes. A window of opportunity thus may exist to encourage the regulatory and institutional reforms that will be necessary for comprehensive implementation of IRM.

Finally, because IRM represents the potential for more effective mitigation of the cumulative impacts of resource development, its implementation will lead to improved relations with First Nation and stakeholders in northern Alberta communities, as well as healthier ecosystems and sustainable economies.

Initial Assessment of Constraints

Despite these opportunities, numerous constraints must be addressed before IRM can be extended. Many of these constraints have already been introduced throughout this paper, so they will be briefly summarized here.

The distinctions between the oil and gas industry, based on a non-renewable resource, and the timber industry, based on a renewable resource, represent fundamental discrepancies in planning, development, and management, as well as the sheer number, size, and longevity of individual companies. The competitive relations among oil and gas companies represents a particular constraint, not only causing an unnecessary level of impact from exploration activities, but also limiting the potential for intra-industry cooperation. These discrepancies inevitably complicate efforts at integrated management. The oil and gas and forest industries, furthermore, are characterized by differing incentive structures, and different levels of economic power, which influence the perceived political power and willingness to negotiate among these industries.

At a policy level, comprehensive IRM may be complicated by the fact that major industries such as forestry and oil and gas are regulated by separate policy regimes and there is no single regulatory framework or policy that requires industries to cooperate. Moreover, the provincial government does not have a comprehensive land-use policy for the boreal forest. Instead, natural resource industries are characterized by a complicated maze of policies, and multiple regulatory bodies with differing jurisdictions, neither of which are conducive to comprehensive integrated management planning. In addition, the regulatory process for oil and gas currently appears to be

characterized by a comparatively cursory review and limited monitoring. Given this situation, combined with the secretive nature of oil and gas development, there would appear to be little incentive on the part of certain oil and gas operators to voluntarily adopt a planning process that would likely involve greater levels of planning and review by multiple parties.

Finally, the initial development of Integrated Resource Management may require significant financial commitments. Considering that the provincial government has been cutting back its revenue allocation to natural resource regulation in recent years, the probability of large provincial investments are unlikely in the near future.

Taking the Next Steps

This working report represents only the first phase of a three-phase research project, so any conclusions drawn must be considered preliminary at best. In the next phase of the project, we will be interviewing approximately 50 key informants across the many relevant sectors involved in northern Alberta resource development, including: representatives working in the forest and oil and gas industries; government agents in the several provincial and federal regulatory bodies with jurisdiction over these industrial activities, representatives of First Nations whose lands and territories may be sited of industrial forest and oil and gas development, and actors within non-governmental organisations that have been involved in the oversight of northern resource development. From these interviews, we hope to identify the multiple understandings of IRM and its anticipated relevance to northern resource development, characterise existing relationships among resource users, regulators, and other interest groups, and assess perceptions of the effectiveness of the current regulatory regimes governing resource development in northern Alberta.

In the final phase of the project, we will conduct a comparative case study of several northern, resource dependent communities that are differentiated by the level of IRM that has been attempted, and by the degree of political conflict among interest groups. In this final phase, we will be able to move beyond the stated perceptions and intentions of key informants, and be able to characterise the many indirect social and environmental impacts of intensive multiple resource use. With these case studies, we can assess the impacts of existing IRM initiatives, and develop a more comprehensive picture of the opportunities and constraints that exist for IRM planning, and assess the intended and unintended results of such initiatives.

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