World Wildlife Fund Canada

Intervention (with colour maps)

to the Joint Review Panel for the Mackenzie Gas Project.

Submitted by:

WWF-Canada

To:
Joint Review Panel for the MGP, Registered Intervenors

February 10, 2006

WWF for a living planet®

Table of Contents

WWF for a living planet®

Executive Summary

World Wildlife Fund is one of the largest independent conservation organizations in the world, with projects in over 100 countries. Our mission is to help build a future in which humans live in harmony with nature. WWF is not an anti-development, anti-hunting, anti-trapping or anti-sealing organisation. Our work focuses on getting the balance right in long-term, truly 'sustainable' solutions that will benefit future generations of people and wildlife, and the vital natural systems upon which we all depend.

In Canada WWF has worked for over 30 years in support of northern community-based conservation initiatives. We remain a strong partner, with regional Aboriginal organisations, governments, industry and other NGOs in the community-based NWT Protected Areas Strategy (PAS). We believe that the PAS Action Plan to 2009 should be fully implemented in 16 key ecoregions of the NWT's Mackenzie Valley in order to protect a full and representative network of special cultural and ecological areas for the future, while the opportunity still remains intact.

WWF's aim in intervening in the JRP and NEB Hearings on the Mackenzie Gas Project is to provide helpful information and viewpoints based on our substantial global and regional experience in such matters. We believe this will help ensure that any final decisions and conditions to proceed in this new Century of northern development satisfactorily reflect the long-term societal needs to properly balance and sequence conservation values with industrial development values.

Based on all past experience in relevant situations, and all credible projections for energy supply and demand in the North American continent and beyond, it is inevitable that a basin-opening MGP gas pipeline corridor will induce very significant accelerated industrial activities in the broad region, likely for the remainder of the 21st Century. Therefore, it is vital that a comprehensive and thorough Strategic Environmental Assessment be completed for the region, and that the JRP use state-of-the-art approaches to cumulative impacts assessment for the inevitable induced development in the region.

The most comprehensive and thorough review of multi-decadal impacts (both positive and negative, short-term and cumulative) of a newly opening petrochemical basin is that from the Alaskan North Slope in the latter part of the 20th Century – involving situations that are very comparable to those in the NWT at this stage of the proposed MGP initiative. The approaches taken by, and lessons learned from, this U.S. Congress initiated review (which was published by the National Academies of Sciences in 2003) are summarised in this WWF intervention, and will be presented in person to the JRP in Inuvik by the chair of the U.S. National Research Council committee that performed this review, Professor Emeritus Gordon Orians.

WWF for a living planet®

WWF makes nine recommendations to the Joint Review Panel, in the hope that these will be helpful in your work over the coming months, and in completing your final report to the National Energy Board.

These recommendations are:

1. ***That the Cumulative Effects Assessment and Management (CEAM) Strategy and Framework, and Blueprint Actions be utilised and resourced fully, with strong engagement from industry including the MGP Proponents, to develop and implement a suite of effective mitigation measures.***

2. ***That well-balanced, long-term land use plans be completed and approved for the Sahtu and Dehcho regions in the NWT prior to any major decisions on the MGP, or associated development projects affecting these regions.***

3. ***That in order to satisfactorily meet conservation commitments made in the NWT, especially in the 16 ecoregions directly or indirectly intersected by the proposed MGP pipeline, no new allocations to industrial exploration or development access be granted until habitat conservation measures such as the interim protection of a network of culturally and ecologically significant areas (essentially VECs using the EIS terminology) be completed.***

4. ***That the five-year NWT Protected Areas Strategy (PAS) Action Plan be fully implemented by 2010, meeting commitments made by all PAS partners and the federal and territorial government responsible Ministers to reserve an adequate and representative network of special cultural and ecological areas in the 16 Mackenzie Valley ecoregions identified by the Action Plan and recognised by the Joint Review Panel and other key government agencies.***

5. ***That an adequate network of large natural areas free from regional/local industrial activity and impacts be available as benchmark reference areas in comparable ecoregions, from which to satisfactorily monitor and assess any environmental impacts attributed to the MGP pipeline and future induced industrial activity.***

6. ***That a robust network of protected areas be established as anchor areas of high conservation value before any further industrial allocations or major decisions are made, in order that ecosystem resilience to the stresses and uncertainties resulting from rapid climatic change be maximised.***

7. ***That a well-resourced and sustained, transparent environmental monitoring regime be put in place upon any MGP approvals, along with sufficient posted bonds from the MGP Proponents and subsequently induced development projects in the region, to ensure that ecosystem impacts are both detected and then promptly and satisfactorily addressed by development project partners, and not by the general public at some later date.***

8. ***That the federal government integrate into the NEB, JRP and Board approvals processes for the Mackenzie Valley a full Strategic Environmental Assessment approach before finalising any approvals of the basin-opening MGP, consistent with the 1999 cabinet directive on SEA.***

9. ***That a final public interest decision be made on the basin-opening MGP proposal in the context of a progressive, robust, specific, clear and effective national and/or continental sustainable energy strategy. Development of the Canadian sustainable energy strategy should be initiated immediately.***

1. Introduction

World Wildlife Fund is one of the largest independent conservation organizations in the world, with projects in over 100 countries. Our mission is to help build a future in which humans live in harmony with nature. WWF is not an anti-development, anti-hunting, anti-trapping or anti-sealing organisation. Our work focuses on getting the balance right in long-term, truly 'sustainable' solutions that will benefit future generations of people and wildlife, and the vital natural systems upon which we all depend.

In Canada WWF has worked for over 30 years in support of northern communities. In fact, our President Emeritus, Monte Hummel, testified at the Berger Inquiry 30 years ago. Many of the points which Monte, northerners and Justice Berger made then, are still relevant today. For the past decade, WWF has had an office in NWT, led by Bill Carpenter. Bill was formerly with the Métis Nation, and many northerners know him for his pioneering veterinary work in the NWT, rescuing the Canadian Eskimo sled dog breed earlier in his career.

WWF has provided substantial financial, technical and political support to many community conservation projects on wildlife species, toxic chemicals, climate change, traditional knowledge and mapping work, especially for community-initiated protected areas. WWF remains a strong partner in the multi-partner NWT Protected Areas Strategy. We believe firmly that such community-driven initiatives, combined with high quality land and resource use planning, provide the best approaches to seize Canada's world-class conservation opportunities while they still remain relatively intact. WWF has worked with the Mackenzie Gas Project (MGP) team, and with many other companies in Canada and worldwide, to help forge better all round approaches and solutions. For industry, collaborative solutions provide certainty, by avoiding unnecessary conflicts and risks in the future.

WWF looks forward to providing genuinely helpful inputs to the JRP over the coming months. We will be supporting many northerners in their calls to confirm the key conditions under which any major energy pipeline might be approved. At the front end of such a major hydrocarbon basin opening, our

shared concern is that the long-term interests of northerners, and the natural ecosystems and wildlife upon which we all depend, will be assured.

In our view Canada can and must show strong international leadership on a new approach to industrial development in so-called 'frontier' regions through major showcase projects like the MGP. The MGP presents an unprecedented opportunity for Canada to create a best- in- class model for how to integrate economic development with sustainable livelihoods while truly protecting the environment. Only in this way can society avoid the mistakes made elsewhere in the world through poor planning and short-term decision-making, which always lead to socio-cultural and environmental problems for local people and ecosystems – usually as a legacy for future generations to deal with.

WWF's aim in intervening in the JRP and NEB Hearings on the Mackenzie Gas Project is to provide helpful information and viewpoints based on our substantial global and regional experience in such matters. We believe this will help ensure that any final decisions and conditions to proceed in this new Century of northern development satisfactorily reflect the long-term societal needs to properly balance and sequence conservation values with industrial development values.

WWF globally on oil & gas projects

For over thirty years, WWF has been working with the Oil and Gas sector worldwide. The intersection between hydrocarbon activity and biodiversity is becoming more pervasive, as technology and rising oil and gas prices make new frontier areas feasible for exploration and production. Multinational oil companies continue to externalize costs and responsibilities, by exerting influence over legal structures, governments and stakeholders. WWF's experience worldwide and involvement in assessing mega-projects has identified the need for more strategic involvement at all stages of development of hydrocarbon activity in a region, from conception through construction, maintenance, expansion, decommissioning, and abandonment. WWF has continued with its approach of constructive engagement utilising the access gained by a credible science-based platform. WWF's work in the sector is conducted in the wider context of sustainable development, including the interests of local communities, livelihoods, and energy needs.

In recent years, WWF has participated in wide-ranging negotiations with some of the world's largest oil and gas projects. This has included interventions in: the Chad/ Cameroon pipeline, the Niger Delta, the Chinguetti project in Mauritania, the Camisea pipeline in Peru, the BTC project in the Caucasus, the Sakhalin integrated oil and gas project in the Russian Far East, the Chiquitano project in Bolivia/ Brazil as well as interventions in Norway, Russia, East Africa, UK, Nepal, Papua New Guinea and the US Arctic. In every case, the result of WWF's intervention has been to change the scope of the projects away from narrowly construed permitting procedures that lacked vision and failed to in accommodate and plan for the inevitable induced development from both continued hydrocarbon activity and other infrastructure development, especially road building. The MGP shares these features with other large projects falling into this category. The conditions and regulations under which it is developed will greatly influence how industrialization and energy development will proceed in the Canadian north and how well the social and environmental consequences of those actions will be managed. Canada has the

opportunity to apply the principles of sustainability to all aspects of the MGP project that will impact the ecology and livelihoods of northern people for decades to come. Many of these same principles are found at the heart of settled Aboriginal land claims agreements in Canada.

WWF has engaged with Multilateral Development Banks, Export Credit Agencies, and commercial actors, in particular private banks who are signatories to the Equator Principles. WWF participated within a global coalition of over 300 civil society groups in the World Bank's Extractive Industries Review, was an active voice in Harvard's Oil Policy Dialogue together with many other government and private sector sponsored policy initiatives on best practice for the hydrocarbon industry.

Throughout each project or policy negotiation, WWF has been afforded access to top decision makers in government, industry, the financial sector while working in partnership with locally affected indigenous communities, local, national and international civil society groups that represent social, environmental, human rights, and gender issues. This has allowed WWF to understand the direct linkages and impacts that occur from oil and gas activities. In most cases, the lack of strategic tools in place to guide decisions has often led to tension, disruption and conflict. This has, in turn, led to environmental degradation, social dislocation, poverty enhancement and loss of livelihood.

WWF continues to promote and offer tools to improve decision-making, such as Strategic Environmental Assessments (SEA), Protected Areas Systems, and Particularly Sensitive Sea Areas (PSSAs) that are designed to promote regional and national planning, incorporate civil society voices, especially from marginalized segments, analyse cumulative impacts from industrial development, and plan alternative scenarios. WWF recently participated in the SEA for the Barents Sea conducted by the government of Norway and recommends the Canadian government initiate a similar procedure before approving the MGP and any further industrial allocations in the region.

This written intervention to the 2006 Hearings of the Joint Review Panel for the MGP has three main sections, all related ultimately to the JRP's role and Terms of Reference and the best ways to approach environmental assessment of cumulative impacts arising from the MGP and reasonably foreseeable induced developments in this large hydrocarbon rich region. We hope that the recommendations WWF makes for the JRP, and ultimately the National Energy Board, will be helpful in ensuring that any future major industrial developments in this region proceed in manner that is consistent with both the wishes of northerners and with public expectations around sustainable development and commitments to non-industrial values.

WWF for a living planet®

2. Progress to date by the Proponents on assessment of cumulative induced development impacts

Regarding the EIS of August 2004, and Additional Information (March 2005) filed by the MGP Proponents, WWF and other interveners (e.g., Indian and Northern Affairs Canada, and Environment Canada) have made a number of requests and suggestions for ways in which the Proponents might fully address the EIS Terms of Reference on cumulative induced developments, and thereby better inform the JRP and public about the foreseeable impacts (both positive and negative) of cumulative industrial development in the region, triggered initially by the current and very large MGP 'basin-opening' major gas pipeline proposal. There have been various Information Requests (IRs) and responses on this issue (see the Public Registry), as well as Additional Information filed by the Proponents (March 2005), trying to better satisfy the JRP's Terms of Reference, requests, and overall comprehensive and thorough scope sought for the EIS, and the initial MGP project's subsequent environmental assessment.

However, it is clear that some very significant gaps still exist, especially concerning information on regional biophysical values/VECs, and existing or likely candidate protected areas that would be impacted in various ways by accelerating industrial developments in this hydrocarbon-rich region over the coming decades. Within the 10 NWT ecoregions directly intersected by the MGP proposal, and the 6 others that would be affected by associated infrastructure, the Proponents have not provided information to allow a credible assessment of cumulative effects on areas of high conservation value within these ecoregions, or how the commitments to fully implement the NWT PAS five-year Action Plan would be affected by such cumulative developments. Appendix map 6 of our intervention here contrasts the EIS Supplementary information filed map with key HCV areas for the 16 ecoregions currently used by WWF and other partners in the NWT PAS work. WWF has repeated its willingness to work with the Proponents to help provide the best current information on conservation values in these 16 ecoregions.

Of particular concern to WWF and some other interveners are the often premature and poorly substantiated conclusions provided by the Proponents that future impacts would either be small, insignificant, or easily mitigated. The JRP and it's staff and advisors certainly are well aware of these persisting deficiencies (see WWF's Information Requests to the MGP proponents, and their responses, WWF_R1_01, and R2_01; and also WWF's written submission to the June 2005 JRP Information Sufficiency Conference in Yellowknife, and the facilitator's final report to the Panel – provided here as an Appendix in the CD version).

It remains WWF's opinion, and recommendation to the Panel and NEB, that mitigation measures such as full and timely implementation of the NWT Protected Areas Strategy five-year Action Plan would help in very significant ways to manage and offset the inevitable significant adverse impacts on Valued Ecosystem Components (VECs) of cumulative industrial developments in the region. Inclusion of such measures and conditions in plans and any approvals for an MGP energy corridor is essential if this

basin-opening project is to be consistent with the purpose and principles upheld by the JRP, NEB and public government commitments to 'sustainability', and cumulative effects assessment and management frameworks.

Such comprehensive networks of representative protected areas (special cultural and ecological areas, high VEC values) would serve multiple beneficial functions within an effective 'Sustainability Framework', while industrial activities expand dramatically in this important and relatively intact large river basin.

Among these functions are the following:

- Delivering on the expressed wishes of northern communities to reserve areas important to them while they still can;
- Providing essential reference/ benchmark areas in comparable ecoregions against which to meaningfully assess ecosystem impacts allegedly attributable to the pipeline and associated oil-gas developments and the infrastructure network that supports them. Data gathered from these areas can potentially provide a basis for avoiding unnecessary costly remediation/mitigation if it were clear that they were not actually attributable to the MGP or induced construction activity;
- Provide the region a fundamental core element of an optimum adaptation strategy for dealing with ecosystem consequences of rapid climatic change/warming (see Appendix Maps 3a and 3b);
- Safeguarding a network of areas of high cultural, spiritual, ecological and wilderness/aesthetic value for future generations of Canadians – both northern and southern, to benefit from in ways that we can only dimly predict at this point in time;
- Protecting areas of critical habitat for designated 'species at risk' (under both federal and territorial government species legislation);
- Retaining properly functioning natural ecosystems, thereby providing significant (though as yet not accounted for in Canada's National Accounts) natural capital/ecosystem service values for society. (For further explanation see Anielski & Wilson 2005 report for Pembina Institute/Canadian Boreal Initiative, 'Counting Canada's Natural Capital: Assessing the Real Value of Canada's Boreal Ecosystems').

WWF for a living planet®

3. Cumulative industrial developments and assessment of their impacts at the regional scale

i. Development progression experiences in oil & gas basins, with special focus on the Alaskan North Slope.

For at least the past 20 years, WWF has worked with local communities, oil-gas companies, governments and other organisations in many parts of the world at the planning and assessment stages of new development of frontier' oil-gas basins (for further details see sections 1 and 3 of this intervention).

In every case, a basin-opening energy corridor or initial series of productive wells have led to further accelerating industrial development, both of hydrocarbons, and other resources and human activities stimulated by improved linear access and changed economic conditions. We have also seen how local communities and wildlife and ecosystems have experienced significant adverse impacts, both short-term and long-term, including those persisting long after the companies have gone or have sold their share to smaller companies. Properly balanced approaches have rarely if ever been put in place.

Perhaps the most comprehensive and thorough review of multi-decadal impacts (both positive and negative, short-term and cumulative) of an newly opening petrochemical basin is that from the Alaskan North Slope in the latter part of the 20th Century – involving situations that are very comparable to those in the NWT at this stage of the proposed MGP initiative. The approaches taken by, and lessons learned from, this US Congress initiated review form the remainder of this section. The chair of the U.S. National Research Council committee that performed this review, Professor Emeritus Gordon Orians, will present his points and recommendations in person to the MGP Joint Review Panel in February in Inuvik.

Lessons Learned from the Northern Alaska Experience

Oil and gas activities on Alaska's North Slope have produced more than 14 billion barrels of crude oil over the past four decades. Those activities have brought positive and negative consequences—economic, social, and environmental—to the region. A thorough analysis of those effects has been carried out by a committee of the National Research Council, the working arm of the U. S. National Academy of Sciences (NRC 2003. *Cumulative Environmental Effects of Oil and gas Activities on Alaska's North Slope*). The conclusions of that study can serve as "lessons learned," to help guide future industrial activities carried out elsewhere under the extreme climatic conditions of the Arctic. With respect to proposed industrial activities in the Delta and Valley of the Mackenzie River, the following findings of the NRC Committee are especially relevant.

for a living planet®

Pattern of Growth of Industrial Activity

Industrial activity on Alaska's North Slope has grown over the past 30+ years from a single operational oil field at Prudhoe Bay to an industrial complex of developed oil fields and their interconnecting roads, pipelines, and power lines that stretch from the Alpine field in the west to Badami in the east (see Appendix Map 1 to this intervention). A highway and oil pipeline cross the State from near the Arctic coast to Valdez on the south coast. This network has grown incrementally as new fields have been explored and brought into production. Such incremental expansion characterizes all such oil and gas developments because the existence of the infrastructure network makes profitable the exploitation of nearby fields that would not otherwise be economically viable.

The hydrocarbon fields in northern Alaska, like such fields elsewhere, contain large quantities of both oil and natural gas. Currently, no way exists to transport the gas from the North Slope to markets, so it is injected back into the field from which it was extracted, where it maintains pressure that facilitates removal of additional oil and from which is can be re-extracted at a future date. The value of that huge reserve of natural gas, in turn, is generating strong pressures for construction of a gas pipeline, with its attendant array of support facilities. Such natural gas developments, should they occur, will be accompanied by additional cumulative environmental effects.

Thus, comparable incremental growth and expansion of an industrial complex is certain to happen if a gas pipeline is constructed in the Mackenzie River valley. Such foreseeable consequences need to be anticipated, planned for, and incorporated appropriately into the regulations that would be imposed on the first 'basin-opening' gas pipeline corridor project.

Direct Effects of the Industrial Activity

The existence of permafrost imposes special requirements on industrial activities in Arctic regions. Structures must be built in ways that do not melt the underlying permafrost. Thus, all buildings must be constructed on pilings to that cold air circulates beneath them. Any pipeline that carries hot oil also must be similarly elevated. Gravel roads and gravel drill pads must be at least two meters deep so that the thaw zone is confined within their beds. Therefore, construction of every kilometer of road requires large quantities of gravel, which must be mined from local sources, such as riverbeds. The roads interrupt surface drainage patterns, causing roadside flooding and roadside snow accumulation and thermokarst. They are also sources of dust that may be carried for considerable distances.

In addition to such effects on the physical environment, industrial activity has direct effects on animal populations. In northern Alaska, industrial activity has displaced the calving grounds of the Central Arctic caribou herd, causing reduced reproductive performance during years of heavy insect harassment. Seismic exploration activities offshore displace migratory bowhead whales, upon which coastal human communities depend.

Although some animals have been negatively affected by industrial activities on the North Slope, others have benefited. Among the most important beneficiaries have been grizzly bears, Arctic foxes, ravens and glaucous gulls – opportunistic northern species that readily adapt to increased human activities and the inevitable anthropogenic food sources they generate. Heavy predation by these animal species on nesting birds has lowered the reproductive rates of some species in the oil fields so much that the populations in those areas are now probably maintained only by immigration of individuals from areas where reproductive success is better. If industrial activity continues to expand, the extent of such "sink populations" is likely to expand, adversely affecting the ratio of source to sink populations and eventually leading to overall population declines. Strict regulation of anthropogenic food sources is required if such adverse effects are to be avoided or, at least, reduced.

Indirect Effects of Industrial Activity

The existence of the infrastructure network that supports the industrial activity inevitably stimulates indirect effects. For example, roads create easy access to areas that were formerly difficult to reach. Recreational use of adjacent areas by hunters, fishers, hikers, and others have increased in northern Alaska. The industrial developments have also caused major changes in the economic and social structure of human communities in the area. Indeed, in northern Alaska, massive political and economic changes occurred before a single barrel of oil flowed south from the North Slope!

The Legacy of Industrial Development

In northern Alaska, the oil industry and regulatory agencies have made dramatic progress in reducing the effects of new gravel fill by reducing the size of the gravel footprint required for many types of facilities and by substituting ice for gravel in some roads and pads. Nevertheless, when industrial activity declines, which it inevitably does as exploitable fields are economically exhausted, a legacy of structures will remain. Unless restoration of those structures is legally mandated and resources are allocated to accomplish those activities, abandoned and unrestored structures are likely to persist for centuries because natural recovery in the Arctic is slow.

Unfortunately, this serous problem has received insufficient attention in Alaska. Little effort has been directed to restoring already disturbed sites. For example, to date only about 1% of the habitat on the North Slope affected by gravel fill has been restored. Moreover, with the exception of well-plugging and abandonment procedures, state, federal, and local agencies have largely deferred decisions about the nature and extent of restoration that will be required. Not all sites may need to be restored, but unless responsibility is legally established, little restoration is likely to occur because restoration will be extremely expensive. The total cost of comprehensive restoration on the North Slope is not known accurately but it is estimated to be in the billons of dollars. Restoration costs in the Mackenzie Valley are unlikely to be much less.

Social and cultural legacies are also inevitable. Industrial activity on Alaska's North Slope has generated income for local communities that have produced many positive benefits. Nevertheless, no alternative income sources sufficient to maintain current standards of living have been identified. Therefore, plans for the economic future of communities directly affected by industrial activities need to be developed so that the highly negative, undesirable and risky effects of "boom and bust" economic development can be avoided or at least reduced.

ii. Likely/foreseeable development scenarios for the Mackenzie Valley and Beaufort region.

WWF agrees with the Proponent and the Government of Canada that increased industrial activity in the Mackenzie Delta, Beaufort Sea, Central Mackenzie Valley and Colville Hills regions (or any other area in which induced development occurs) are certain to result in cumulative impacts that will necessitate significant mitigation and other measures in order to ensure that land and resources in these areas can be used 'sustainably' into the future. It is very clear from even a cursory glimpse of the estimated huge untapped natural gas reserves in these northwestern Canadian and northern Alaskan basins, that substantial future gas developments are inevitable here for the remainder of this Century (see Appendix Map 2 in this intervention). Substantial crude oil reserves are also highly likely to be extracted in the coming decades from these same hydrocarbon fields. Further, industry and scientific experts have estimated that by the middle of the 21st Century, advances in engineering techniques may well allow the massive reserves of methane gas hydrates currently locked in the permafrost in this region to be moved to markets in the south.

Experience around the world shows clearly that there are both positive and negative impacts of cumulative developments in natural/frontier regions, and that wise management and effective mitigation of adverse impacts, and reduction of future project-associated or induced risks, requires careful advance planning and investment in a range of sustained measures.

WWF agrees with many experts in this field that rather than attempting to predict and quantify a most likely future scenario, it is crucial to understand the scope of possible/foreseeable futures in a region. In so doing, society and CEA practitioners will then be able to help inform and support the development of effective management strategies in the region, to allow ecosystems and people to best manage the risks associated with future developments. Various attempts have been made to model development scenarios for portions of this hydrocarbon-rich region – ranging from restricted to expansive in their input parameters and scope/scale (summarised most recently in section 3.4.2 of INAC written intervention to the JRP, J-INAC-00024). In addition, using publicly available data from the oil-gas industry and the MGP proponents, at least two modelling exercises have shown recently that a variety of cumulative development of these oil and gas fields is highly likely (see Appendix Map 4 to

this intervention, and Pembina Institute, and Canadian Arctic Resources Committee published studies from 2005, both deposited to the JRP Public Registry: J-OREI-00011; J-CARC-0021).

In the case of the opening of the gas and oil basins in northwestern Canada – including NWT, Yukon, Nunavut, and conceivably northern Alaska (see Appendix Map 2), it is reasonable to expect that significant induced development pressures will occur in the region once a Mackenzie Valley pipeline corridor is established. There is clearly enormous energy potential in this vast hydrocarbon region, comprising mainly fossil fuels (oil, natural gas, coal, methane hydrates etc), but economic factors and engineering constraints have to this point prevented these reserves from being conveyed to markets.

In conclusion, based on all past experience in relevant situations, and all credible projections for energy supply and demand in the North American continent and beyond, it is inevitable that a basin-opening MGP gas pipeline corridor will induce very significant accelerated industrial activities in the broad region, likely for the remainder of the 21st Century.

iii. Recommended approaches to assessment of cumulative regional impacts of industrial development to 2050.

WWF recognises that many experts have wrestled with the difficulties of cumulative effects assessment under anticipated/foreseeable future developments in a given region/area. Also, WWF recognises that the JRP has issued an RFP for this work re. The MGP Hearings/EA in January 2006) and should soon receive new information and advice. However, experts in this field have provided recent reviews and discussion papers (e.g., Greig, L., Pawley, K. & P. Duinker,. 2004. Alternative Scenarios of Future Development: An Aid to Cumulative Effects Assessment. CEAA R&D Monograph Series), which point to both the importance of addressing these induced, incremental development impacts in EA, and also the difficulties in so doing. The JRP is to be congratulated for its pursuit of cutting edge advice and methods in this vital area, and for focussing its work up-front in 2006 on this via the Topic-specific General Hearings in Inuvik

Based on the experiences from the Alaskan North Slope and the NRC review, plus trends in world oil-gas prices and security of future energy supplies, plus projected energy demands and supply from alternative non-hydrocarbon sources, we believe that a minimum timeframe for assessment of cumulative impacts arising from the MGP and induced development in the region would be forty years – i.e., 2050. The NRC 2003 review in Alaska identified significant impacts and liabilities that will continue long after the planned lifespan of essential infrastructure. Therefore, in the Mackenzie situation, full consideration must obviously be given to decommissioning and removal, remediation and mitigation of impacts of all industrial infrastructures after the first 25-year project lifespan is complete.

In practice, the shifting economic drivers in the region will inevitably trigger a suite of successive hydrocarbon and other industrial development projects, each with its own projected lifespan.

The EIS and supplementary filed information from the MGP Proponents do not yet fully address the requested scale at which regional and ecoregional cumulative effects assessments of social, economic and environmental values, including VECs, should occur. A number of IRs from interveners have pointed this out, and the JRP has raised this point with the Proponents, but the materials presently at hand indicate that it has yet to be addressed comprehensively. Until this information deficiency is addressed, it is not possible to validate the MGP Proponents' conclusions regarding either effects anticipated of the MGP, or induced development, or any of the suggested mitigation measures. This is a very important and fundamental shortcoming that should be addressed as soon as possible.

The Strategic Environmental Assessment approach

WWF is a proponent for the early development of a Strategic Environmental Assessment (SEA) for the MGP and the first major opening-up of these major hydrocarbon fields in the lower Mackenzie Valley. From its experience throughout the world, WWF believes that in the context of major oil and gas development programs with multiple components, SEA can bring significant improvements beyond conducting Environmental Impact Assessments (EIAs) in isolation. This is because it considers all likely regional components of development into the long-term very early in the overall decision-making process. Some mega-projects with multiple components are now so large that they constitute "programs". These developments can drive regional development and cause possible negative impacts if they precede adequate governance frameworks. MGP would constitute such a program. (see Appended WWF review report by Leaton, J. & F. Grant-Suttie. 2005. Where are all the SEAs ?, Project Finance and Environmental Assessment of Major Oil and Gas Developments).

The use of SEA results in benefits to all parties concerned from governments to investors to local communities. A good quality SEA process informs planners, decision makers and affected public on the sustainability of strategic decisions, facilitates the search for the best alternative and ensures a democratic decision-making process. This enhances the credibility of decisions and leads to more cost- and time-effective EIA at the project level.

One of the most important industrial development sectors is oil and gas extraction and transportation, where developments typically consist of a set of integrally related projects that together constitute the extraction, refining and transportation infrastructure. Under these circumstances, the use of SEA rather then just the project-focused EIA is of considerable importance. The collection of related developments must be considered together through an SEA, not separately through a series of EIAs undertaken after major decisions have been taken. Under these circumstances, the SEA mechanism can account for cumulative impacts.

The use of SEA offers significant advantages to all parties:

- Industry and investors could enjoy greater certainty about the scope and limits of existing and future development, the identification of future risks, and the ability to demonstrate that decision-making has been transparent.

- Government could benefit from improved decision-making, a framework for more efficient subsequent decisions, and a reduction in the potential for future conflict over resource-use. SEA is a valuable tool that could assist in existing land and sea use planning objectives.

- Communities and local groups can be afforded their rights to participation in decision-making and access to information. Involvement in the full SEA process builds capacity to deal with future processes and developments which can achieve the objective of genuine involvement by local communities in shaping their future. Communities should be afforded the notion of Free Prior Informed Consultation enshrined in international law.

WWF's support for SEA is consistent with Canada's 1999 federal Cabinet Directive on the Environmental Assessment of Policy, Plan and Program Proposals (see http://www.ceaa-acee.gc.ca/013/0002/dir_e.htm), and very much in line with European Community practices now. This Canadian cabinet directive "strengthens the role of strategic environmental assessment at the strategic decision-making level." In the case of the MGP basin-opening project proposal, it is clear that many direct and indirect, past, present and future federal programs, plans and policies are significantly involved, and thus we believe that an SEA initiative is an important approach to take. The experiences in the North Sea and Barents Sea of Norwegian and British governments, industry and civil society and community groups point to the strong benefits of taking such a comprehensive regional and well-integrated approach to Environmental Assessment before proceeding with a series of individual project EIAs.

The directive describes that " the strategic environmental assessment should contribute to the development of policies, plans and programs on an equal basis with economic or social analysis: the level of effort in conducting the analysis of potential environmental effects should be commensurate with the level of anticipated environmental effects. The environmental considerations should be fully integrated into the analysis of each options developed for consideration, and the decision should incorporate the results of the strategic environmental assessment." This would also consider the potential cumulative effects of proposals.

The JRP and NEB are valid processes that incorporate many aspects of SEAs. Consistent with the government's strong commitment to sustainable develop, its support for the NWT PAS and the inclusion of local concerns into decision-making processes, Canada can adopt a leadership role through the MGP in adopting a full fledged SEA that will allow for informed and strategic choices for the future of the north.

WWF for a living planet®

4. Sustainable energy strategy for Canada, and the North American context

Given the undoubted significant benefits and adverse impacts of opening this oil-gas basin at the start of this Century, and the anticipated challenges to Canada and the world of dealing with/managing the economic, social and environmental consequences of global warming, via continuing emissions of Green House Gases (GHGs) from fossil fuel combustion/consumption, MGP decisions and the management of impacts attributable to this new hydrocarbon basin opening, should be made in the context of a well-prepared and well-balanced Canadian/North American sustainable energy strategy.

Rapidly increasing North American demand for natural gas is a reality for this Century, even without the massive expansions of Alberta's energy-intensive tarsands projects. Natural gas (and oil) reserves in as yet unexploited fields in the north will inevitably be developed.

WWF recommends strongly that planning for, and assessment of cumulative impacts from, the basin-opening MGP proposal be conducted in the context of a progressive, robust, specific, clear and effective national and/or continental sustainable energy strategy. Development of the Canadian sustainable energy strategy should be initiated immediately. This would allow proper and effective sequencing and balancing of major decisions concerning potentially conflicting public commitments and expectations, so that long-term risks would be minimised and manageable, and overall benefits maximised.

WWF for a living planet®

5. Recommended key conditions/mitigation measures

WWF presents here nine recommendations to the Joint Review Panel, in the hope that these will be captured in the final report submitted to the National Energy Board. Based on our overall purpose and experience, we believe that if these are addressed properly, a satisfactory and more secure, well-balanced future for the NWT and Canada would be achieved.

i. Sustainable environmental mgmt. framework/CEAM.

That the Cumulative Effects Assessment and Management (CEAM) Strategy and Framework, and Blueprint Actions be utilised and resourced fully, with strong engagement from industry including the MGP Proponents, to develop and implement a suite of effective mitigation measures.

Utilisation of the already existing approaches, tools and frameworks, building from the experiences in the EA and management/mitigation of impacts from the diamond mining industry in the NWT, is an obvious conditions to attach to any approvals for the MGP and subsequent phased projects in the opening of northern oil-gas basins.

ii. Land use planning.

That well-balanced, long-term land use plans be completed and approved for the Sahtu and Dehcho regions in the NWT prior to any major decisions on the MGP, or associated development projects affecting these regions.

This would extend the already completed land use plans in the Inuvialuit and Gwich'in regions, and reflect the wishes of the majority of northerners, thereby helping ensure that sufficient net long-term benefits do flow significantly to northern communities.

iii. Sequencing conservation measures and industrial allocations.

That in order to satisfactorily meet conservation commitments made in the NWT, especially in the 16 ecoregions directly or indirectly intersected by the proposed MGP pipeline, no new allocations to industrial exploration or development access be granted until habitat conservation measures such as the interim protection of a network of culturally and ecologically significant areas (essentially VECs using the EIS terminology) be completed.

WWF believes that only by sequencing decisions in this way can 'sustainability' commitments and approaches be truly honoured and achieved, for the overall benefit of future generations.

for a living planet®

iv. Full implementation of NWT PAS Action Plan to 2010.

That the five-year NWT Protected Areas Strategy (PAS) Action Plan be fully implemented by 2010, meeting commitments made by all PAS partners and the federal and territorial government responsible Ministers to reserve an adequate and representative network of special cultural and ecological areas in the 16 Mackenzie Valley ecoregions identified by the Action Plan and recognised by the Joint Review Panel and other key government agencies.

Key areas of High Conservation Value (cultural and ecological/watershed values mainly), or VECs, in the 16 ecoregions can be clearly identified and reserved, thereby bringing much-sought certainty overall to communities, potential developers, investors, and the general public alike.

v. Benchmark reference areas for impacts monitoring/mitigation.

That an adequate network of large natural areas free from regional/local industrial activity and impacts be available as benchmark reference areas in comparable ecoregions, from which to satisfactorily monitor and assess any environmental impacts attributed to the MGP pipeline and future induced industrial activity.

Only in this way can future mitigation measures be efficiently assessed and then prioritised to address identified stress factors.

vi. Ecosystem adaptation measures re. rapid climate change, and incremental industrialisation.

That a robust network of protected areas be established as anchor areas of high conservation value before any further industrial allocations or major decisions are made, in order that ecosystem resilience to the stresses and uncertainties resulting from rapid climatic change be maximised.

Safeguarding an adequate and representative network of special cultural and ecological natural areas free from stresses resulting from regional industrial development is now widely acknowledged by experts to be one key mechanism within an effective climate change adaptation strategy, consistent with both the UN Framework Convention on Climate Change, and the Canadian Government's Framework for Climate Change Adaptation.

Given the extent to which traditional northern diets, and fundamental cultural characteristics are dependent on subsistence hunting, the health of wildlife populations forming substantial parts of the 'country food' is critical. Species such as caribou, moose, anadromous fish, some aquatic birds, etc are already susceptible to the impacts of climate change as well as other stressors. Thus, providing an adequate network of key protected habitats for these wide-ranging species, connected via sound conservation/land use planning mechanisms, is vital to ensuring the future sustainability of such harvesting and human dependence on these species populations.

vii. Environmental monitoring and infrastructure clean-up.

That a well-resourced and sustained, transparent environmental monitoring regime be put in place upon any MGP approvals, along with sufficient posted bonds from the MGP Proponents and subsequently induced development projects in the region, to ensure that ecosystem impacts are both detected and then promptly and satisfactorily addressed by development project partners, and not by the general public at some later date.

viii. Strategic Environmental Assessment.

That the federal government integrate into the NEB, JRP and Board approvals processes for the Mackenzie Valley a full Strategic Environmental Assessment approach before finalising any approvals of the basin-opening MGP, consistent with the 1999 cabinet directive on SEA.

In this way, the full regional industrial development, socio-economic and cumulative environmental effects issues can be properly addressed by society ahead of ad hoc individual project-based EIAs and decision-making. Regional land use and community plans are important, but must be integrated at a sufficiently broad regional scale consistent with that at which ecosystems function and at which regional hydrocarbon developments will occur.

ix. Sustainable energy strategy for Canada/North America.

That a final public interest decision be made on the basin-opening MGP proposal in the context of a progressive, robust, specific, clear and effective national and/or continental sustainable energy strategy. Development of the Canadian sustainable energy strategy should be initiated immediately.

This would allow proper and effective sequencing and balancing of major decisions concerning potentially conflicting public commitments and expectations in the broader context, both within and beyond the Mackenzie River Basin. Rapidly increasing North American demand for natural gas is a reality for this Century, even without the massive expansions of Alberta's energy-intensive tarsands projects. Natural gas (and oil) reserves in as yet unexploited fields in the north will inevitably be developed.

WWF for a living planet®

6. Conclusions

WWF believes that the work of the Joint Review Panel in assessing the anticipated impacts of this basin-opening MGP proposal is central to Canada being able to build a well-balanced future for northerners and the ecosystems upon which we all depend.

Based on WWF's experience on similar 'frontier' hydrocarbon development projects around the world, it is clear that if constructed the MGP will quickly induce accelerating industrial activity in the broader region that will probably continue for the rest of this Century. There will be many positive impacts from this cumulative development, but also some significant adverse impacts.

The successful management and mitigation of impacts is WWF's overall concern in intervening here. WWF strongly supports the wishes of many northerners today that they derive benefits from proceeding with economic development, but not at any cost. Canada clearly has the tools with which to achieve this, but all must be used.

With proper prior planning, correct sequencing of conservation measures and industrial activity, and comprehensive cutting-edge approaches to environmental assessment through both cumulative effects assessment, and regional strategic environmental assessment (SEA), we believe that Canada can and should leave this Mackenzie case as a progressive 21st Century model for others to use in similar situations elsewhere.

In order to succeed with a new, well-planned and long-term visionary approach, WWF makes nine recommendations to the Joint Review Panel, in the hope that these will be helpful in your work over the coming months, and in completing your report to the National Energy Board. Ultimately we hope that the final decisions to be made in the broader public interest will reflect the full and long-term spectrum of costs and benefits, in order that our descendents do not inherit an unnecessarily risky and unmanageable future.

WWF for a living planet®

7. Appendices

Key Maps:

1. Spatial changes in industrial development and associated infrastructure in the Prudhoe Bay region of N Alaska since 1968 (based on maps from NRC 2003 report, and various US federal and State govt. departments).

2. Estimated Natural Gas potential in key basins in northern Alaska and Canada (adapted from maps of Canadian Gas Potential Committee, and USGS national oil and gas assessment).

3. 21st Century Climate Change sensitivity maps for Canada (based on National Atlas of Canada data):
   a. Tarnocai, C., I.M. Kettles. and B. Lacelle. 2000. *Peatlands of Canada Map.* Geological Survey of Canada, Open File 3834. Scale 1: 6 500 000. Ottawa: Natural Resources Canada. Online at: http://atlas.gc.ca/site/english/maps/climatechange/potentialimpacts/sensitivitypeatlands

   b. Ashmore, P. and M. Church. 2001. *The Impact of Climate Change on Rivers and River Processes in Canada.* Geological Survey of Canada Bulletin 555. Ottawa: Natural Resources Canada.. Online at: http://atlas.gc.ca/site/english/maps/climatechange/potentialimpacts/sensitivityriverregions

4. Regional cumulative development scenario to 2059 in parts of the NWT Mackenzie Valley (based on data provided to NEB by MGP intervenors and consultants, and illustrated in Map #10 of the 2005 report of the Canadian Arctic Resources Committee).

5. Mackenzie Valley NWT PAS Action Plan 16 ecoregions directly intersected by the proposed MGP and associated infrastructures.

6. High Conservation Value area maps for the focal 16 NWT ecoregions:
   a) EIS maps (Fig. 7-1 in MGP Supplementary Information filed by the Proponents),
   b) NWT PAS (Goal 1 and Goal 2) and HCV bio-cultural areas.

WWF for a living planet®

<u>Key documents</u> (e-attachments on 15 CDs provided to JRP in advance):

1. NWT PAS Action Plan 2004-9.
   (see: Govt. of NWT website at: http://www.nwtwildlife.rwed.gov.nt.ca/pas/index.htm)

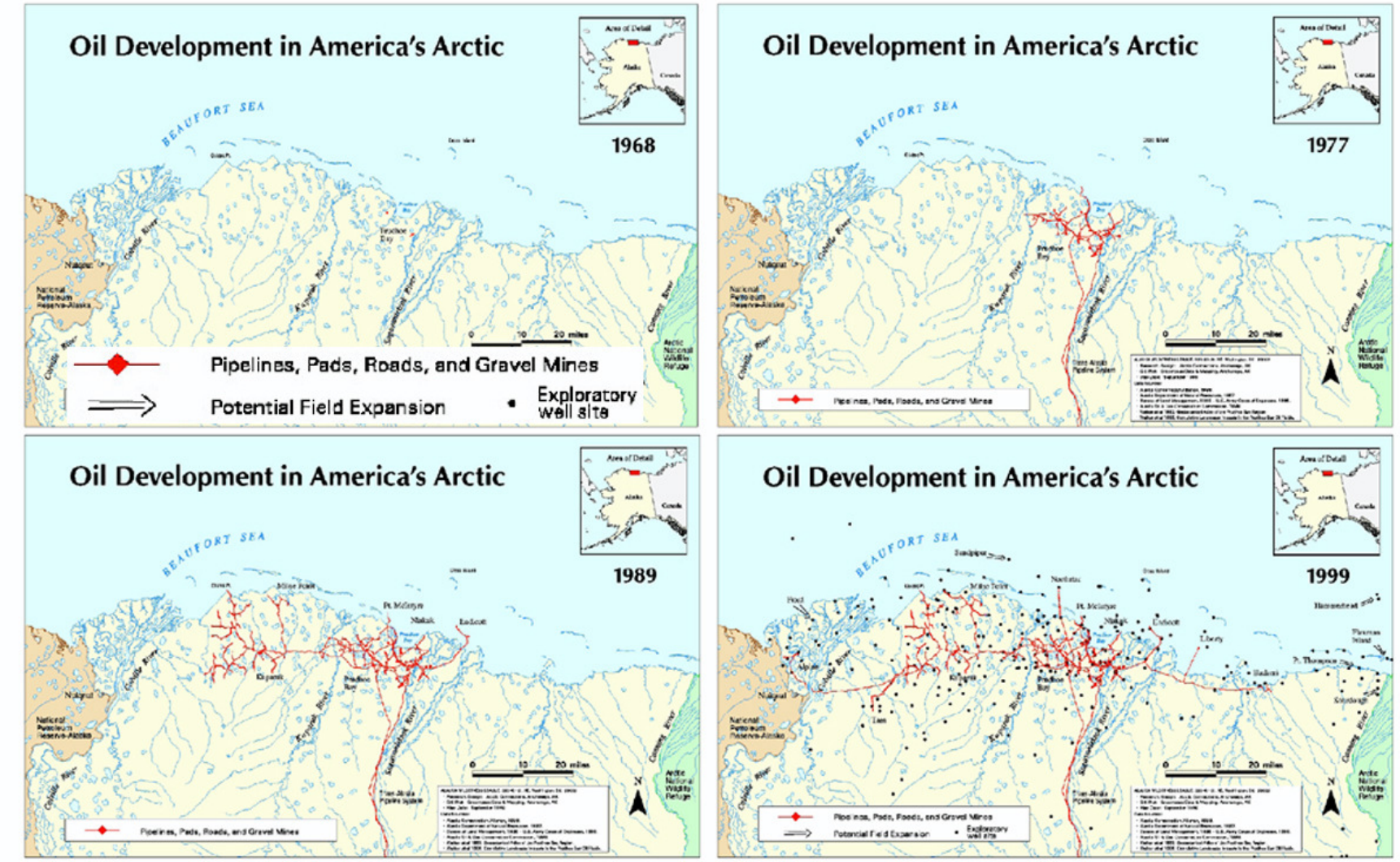
2. WWF comments on draft Terms of Reference for MGP EIS (from July 2004). (attached here as an e-attachment, and on the JRP Public Registry).

3. WWF main points for JRP June 2005 Conference on Information Sufficiency (e-attachment here, and on the JRP Public Registry).

4. WWF published review paper 2005. "Where are all the SEAs? Project Finance and Environmental Assessment of Major Oil and Gas Developments. " (Leaton J. & Grant-Suttie, F., Jan 2005. WWF-UK, Godalming, Surrey).

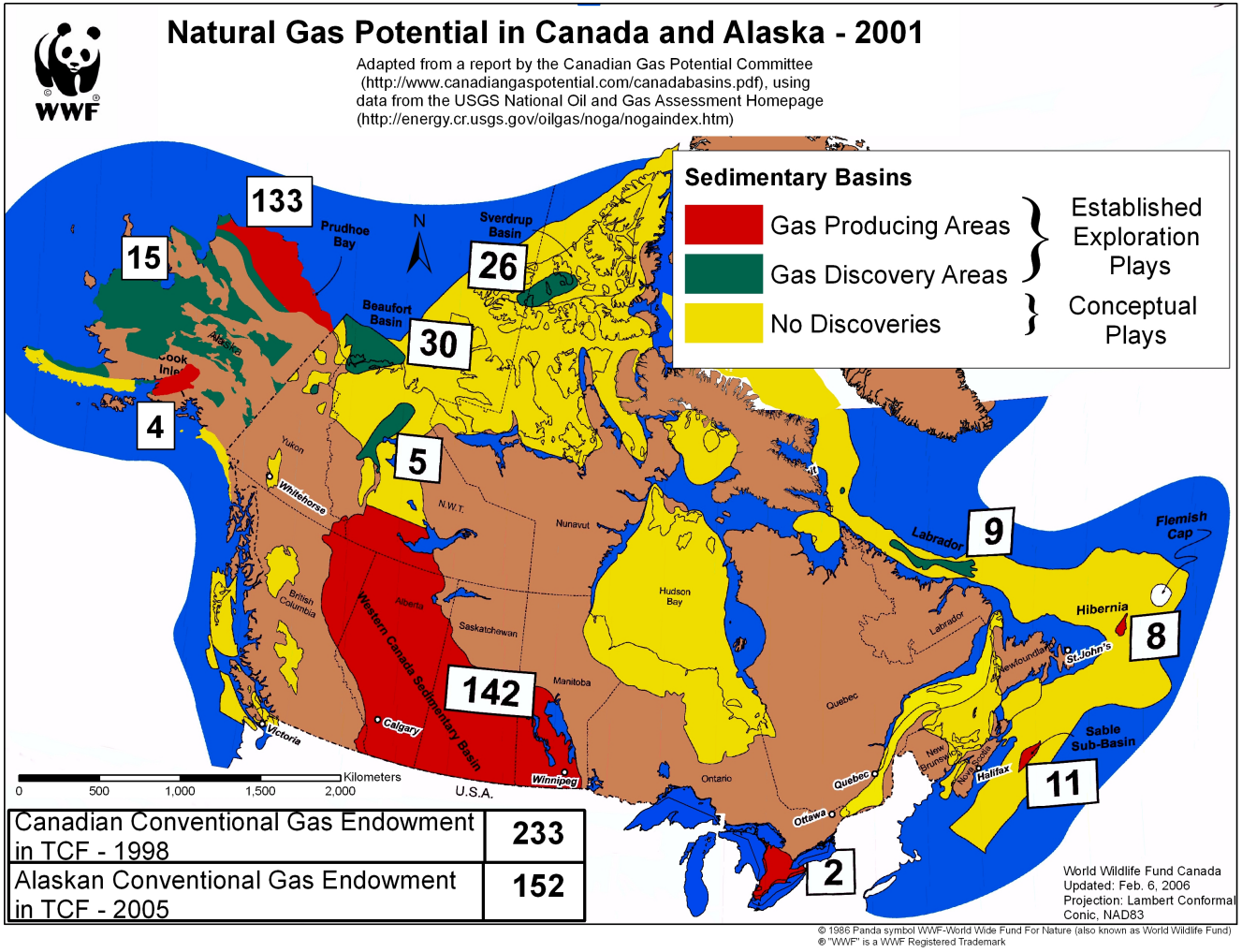
5. Goodland, R. 2005. Oil and Gas Pipelines: Social and Environmental Impact Assessment: State of the Art. International Association of Impact Assessment. http://www.iaia.org

Map 1. Spatial changes in industrial development and associated infrastructure in the Prudhoe Bay region of N Alaska since 1968.

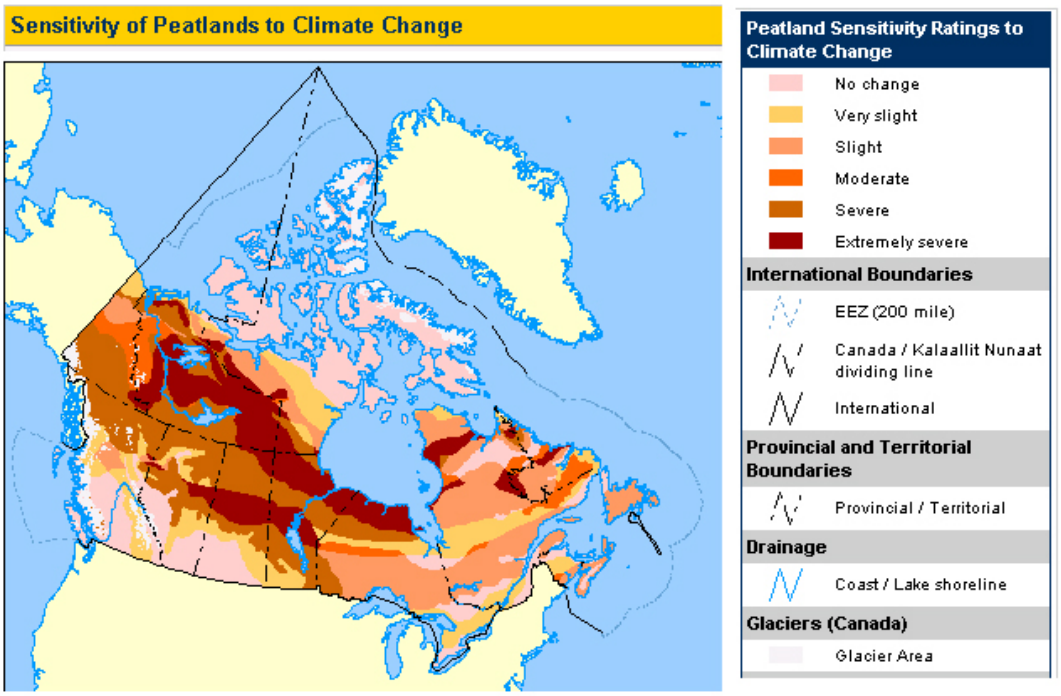


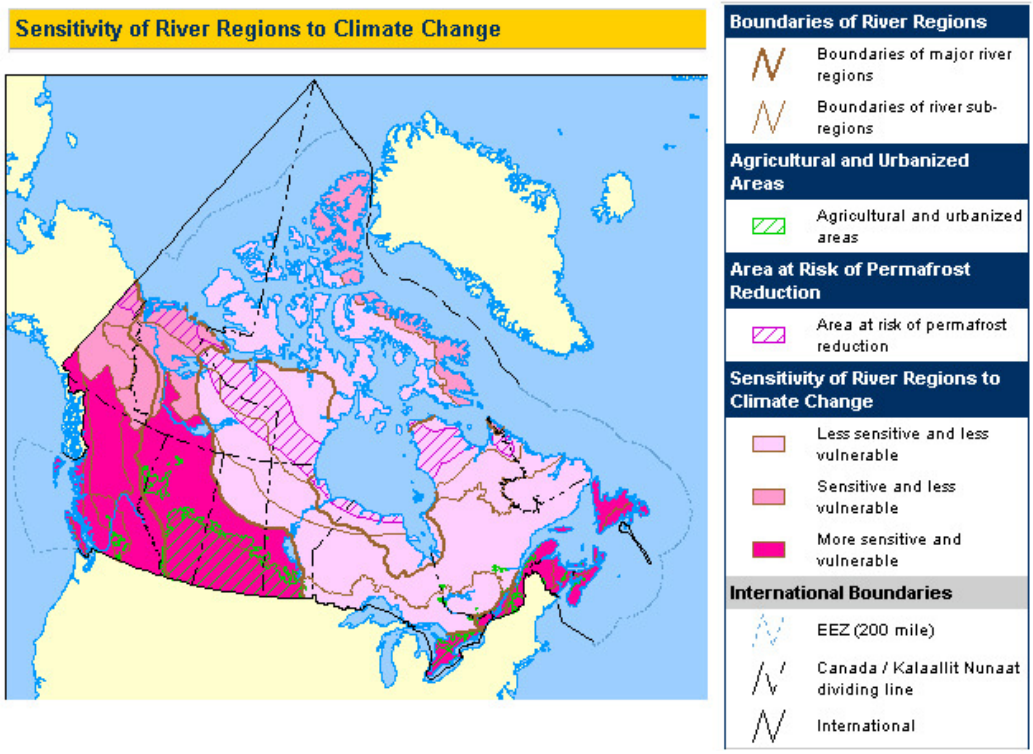
WWF for a living planet®

Map 2. Estimated Natural Gas potential in key basins in northern Alaska and Canada

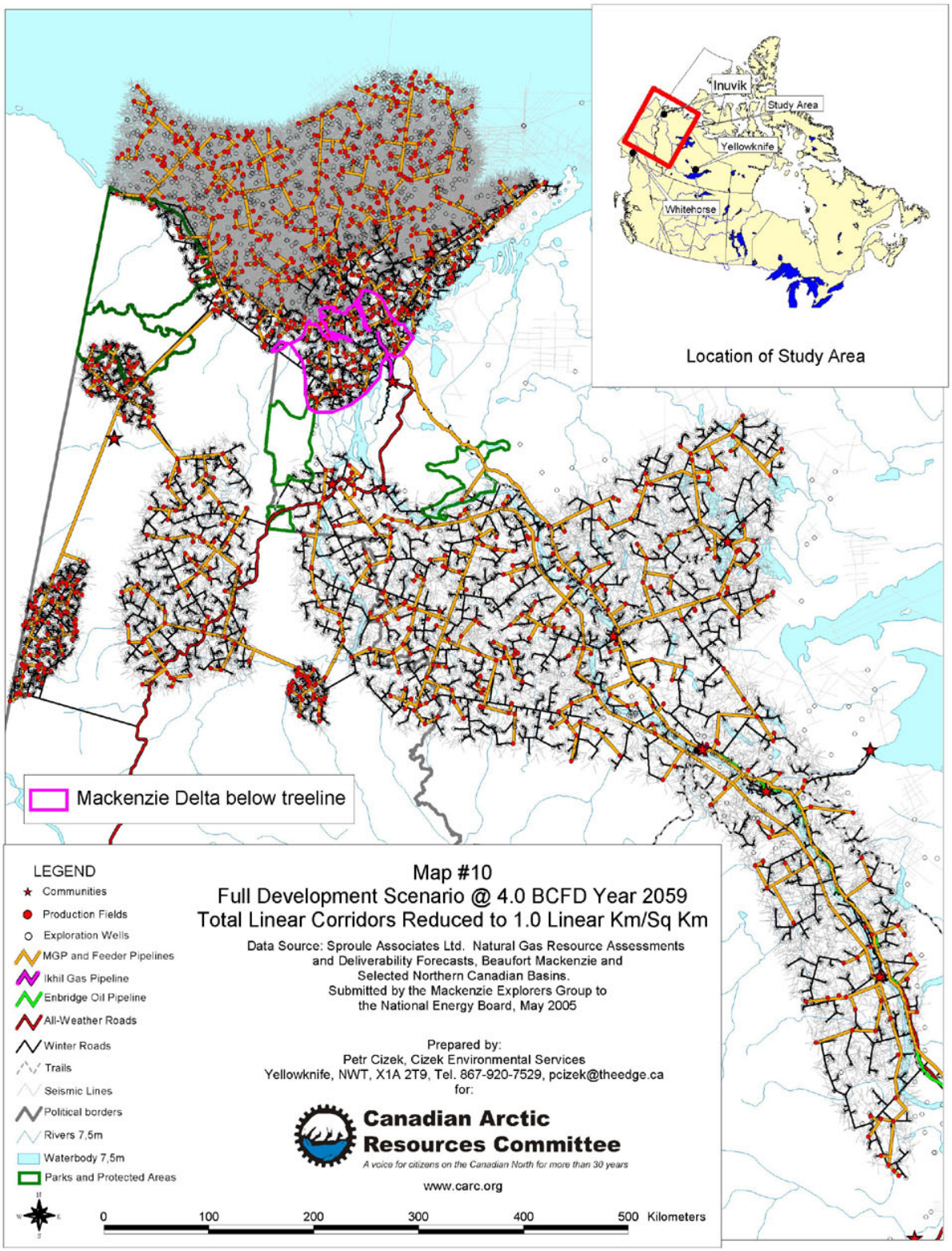


Map 3. 21st Century Climate Change sensitivity maps for Canada



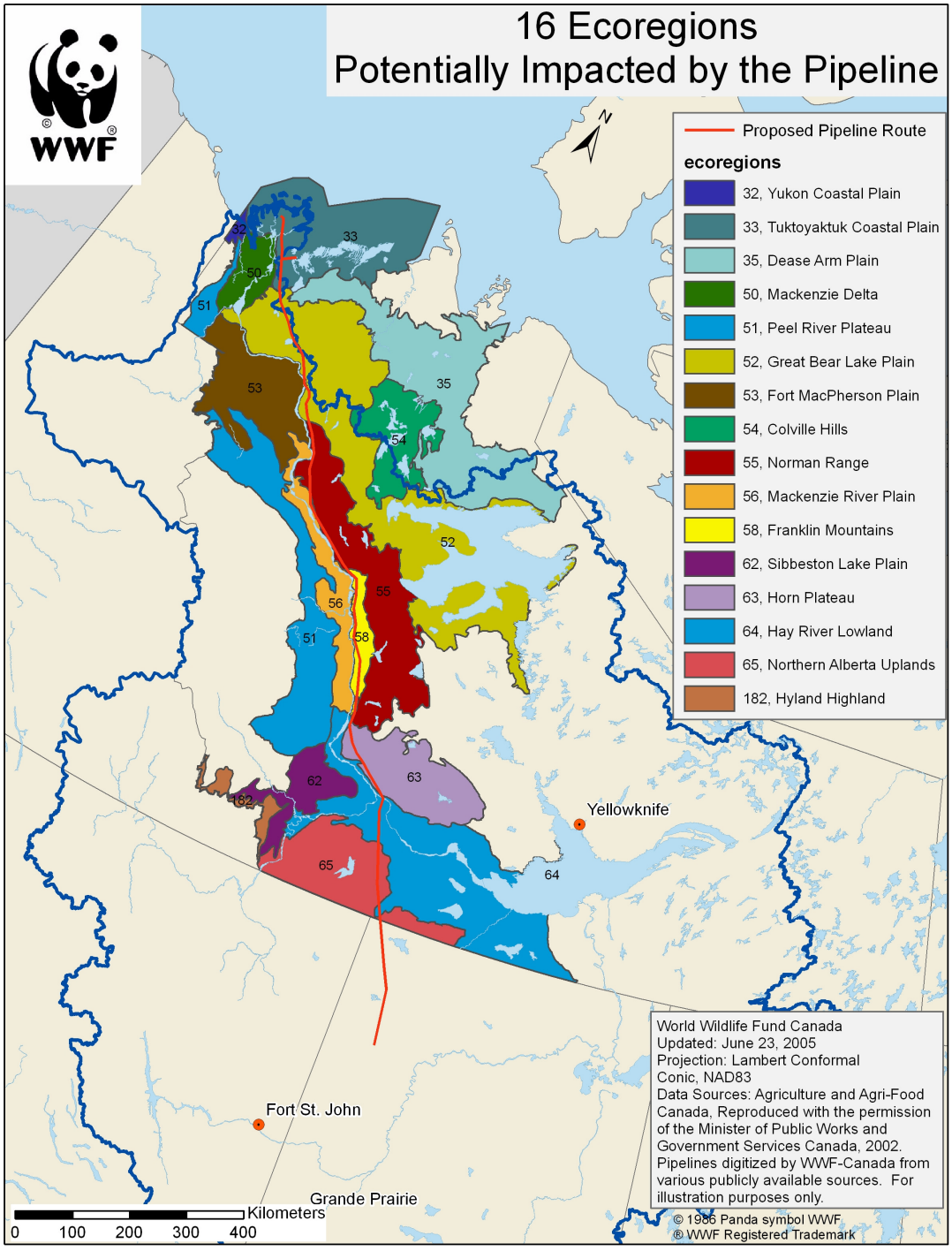


Map 4. Regional cumulative development scenario to 2059 in parts of the NWT Mackenzie Valley (based on data provided to NEB by MGP intervenors and consultants, and illustrated in Map #10 of the 2005 report of the Canadian Arctic Resources Committee).



WWF for a living planet®

Map 5. Mackenzie Valley NWT PAS Action Plan 16 ecoregions directly intersected by the proposed MGP and associated infrastructures.



Map 6. High Conservation Value area maps for the focal 16 NWT ecoregions: a = EIS Supplementary; b = WWF/NWT PAS.

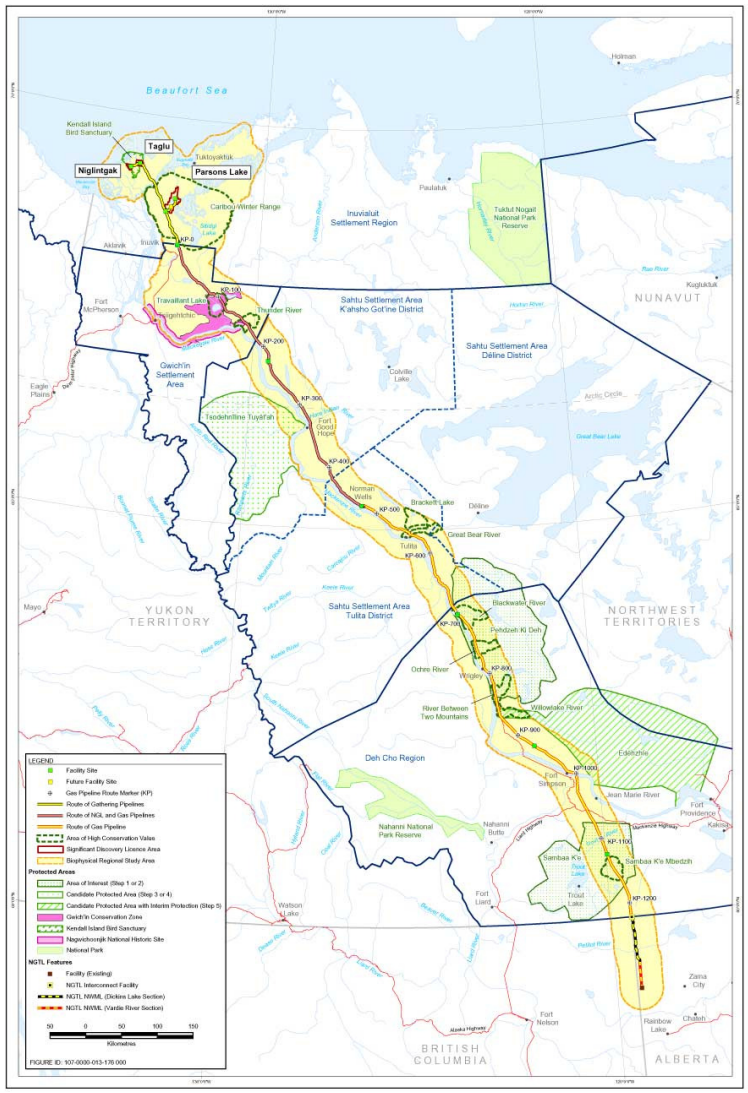


Figure 7-1: High Conservation Value Areas and Protected Areas