2002

COMPENDIUM OF RESEARCH IN THE NORTHWEST TERRITORIES

Including:

- Scientific Licences
- Archaeological Permits
- Wildlife Permits and
- Fisheries Permits

Aurora Research Institute
Aurora College

ABOUT THE AURORA RESEARCH INSTITUTE

The Aurora Research Institute (ARI) was established in 1995 as a division of Aurora College when the Science Institute of the Northwest Territories (NWT) divided into eastern (Nunavut) and western (NWT) divisions.

The Aurora Research Institute's mandate is to improve the quality of life for NWT residents by applying scientific, technological and indigenous knowledge to solve northern problems and advance social and economic goals.

ARI is responsible for:

- licensing and coordinating research in accordance with the NWT *Scientists Act:* This covers all disciplines including the physical, social, biological sciences and traditional knowledge;
- promoting communication between researchers and the people of the communities in which they work;
- promoting public awareness of the importance of science, technology and indigenous knowledge;
- fostering a scientific community within the NWT which recognizes and uses the traditional knowledge of northern aboriginal people;
- making scientific and indigenous knowledge available to the people of the NWT;
- supporting or conducting research and technological developments which contribute to the social, cultural and economic prosperity of the people of the NWT

To learn more about ARI, you can contact us at:

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FOREWORD

The Aurora Research Institute (ARI) is responsible for compiling the annual Compendium of Research in an effort to keep northerners informed of research activities in the Northwest Territories. The licensing requirement for researchers in the Northwest Territories is a provision of the Scientists Act of the NWT, ensuring that an annual summary of their work is accessible to all those who need to be informed and others who may be interested in these activities. The sharing of this information allows for greater involvement of northerners in the development of research programs that are pertinent to the needs of the North. This information also enables researchers to work collaboratively on related issues.

Industrial development in the NWT in recent years has highlighted the need for scientific and technological knowledge. The critical role that research plays in guiding public policy is increasingly recognized by the people, the governing agencies and the private sector of the Northwest Territories. Training in these areas is critical to allow for adaptation to the rapidly changing social and economic structure of the North. ARI actively promotes partnership with community groups, government agencies, and private sector organizations in order to identify research needs and strategies to meet those needs. Researchers are also partners in these endeavours.

Through the research licensing and permitting requirements, aboriginal organizations and community groups have input into the research that is conducted and are kept informed of current and proposed research in their region. ARI, in cooperation with researchers, assists in training community members to participate in research projects within and outside their communities.

Researchers make a valuable contribution to the North as they provide information and education through schools and community presentations, and they also provide employment and training opportunities. There are an increasing number of partnerships and cooperative programs being developed with researchers and the people of the North. By sharing this information, the people of the North are able to help in sharing the future direction of research in this region.

Aurora Research Institute works to connect scientists with the communities of the Northwest Territories by promoting and supporting studies which improve the understanding of the natural resources and indigenous knowledge and cultures of the NWT. The Compendium of Research is one means by which scientific and traditional knowledge is made available to people of the NWT.

Andrew Applejohn
Director
Aurora Research Institute

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ABOUT THIS BOOK

The Compendium of Research in the Northwest Territories is a summary of research licences/permits that were issued in the Northwest Territories during 2002. The information contained in this book is a collaboration between the Aurora Research Institute (ARI), the Prince of Wales Northern Heritage Centre (PWNHC), the Department of Resources, Wildlife, and Economic Development (RWED) and the Department of Fisheries and Oceans (DFO). The Compendium series began in 1986.

Licensing in the NWT

Under territorial legislation, all research in the NWT requires a licence/permit from one of three agencies, depending on the type of research being conducted:

- Prince of Wales Northern Heritage Centre — Archaeology
- Department of Resources, Wildlife, and Economic Development, Government of the Northwest Territories — Wildlife
- Aurora Research Institute — All other research in the NWT

Included in this Compendium are Fisheries Research projects conducted by the Department of Fisheries and Oceans staff. Other researchers conducting fisheries research are required to have a Science Licence and are included in this section of the Compendium. In addition to one of these licences/permits there may be other permits required depending on the nature of the research work.

Through the licensing process, researchers are informed of appropriate organizations, communities and other licensing/permitting agencies that should be contacted prior to conducting studies. Licensing ensures research activities are communicated to interested parties and provides opportunities for the exchange of information.

Although the Compendium is a summary of all licences/permits issued in the NWT by all three licensing/permitting bodies, it is not a list of actual research conducted. The reader is encouraged to contact the researcher for further verification and additional information.

HOW TO USE THIS BOOK

This book has four main sections. Each of these sections reflects a specific licensing agency and type of licence/permit issued. Within each section research descriptions have been grouped by subject, and listed alphanumerically by the principal researcher's last name. Refer to the Table of Contents for the specific page on which each section and/or subject begins.

1. Reference Number

The reference numbers shown in each of the Aurora Research Institute's subject areas refer to the file number issued to a particular researcher. It allows cross referencing with research material that may be available on file or in the ARI library. The reference numbers of the other two agencies refers directly to the permit numbers given to each researcher. When requesting information from any of these agencies on specific research outlined in this compendium, please refer to the reference number in your correspondence.

2. Regional Abbreviations

Throughout the book reference is given to the specific land claim region(s) in which the research took place. The regions are shown in Figure 1. Some of the land claim regions are still under negotiation and boundaries shown are only approximations. The abbreviations shown for each region are as follows:

DC	Deh Cho	**SS**	South Slave
NS	North Slave	**SA**	Sahtu
IN	Inuvik (includes Gwich'in and Inuvialuit Settlement Regions)		

3. Glossary

A glossary of terms has been added to the Compendium. The intent of the glossary is to allow the reader to better appreciate the research descriptions.

4. Index

At the back of this book, you will find two indices. These have been developed to help the reader cross reference material more easily. The numbers used in the Researcher Index refer to the number listed with each research description. The numbers listed in the Subject Index refer to the page numbers.

AVAILABLE IN PRINT OR CD

The Compendium is available as a printed publication or digitally on CD. The Compendium can be downloaded from the Aurora Research Institute's website (www.nwtresearch.com) or a copy can be requested by contacting the Aurora Research Institute. We encourage photocopying of the printed publication to promote its distribution.

FOR MORE INFORMATION ABOUT THE RESEARCH LISTED IN THIS BOOK

Please contact:

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SEND US YOUR COMMENTS

Whether you are a researcher or an interested member of the public, the Aurora Research Institute welcomes your comments and suggestions about the Compendium. Contact us by mail, fax, email or telephone (see address above).

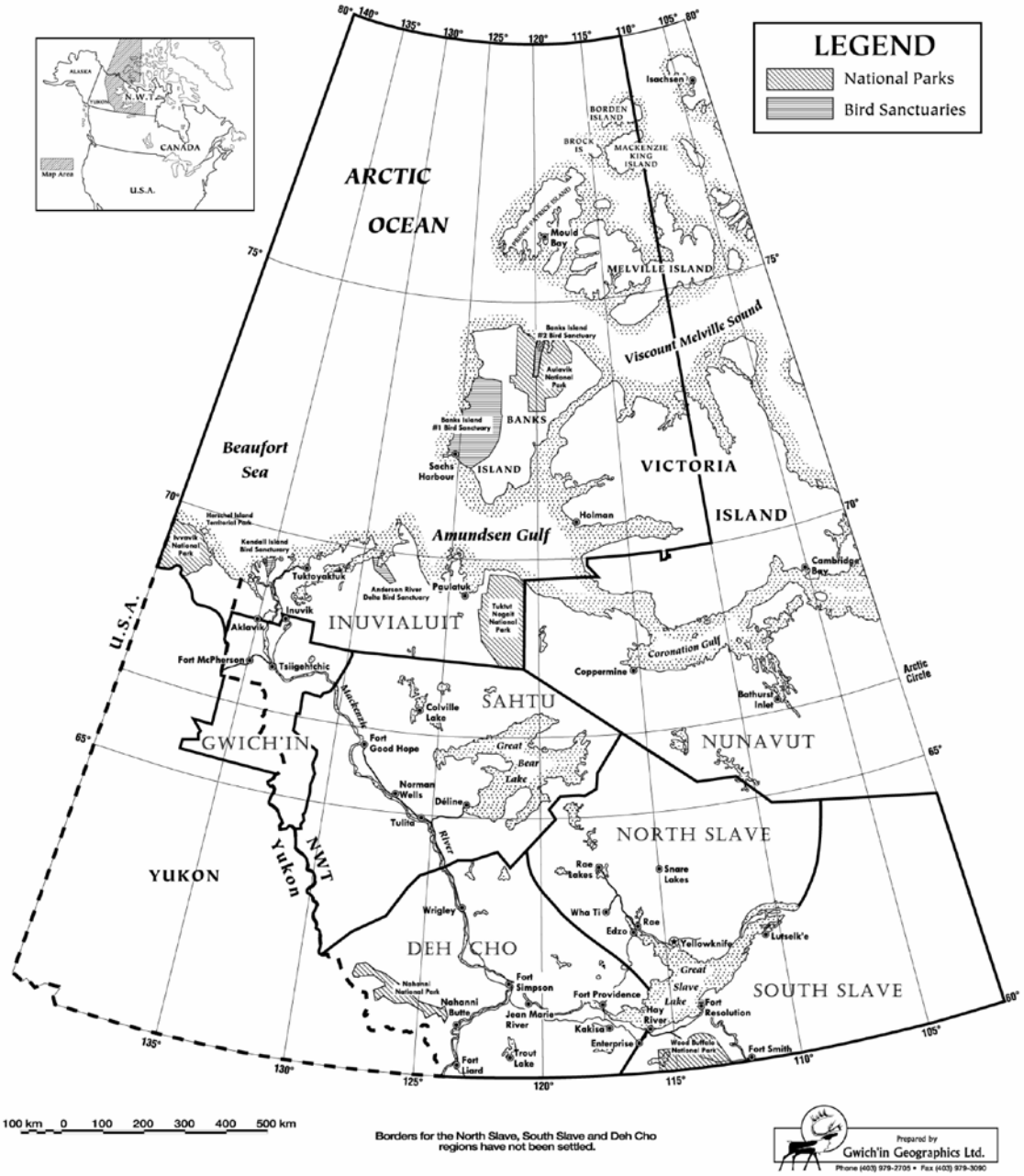

Figure 1: Land Claim Regions in the Northwest Territories

Aurora Research Institute
Science Licences

BIOLOGY

001 **Biology**

Chubb, Derek
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derek.c.chubb@bhpbilliton.com

File No.: 12 402 676
Region: NS **Location:** Beartooth Lake, Ekati Diamond Mine

2002 Beartooth Lake Fish-Out Program

The objective of this study was to remove all fish from Beartooth Lake prior to dewatering and in a manner which respects community concerns raised in previous public stakeholder meetings. This study; 1) quantified fish production, fish habitat, and productivity of intermediate trophic levels; 2) established relationships between habitat and productivity; 3) established a reference data base for lake comparisons; and 4) verified sampling program data on fish abundance and community structure. It was anticipated the fish-out would involve the removal of arctic grayling, lake trout, slimy sculpin, lake chubb, round whitefish and burbot. The fish-out was done in accordance with the established Department of Fisheries and Oceans fish-out protocols to ensure minimal impacts.

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002 **Biology**

Chubb, Derek
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File No. 12 402 676
Region: NS **Location:** Sable and Two Rock Lakes, Ekati Diamond Mine

Sable and Two Rock Lake Fish-Out

This project was to meet the requirements of the Department of Fisheries and Oceans (DFO). Sable and Two Rock Lakes will be lost through the course of mining activities. The scientific collection of data related to the fish population prior to their removal was identified as an important activity. The objective of the fish-out program was to provide scientific data to quantify fish production and fish habitat. The result of the program is the removal of all fish in Sable and Two Rock Lakes. Permanent survey sites were established in the deepest portions of each basin and three sampling surveys were conducted at each site to gather aquatic biology and physical limnology data. Once the lakes were sufficiently dewatered, fish were primarily trapped using gill nets of a variety of mesh sizes and with trap nets. Innovative capture methods, with prior approval by DFO, were attempted to complete total removal. Fish population counts and fish biological data were collected. Fish suitable for human consumption were returned to Aboriginal communities. Fish unsuitable for human consumption were provided to dog teams in Yellowknife. Habitat mapping took place primarily after the lakes had been dewatered and physical habitat exposed. GIS data was collected using low level photogrammetric aerial photography by helicopter, on-site classifications, and GPS.

003 **Biology**

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File No.:12 402 640
Region: SS **Location:** 350 km west to east transect along the Thelon River from its confluence with the Clarke River (NWT) to Beverly Lake (Nunavut)

Insect Biodiversity and Biogeography along the Thelon River

The black flies of the Thelon River were surveyed from June 29 to July 5, 2002. Samples were taken along the Thelon valley from its junction with the Hanbury River, to the point at which the river entered Nunavut. Morphological and chromosonal examination of approximately 4,700 specimens yielded 29 species, matching closely the total number of species (30) collected from along the Horton River in 2000. However, only about half of the species (17) are shared between the two drainages. These results suggest that simuliid community structure is complex across northern Canada. Collectively, the Horton and Thelon expeditions yielded a total of 42 black fly species - far exceeding the 22 species recorded previously from arctic Canada east of the Mackenzie River. The 29 species collected from the Thelon Wildlife Sanctuary were divided among 8 genera as follows: *Gymnopais* (1), *Helodon* (1), *Prosimulium* (1), *Greniera* (1), *Stegopterna* (2), *Cnephia* (1), *Metacnephia* (3) and *Simulium* s.l. (19). At least one species, a member of the *Simulium arcticum* complex, is new to science. Another species, a member of the *Simulium* subgenus *Hellichiella*, was previously known only from a single locality in Norway.

004 **Biology**

Eschenroder, Randy L.
Great Lakes Fishery Commission
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Anne Arbor, MI 48105

Reference Number: 12 402 679
Region: SS **Location:** Great Slave Lake near Lutsel K'e

Morphological Diversity in Lake Trout within Large North American Lakes: Effects of Lake Physiography on Differentiation between Deep and Shallow Forms

The long-term objective of this research in Great Slave Lake is to determine the abundance, distribution, and ecology of deepwater lake trout. The immediate objective in 2002 was to collect at least 35 each of the deepwater and shallow-water types (the type commonly taken in fisheries) of lake trout to provide enough specimens to scientifically discriminate between them. In addition, the researchers wanted to gather preliminary information on how the two types shared the lake. Nine gillnet sets were made in the East Arm, mainly in the vicinity of Pearson Point, at depths ranging from 106 to 399 feet (32 m to 122 m) and captured 106 trout of which seven larger fish were released alive. Deepwater lake trout had shorter heads and bodies but were deeper bodied than the common lake trout. Deepwater lake trout were also more vividly coloured, especially in red and gold hues. No deepwater trout were captured at depths greater than 300 feet (91 m), although this fish appears to inhabit deeper water than the common trout of Great Slave Lake.

005 **Biology**

Evans, Kevin
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Reference Number: 12 402 673
Region: IN **Location:** across the existing offshore Devon lease areas in the Inuvialuit Settlement Region

Devon Canada Corporation – Marine Birds Study for the Proposed Beaufort Sea Offshore Drilling Program

Aerial and ground-based surveys for waterbirds were conducted to gather information for use in the development of a Comprehensive Study Report and regulatory submissions for Devon Canada's Beaufort Sea offshore oil and gas exploratory drilling program. The coastal and nearshore areas of the Beaufort Sea are known to be used by large numbers of marine and shoreline birds during their spring and autumn migrations. The surveys took place along transects in EL 420 and along the shoreline from Phillips Bay, Yukon to McKinley Bay and the Tuktoyaktuk Peninsula, Northwest Territories during four periods between June and Septmeber. At ground-truthing sites, observers used a spotting scope for counting and identifying waterfowl. All water birds were identified by species, age, and gender, when possible, and counted. About 75,000 individual birds were sighted, and more than 50 species recorded. Waterfowl accounted for almost 88% of those individuals. The next most abundant group of sea-associated birds were gulls (approximately 8.2%), while shorebirds and loons accounted for most of the balance. In terms of the overall abundance of waterfowl, almost half were recorded along the Tuktoyaktuk Peninsula, followed by the Western Lease Area, Eastern Lease Area, and Yukon, demonstrating the comparative importance of the Tuktoyaktuk Peninsula.

006 **Biology**

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Reference Number: 12 402 673
Region: IN **Location:** across the existing offshore Devon lease areas in the Inuvialuit Settlement Region

Devon Canada Corporation – Marine Mammals Study for the Proposed Beaufort Sea Offshore Drilling Program

A literature review and aerial surveys were conducted to gather information about marine mammals for use in the development of a Comprehensive Study Report and regulatory submissions for Devon Canada's Beaufort Sea offshore oil and gas exploratory drilling program. The available literature indicates that the distribution, abundance and migratory patterns of the five marine mammal species commonly found in the southern Canadian Beaufort Sea (bearded seals, beluga whales, bowhead whales, ringed seals and polar bears) are generally well known. Only ringed seals and polar bears are typically found in the land fast ice zone during the winter months when drilling operations are planned to occur. Aerial surveys were conducted to document marine mammal distribution and movements in and near EL 420. Observers recorded sightings of 206 individual beluga whales and 2 ringed seals; no bowhead whales, bearded seals or polar bears were sighted. There were also numerous incidental sightings of marine mammals during water bird surveys flown in EL 420. Beluga whales were recorded each month, with peak sighting rates in July. Ringed seals were also sighted in late June and mid July. Small numbers of bearded seals were recorded during June and July, and there was a single sighting of a polar bear in September.

007 **Biology**

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Reference Number: 12 402 673
Region: IN **Location:** within the Inuvialuit Settlement Region and across the existing offshore Devon lease areas

Devon Canada Corporation – Fish, Plankton and Benthic Communities Study for the Proposed Beaufort Sea Offshore Drilling Program

A review of literature on fish and invertebrate communities and a field survey were conducted to gather information for use in the development of a Comprehensive Study Report and regulatory submissions for Devon Canada's Beaufort Sea offshore oil and gas exploratory drilling program. Published information pertaining to the nearshore area extending from Herschel Island to the northeastern tip of the Tuktoyaktuk Peninsula, encompassing EL 420, was collected in regard to: fish populations; life histories and habitat use; commercial and subsistence fisheries; and benthic invertebrate and plankton populations and habitat use. The field surveys focused on seven drill targets within the lease area. The surveys were conducted from the Canadian Coast Guard Vessel Sir Wilfrid Laurier. The occurrence of fish species was documented and the composition and abundance of invertebrates were determined at each drill target site. Additional sites nearby were also sampled to provide a more complete description of the nearshore aquatic environment. Surveys conducted included: gill netting; beach seining; bottom sediment grabs; subsurface net tows; Isaacs-Kidd trawls; water temperature and salinity; and collection of Arctic cod from pools on the ice floe. There are seven species of fish in the survey area of particular importance to local harvesters: broad whitefish; lake whitefish; Pacific herring; inconnu; Dolly Varden; Arctic cisco and least cisco. Although the area apparently supports no spawning areas for these species, rearing habitats for some or all of these species may include coastal portions of the lease areas.

008 **Biology**

Ferguson, Gordon
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Reference Number: 12 402 674
Region: DC **Location**: along the Liard pipeline south of Fort Liard

Post Construction Water Quality Monitoring and Pipeline Monitoring for the Liard Pipeline and Gathering Project, Fort Liard, NT and Maxhamish Area, BC

In July 2002, field crews assessed the progress of revegetation by natural means and issues related to soil on the Liard pipeline as well as water quality in the creeks crossed by the Liard pipeline and access road. Revegetation success was evaluated using 8 transects extending across the pipeline right-of-way. Erosion concerns and overall revegetation success was assessed by flying the pipeline right-of-way in a helicopter and recording the representative areas and taking pictures. Water quality was evaluated by taking water samples and sending them to the lab for analysis. The results of the monitoring surveys indicated that natural revegetation of native vegetation along the pipeline right-of-way is proceeding. No concerns were detected in the water quality monitoring survey that would be attributed to pipeline operations. Some erosion issues were identified and will be addressed this winter. The monitoring of revegetation, soil and water quality is ongoing and is scheduled to continue in the summers of 2003 and 2004.

009 **Biology**

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Reference Number: 12 402 677
Region: Location: Lynx Creek, Shell Lake

Dispersal of White Spruce Seeds and Pollen/Understory Scarification in a Mast Year

The long distance dispersal of tree pollen and seeds is of considerable interest as we ask how fast plants can migrate in response to rapid climate change. Nonetheless, there are no useful data sets on long distance dispersal primarily because it is almost impossible to find well-isolated patches of source trees. The Inuvik area is a likely place because so many boreal species reach their range limit there as a set of discontinuous small populations. The researcher focused on white spruce. Examination of seed dispersal was based upon looking at germinants in raked plots. As this raking occurred during a mast year of white spruce, this provided an opportunity to examine a cost effective approach for regenerating spruce. Pollen dispersal was examined via sampling a very large number of Vaseline covered plastic strips in the delta and adjacent part of the mainland. The research team tried to trap pollen grains as far away as 1 km from any source tree. In addition to the natural seed fall on the raked plots, the researcher also sowed seeds, especially in areas far from any spruce source trees, on both the raked and intact plots. The seeds came from the 1999 cone crop or from northern Alberta. The researcher compared the survivorship of naturally recruited seedlings with planted seedlings to see if hare damage is a good deal worse for the nursery stock than the natural recruits.

010 **Biology**

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Reference Number: 12 402 680
Region: DC **Location:** Cameron Hills

Preconstruction Biophysical Site Assessment (Wildlife, Vegetation) of Potential Well Locations and Flow Line Options within the Significant Discovery Area, and Post-Construction Vegetation and Permafrost Monitoring on the Cameron Hills Gathering System

Annual monitoring of revegetation in four seeded and three unseeded areas, and the effectiveness of rollback to stop access on Paramount's Cameron Hills Gathering System and Transborder Pipeline are required to comply with regulatory (Mackenzie Valley Environmental Impact Review Board and National Energy Board) conditions. Revegetation plots were established on the work side, the trench, and the spoil side within the right-of-way, and a control plot was established in the undisturbed forest next to the right-of-way. Plant species, percent cover and plant vigour were recorded. Twenty permanent transects were established to monitor permafrost changes. Depth to permafrost was recorded, and settling, ponding, slumping and erosion were described. All plots and transects were marked and GPS-referenced. Seed germination was minimal on the seeded areas, and likely affected by spring runoff and losses to animals. Natural revegetation along the right-of-way is starting, but is minimal. Subsidence and water ponding along the pipeline is sporadic. Issues are primarily due to water flow management and there are no unstable ground conditions at this time. A remediation plan was generated to address the erosion and subsidence issues noted. Reports available include: "Cameron Hill Gathering System and TransBorder Pipeline Right-of-way Revegetation, Permafrost and Access Monitoring" and "Erosion Survey and Mitigation Plan for the Cameron Hills Gathering System and Pipeline".

011 **Biology**

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File No.: 12 402 585
Region: DC **Location:** Flat River at CanTung Mine, Tungsten

Aquatic Environmental Effects Monitoring – Flat River at CanTung Mine

EBA Engineering Consultants Ltd. conducted stream fisheries and benthos inventories on the Flat River near the CanTung mine for the North American Tungsten Corporation in the fall of 2002. These surveys provided baseline information on species presence, surface water quality and habitat conditions at one reference site (located 3 km upstream of the CanTung mine), a high exposure site (located between Tailings Ponds 1 and 2 and Tailings Pond 3) and a low exposure site (situated southeast of the airstrip). Fish species captured (using electrofishing) included slimy sculpin, Dolly Varden, round whitefish, and arctic grayling. The intensity of the sampling was not sufficient to allow for statistically significant comparisons of total fish abundance between sites. However, differences were noted, with the reference site exhibiting the highest abundance of fish, followed by the low exposure site. This trend was mirrored by total invertebrate densities at these sites, indicating a possible linkage between fish abundance and aquatic food supply. Other factors may have affected abundance, too. A direct comparison of fish condition (lengths and weights) between the sites was only possible for slimy sculpin; no statistical differences were observed. The benthos sampling program revealed statistically significant differences in the benthos community between the reference and exposure sites. Differences in species diversity, family diversity and total density may be due to a number of factors. While pollution-sensitive organisms were dominant at all sites, they comprised a greater percentage of all organisms sampled at the reference site compared to the exposure sites.

012 **Biology**

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Reference Number: 12 402 671
Region: NS **Location:** Iznogoudh and Itchen Lakes

Izok Project Environmental Baseline Studies

In May 2002, Inmet Mining Corporation initiated an update of the environmental baseline assessment of their proposed zinc-copper-lead mine on a property at Izok Lake in Nunavut and the Northwest Territories. The Izok Lake Project Area is located within the Coppermine River drainage, approximately 380 km north of Yellowknife. The hydrology and climate monitoring study involved collecting data on local climate (i.e., precipitation, air temperature, soil temperature, wind speed and direction, solar radiation and relative humidity), snow depth, lake water level and streamflow. The aquatic studies program focused on documenting spring (June) and fall (September) spawning habitat use within the study area and initiating a radio telemetry program to determine fish movements within and between study area lake basins. Additional components included monitoring of water temperature regimes, collection of benthic macroinvertebrate samples, and summarizing life history data from fish captured from the spawning and telemetry studies. The work completed in 2002 was scaled back significantly from what was originally planned, and no new work is planned for 2003.

013 **Biology**

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Reference Number: 12 402 642
Region: SS **Location:** Fox Holes Lake

Molecular Analysis of Evolutionary Change in Stickleback Populations

The goal of this research is to determine whether the same genes control similar skeletal changes in different populations and species. Stickleback fish are ideal subjects for this study because different populations show significant differences in skeletal structures. Variation in the pelvic skeleton may be the most striking of these differences: throughout the Northern Hemisphere, some populations of the ninespine stickleback (*Pungitius pungitius*) have complete pelvic spines (possibly for defence against predators) and a supporting pelvic skeleton while others have no pelvic structures at all. In order to test whether these similar skeletal changes also have a similar genetic basis, we collected sticklebacks without pelvic skeletons from an exceptional population in Fox Holes Lake and crossed them in the laboratory with sticklebacks with reduced and complete skeletons from other lakes in Canada and Alaska. This work was conducted in June 2002. The progeny from these crosses are currently growing in a laboratory at Stanford University. When the fish are large enough, the researchers will take DNA samples from them and attempt to find links between the completeness of the pelvic skeleton and specific DNA sequences. Thus, using fish from Fox Holes Lake will allow the researchers to map the genes responsible for evolutionary change in ninespine sticklebacks.

014 **Biology**

Landry, François
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Reference Number: 12 402 683
Region: NS **Location:** 12 Lakes at Ekati Diamond Mine

Fisheries Studies for 2002 Aquatic Effects Monitoring Program (AEMP) and Baseline Studies of the Ekati Diamond Mine

In August 2002, two Rescan environmental scientists sampled the fish communities of 12 lakes in the Ekati area with multiple, short-duration sets of 1.5 inch mesh sinking gillnets under a contract with BHP Billiton Diamonds Inc. Eight lakes (Vulture, Kodiak, Moose, Nema, Slipper, Cujo, Counts and Nanuq) were sampled as part of a long-term program to monitor the response of lake ecosystems to mine activities. Four lakes (Horseshoe, Ross, Fay and Logan) were sampled to establish baseline conditions prior to the construction of new diamond mine pits. In all lakes, fish (mainly round whitefish and lake trout, with some lake cisco, Arctic grayling, burbot and lake whitefish) were captured, counted and measured for length and weight. Ageing structures (scales and fin rays) were removed. For those fish that died during capture, samples of muscle and liver tissue were taken for measurement of metal concentrations, ovaries were taken for measurement of egg number and weight, stomach contents were taken for analysis of diet, and otoliths were removed for ageing. The rest of the catch was released live.

015 **Biology**

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Reference Number: 12 402 674
Region: NS **Location:** 31 km radius from the Snap Lake facility

Snap Lake Environmental Baseline Survey

The objective of this survey is to further establish baseline environmental conditions pertaining to air, water, aquatic organisms and wildlife resources in the area north of Snap Lake and to confirm predictions made in the environmental assessment. Angling took place along the shoal, in areas where wind and wave action would be high. A general examination of the fish caught in the North Lake showed that they were in a healthy condition free of external parasites. Fish in the Northeast Lake seemed to be in very good condition with no visible external abnormalities. Compared to the fish in the North Lake, Northeast Lake fish appeared larger, and in better condition overall. All fish were released after physical measurements were taken. Three adult longnose suckers were noted in a pool of North Lake tributary NLS-002. Stream velocities appeared low to moderate. Physical water parameters at the time of sample collection were DO: 15.97 mg/L; conductivity: 27 μS/cm; pH: 7.44; and temperature: 10.0°C. In addition, five adult northern pike were observed at NELS-005. The length of each pike was likely in excess of 750 mm. Four adult arctic grayling were also present near this location. One individual was approximately 200 mm long and was situated in a pool downstream of riffles. Detailed observations of the other three were not made.

016 **Biology**

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Reference Number: 12 402 641
Region: DC **Location:** BETA, East Liard area, Netla area, and Arrowhead areas near Fort Liard

Environmental Assessment for Drilling and Access Development in the Fort Liard Area

Anadarko Canada Corporation completed studies for an Environmental Impact Assessment for access and drilling of nine wellsites in the Fort Liard area. Baseline studies for soils, permafrost, wildlife, forest cover, and water resources were conducted on proposed project components (wellsites, access roads, campsites, etc.) between September 21 and October 7, 2002. The dominant soil type was luvisols. No evidence of permafrost was noted in proximity to any project components. Clearing requirements were assessed. Merchantable sizes and volumes of timber in the project consisted of white spruce, aspen, balsam poplar, black spruce and some birch. Project clearing was estimated to require approximately 18 loads of aspen, 12 loads of white spruce, 4 loads of black spruce, 3 loads of balsam poplar, and 1 load of birch. Aerial and ground searches for wildlife use and sign were completed. Wildlife observed in the project area included: great gray owl; black-capped chickadee; hairy woodpecker; red squirrel; pine grosbeaks; Northern hawk owl; spruce grouse; gray jays; and a moose. Other evidence of wildlife use included bear claw marks, ungulate browse, moose tracks and droppings, game trails, antler rubs, yellow-bellied sapsucker sign, three toed woodpecker flakings, and several red squirrel food caches. The only evidence of any listed species were several sets of woodland caribou tracks, though no caribou were seen. Water depths were measured on several local lakes to provide calculations of water volumes for use during the drilling program. Water volumes in local lakes were evaluated and ranged between 2,952 m^3 to 175, 823 m^3.

017 **Biology**

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Reference Number: 12 402 641
Region: DC **Location:** Chevron Pipeline right-of-way northwest of Fort Liard

Vegetation Monitoring of the Chevron Pipeline Right-of-Way, Fort Liard

Chevron has completed the 2002 Pipeline Vegetation Monitoring Project. The project is located along a 36-kilometre pipeline from the Chevron K-29 wellsite and processing facility to the Duke Energy Transmission pipeline near Fort Liard. The monitoring project tracks the re-vegetation progress to ensure related reclamation issues are addressed. The September 2002 vegetation monitoring compares plant growth and surface conditions to the vegetation surveys of 2000 and 2001. The same methods were used during the 2000, 2001 and 2002 vegetation surveys. In 2002, a total of 63 plant species were identified compared to 53 in 2001 and 45 in 2000. Native plant regeneration continues to increase from the edge of the right-of-way inward. No surface erosion, slope instability or pipeline settling were identified during the 2002 survey. During the past three growing seasons, an increase in the number and variety of plants established on the Chevron pipeline right-of-way has occurred and is continuing. The increase is a result of certain plants maturing and more plants germinating. The increase in the variety of plants is also expected to continue along the pipeline right-of-way.

018 **Biology**

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Reference Number: 12 402 681
Region: SS **Location:** Gahcho Kué (Kennady Lake)

Gacho Kué (Kennady Lake) Baseline Limnology Program

The Baseline Limnology Program included evaluations of physical, chemical and biological properties of three main basins of Gahcho Kué. The objective of this program was to continue baseline water quality monitoring and to complete determination of sediment accumulation rates. Specifically, the program assessed the following components: water column profiles of temperature, conductivity, and dissolved oxygen; water samples for nutrition, major ions, physical parameters, and total metals; zooplankton samples; and retrieval of sediment traps from the two deepest basins of Gahcho Kué. Baseline water quality investigations were conducted to address potential environmental assessment data requirements should this project proceed in future to the mine development stage. The sediment traps that were deployed in 2001 were retrieved from the north and south basins of the lake. Profiles of temperature, dissolved oxygen and conductivity showed that Gahcho Kué was generally well mixed. Concentrations of nutrients, major ions, trace metals and physical parameters were similar among basins. Despite seasonal fluctuations, community composition and relative densities of zooplankton were comparable to 2001 findings. Variations were considered to reflect the natural variability within the lake. Sediment accumulation rates for Gahcho Kué were low in comparison to Canadian lakes in general (including northern lakes such as Great Slave Lake and Lac De Gras), but comparable to rates for northern shield lakes.

019 **Biology**

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Reference Number: 12 402 601
Region: IN **Location:** Gwich'in Settlement Area near Tsiigehtchic

Environmental Assessment for Proposed 2002 / 2003 Oil and Gas Development Activities in the Gwich'in Settlement Area

Fieldwork for this study took place in October 2002. The objective was to assess environmental conditions at sites previously developed by Devlan Exploration Inc. within the study area, as well as to obtain additional baseline data on locations proposed for development. These data were used to help plan mitigation to minimize potential environmental impacts. The study area extended along a proposed winter road planned from Tsiigehtchic to a proposed well site (C-36) east of the Tree River. No stick nests were observed nor were any incidental wildlife observations made during an over flight of the access. Vegetation at the proposed well site was black spruce and tamarack. Two lakes, Gwit'it Van Choo and another just west of C-36 were surveyed for depth by motorised canoe. Gwit'it Van Choo was 5.5 m maximum depth, while the other lake was only 2 m and so not suitable as a potential water source. Field results and a summary of other existing baseline data for the area were included in an environmental impact assessment which accompanied land use permit and water licence applications to the Gwich'in Land and Water Board.

020 **Biology**

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Reference Number: 12 402 675
Region: DC **Location:** F-36 wellsite south of Fort Liard

Modified Phase II Environmental Assessment F-36 Wellsite

In August 2002, a field crew completed soil sampling at F-36 wellsite. The crew consisted of Alpine employees based out of Calgary and a Fort Liard Community Representative. The sampling helped the researchers determine what clean-up will be required. The scope of the work included sampling three areas of the lease: the flare stack, the dehydrator, and the southwest area and inspecting erosion and subsidence. The soils were field screened and samples were obtained and submitted to a laboratory. The findings included: at the flare stack hydrocarbons were present in the soil; there is no clean up of methanol required; there is no clean up at the dehydrator required; there were issues of erosion surrounding the lease; and the area of the former lagoon has subsided and water has collected within. The assessment will continue in the 2003 field season where additional soil will be sampled and remediation will be initiated.

021 **Biology**

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Reference Number: 12 402 675
Region: DC **Location:** Pointed Mountain Plant Site, northwest of Fort Liard

Phase II and III Environmental Site Assessment, Pointed Mountain Gas Plant and Associated Facilities

The Pointed Mountain Gas Plant, four associated wellsites, and some associated infrastructure are being decommissioned. Previous environmental work and public consultation at this site have identified several key areas of concern. The proponent, BP Canada, wished to assess these areas and facilitate final site rehabilitation. An environmental assessment was therefore conducted, which included soil, ground, and surface water investigation, remediation of any impact identified through the initial investigation, and reclamation. Areas to be assessed included; produced water storage, fuel storage, process areas, wellheads, and waste disposal locations. In addition, air and surface water quality adjacent to the site was evaluated. The decommissioning had a limited impact on the surrounding receptors, but included noise pollution, increased human activity and increased truck traffic.

022 **Biology**

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Reference Number: 12 402 675
Region: IN **Location:** shorelines within 200m of ferry landings near Tsiigehtchic and Fort McPherson

Aquatic Effects Study for the Ferry Crossings near Tsiigehtchic and Fort McPherson

The GeoNorth-AMEC-Ross team worked with the people of Tsiigehtchic and Fort McPherson to investigate the aquatic effects of ferry operations at the Mackenzie and Peel River crossings. These rivers have strong social, cultural and economic value to the Gwich'in of Fort McPherson and Tsiigehtchic. Fish harvesting is an important activity in both communities. Research activities in 2001 and 2002 focused on community consultation, river flow assessment, assessment of the ferry landing operations, a fish and fish habitat study, water quality sampling, and a traditional knowledge study. Local research partners were instrumental in field logistics, data collection, dissemination of results and collection of community feedback. The eddies up and down stream of the ferry landings are popular locations for setting nets and harvesting fish. Eddies that form around the ferry landings may fill in with sediments naturally carried by the rivers. Eddies occur naturally along the rivers and their creation and infilling is a natural process. The health of the fish populations around the ferry landings has not changed because of the ferry landing operations, and there is no evidence to indicate that fish have been otherwise affected. Fish do not seem to use this area for feeding, resting or spawning as it is unsuitable habitat for most fish species. The study showed that the ferry operations do not have a significant effect on water quality. The community is concerned that other activities such as oil and gas exploration and development, climate change and municipal development may affect the Mackenzie and Peel Rivers now and in years to come.

023 **Biology**

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Reference Number: 12 402 631
Region: NS **Location:** Panda Diversion Channel and inflowing tributaries of Grizzly Creek and Buster Creek at Ekati Diamond Mines

2002 Panda Diversion Channel Monitoring Program

The purpose of this project is to monitor the effectiveness of created fish habitat within the Panda Diversion Channel at Ekati Diamond Mines. Assessments included an examination of fish and invertebrate utilization of the habitat structure. Arctic grayling use the channel for spawning, rearing, forage, nursery and migration purposes. Other species of fish such as: lake trout; slimy sculpin; lake chub; round whitefish; and burbot were also documented in the channel. When compared to 1998-2001 results, numbers of adult grayling entering the channel in the spring of 2002 were the second highest on record. Overall channel residence and larval emergence times (17-23 days) for grayling were consistent with other low flow years. Despite high numbers of fish entering the channel during the spring migration, lower than expected numbers of young-of-year (YOY) grayling were collected in 2002. This is most likely the result of a variety of interrelated factors, including potential early out-migration of YOY fish and fewer eggs being deposited in the channel due to smaller spawning grayling population (size-fecundity relationship). Benthic invertebrate and periphyton communities inhabiting the channel, Grizzly Creek and associated habitats were found to be quite diverse and abundant; 108 distinct benthic-invertebrate and 112 periphyton taxa were collected. These are extremely important for providing a stable forage base for the fish population utilizing the channel habitat. Overall, the 2002 results support the conclusion that the channel is continuing to function as designed. Specifically, the channel is providing suitable habitat for numerous fish species during a variety of life stages, as well as maintaining stream connectivity and migration habitat during the open water season between North Panda and Kodiak Lakes. In addition to fish, the channel provides important habitat for algal, invertebrate and terrestrial vegetation colonization.

024 **Biology**

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Reference Number: 12 402 631 (13375)
Region: NS **Location:** Ekati Diamond Mine (Panda Diversion Channel and Ponds A, B, C, D, E, F and G)

2002 Baseline Fisheries Assessment – Ekati Ponds

The objective of this study was to collect detailed baseline information on several seasonal streams and ponds on BHP Billiton's Ekati Claim Block, confirm the presence or absence of various fish species in the proposed areas, and determine their value as a fisheries resource. This study was conducted at Ekati Diamond Mine (Panda Diversion Channel and Ponds A, B, C, D, E, F and G). Where possible, all captured fish were live released into their original bodies of water after assessment. All sampling and assessments were confined within the mine area. Sampling techniques and associated equipment did not create impacts.

025 **Biology**

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Reference Number: 12 402 638
Region: SA **Location:** Sahyoue Peninsula, Great Bear Lake

A Reconnaissance of the Flora and Fauna of Edacho/Sayhoue

Biological investigations were conducted on Edacho during July 2000 and June 2001 and on Sahyoue during August 2001 and June 2002. The objective was to describe vegetative community types and the flora and fauna present in these peninsulas in Great Bear Lake. Twenty community types were distinguishable in the field: white spruce closed and open canopy; white spruce open canopy on lichen and sphagnum; black spruce open canopy on sphagnum; mixed forest; deciduous young; deciduous closed canopy; tall shrubland open and closed canopy; low shrubland open and closed canopy; low shrubland regeneration; lichen cover; herbaceous cover - graminoid, herbaceaous cover – herbs; non- or sparsely vegetated; esker; wetlands and water. A total of 236 vascular plant species representing 45 plant families were documented during the 2000-2002 reconnaissance surveys from both peninsulas. Eight plant families accounted for over 60% of the species total: Cyperaceae; Asteraceae; Poaceae (Gramineae); Salicaceae; Rosaceae; Ericaceae; Caryophyllaceae; and Fabaceae (Leguminosae). A total of 577 wildlife observations, which consisted of direct observations of sightings, tracks, scat and browse, were recorded for Sahyoue and Edacho. These observations represent 102 vertebrate species: 1 amphibian, 5 fish, 78 birds; and 18 mammals.

026 **Biology**

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Reference Number: 12 402 677
Region: IN, SA **Location:** 130 km SE of Tsiigehtchic, 130 km west of Fort Good Hope

Environmental Survey of a Proposed Winter 2D Seismic Program in EL 415, Including Winter Access

This study is to obtain specific environmental information to be used in the preparation of an environmental impact assessment for a land use permit application for a winter 2D seismic program spanning Gwich'in and Sahtu Settlement Areas. Researchers accessed the study area by helicopter and on foot. An overflight of the proposed and alternate access routes and the study area was conducted, with ground checks at proposed crossings and as needed in relation to other sensitive features such as dens. All observations or signs of wildlife were recorded, linking observation to a habitat type and GPS location. Emphasis was on raptors and their nests, moose and caribou, and carnivores and their dens. Main vegetation types were determined from aerial photos and confirmed in the field. Fish habitat and stream bank details were undertaken through the Prince of Wales Northern Heritage Centre. Based on the results, recommendations for field surveys were made. Publicly available heritage resource information was obtained from the appropriate co-management boards, including camps, trails, and traditional hunting and fishing areas. The need for verification or additional traditional knowledge work was discussed. No animals were captured or handled.

027 **Biology**

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Reference Number: 12 404 412
Region: SS **Location:** Wood Buffalo Park and around Sandy Lake Road, outside the boundary of the Park

Carbon Dynamics in Chronosequence of Boreal Forest Ecosystems: A Production Ecological Approach

Northern boreal forest ecosystems absorb carbon dioxide (CO2) in the air and contribute to the maintenance of the global CO2 balance. However, the amount of CO2 that boreal forests fix annually is unknown. This research team began measuring the movement of carbon, an element found in CO2, in boreal forests of Wood Buffalo National Park two years ago, using a method based on ecological techniques. Measurement and monitoring continued in 2002. Astonishingly, the data so far indicates that the boreal forests of the study area are losing carbon to the atmosphere, instead of fixing carbon to reduce its atmospheric concentration. In other words, the present data seem to suggest that the boreal forests are a cause of the increase in atmospheric CO2 concentration. The project team sees some possible explanations of arguing against this thesis; however, there is also possibility that this finding is real. Further accumulation of data is certainly necessary to tell the true story.

028 **Biology**

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Reference Number: 12 402 670
Region: DC **Location:** 2km zone along the proposed pipeline corridor in the Deh Cho Region

2002 Aquatic Studies in the Deh Cho Region

Aquatic studies were carried out in the Deh Cho Region in 2002 as part of a feasibility study for the Mackenzie Delta Gas Opportunity. Stream hydrology measurements were undertaken at 28 survey sites in mid-April to characterize the winter low-flow conditions. Many of these drainages are known to be spring-fed. Detailed observations of ice break-up and spring flooding were made at 39 sites during the spring studies undertaken in June. Fish spawning surveys were conducted at 36 stream crossings in May-June. These concentrated primarily on assessing habitat conditions and use by spring spawning species (e.g., Arctic grayling, northern pike, walleye, and sucker). Detailed summer aquatics surveys were conducted on 37 streams and 4 large rivers. Activities included: fish sampling; detailed habitat assessment and mapping; hydrology studies; bathymetric surveys; measuring basic water quality parameters; water and sediment sampling; and photo-documenting habitat conditions. Fall spawning surveys were conducted at 26 stream crossings in October. Target species for fish sampling, egg sampling, and habitat surveys included lake whitefish, broad whitefish, cisco, lake trout, and inconnu. Reconnaissance level hydrogeology studies were undertaken in the winter. Observations were made at selected crossings and in areas of visible or reported springs or icings. Detailed studies were undertaken in August at 25 sites. The work involved documenting characteristics of springs, flow measurement and water quality sampling.

029 **Biology**

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Reference Number: 12 402 670
Region: IN **Location:** the proposed pipeline corridor within the Gwich'in Settlement Area

2002 Aquatic Studies in the Gwich'in Settlement Area

Aquatic studies were carried out in the Gwich'in Settlement Area (GSA) in 2002 as part of a feasibility study for the Mackenzie Delta Gas Opportunity. Winter hydrology and water quality studies involved gathering general site information at nine different stream crossings. Bottled samples were taken for additional analysis. A spring survey characterized ice break-up and flooding in 23 streams. Two temporary monitoring stations were installed at the Travaillant River and an unnamed stream to measure and record water depth during the open water season. The summer program involved collecting data on water elevation and flow at the stations and collecting water and sediment samples from three watercourses. The fall program involved measuring discharge and water surface elevation at the monitoring stations. Spring investigations of fish and fish habitat included both aerial and ground surveys to determine habitat use by spring spawning fish species in 14 watercourses. Detailed fisheries surveys were conducted during the summer to determine habitat potential in six streams. A fall fisheries survey was conducted to determine habitat use by fall spawning fish species in selected watercourses. Based on the summer detailed habitat surveys, four of the larger streams were identified as having potential for use by fall spawning species and were assessed by aerial and ground surveys. The hydrogeology program was limited to a spring over flight to identify locations of surface icings, indicating the presence of springs.

030 **Biology**

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Reference Number: 12 402 670
Region: IN **Location:** the proposed pipeline corridor within the Inuvialuit Settlement Region

2002 Aquatic Studies in the Inuvialuit Settlement Region

Aquatic studies were carried out in the Inuvialuit Settlement Region (ISR) in April 2002 to characterize the low-flow conditions during the winter months. All but one of the seven watercourse crossing sites visited were either frozen to the bottom or could not be found. Spring hydrology studies involved detailed observations of ice break-up and spring flooding. Ground surveys were conducted at three sites and 17 sites were surveyed from the air. Spring investigations involved surveying 16 stream crossings and assessing habitat conditions and use by spring spawning species (e.g., Arctic grayling, northern pike, walleye, and sucker). Detailed aquatics assessments were conducted during the summer on 12 small streams, 12 larger rivers and delta channels and 17 lakes. Activities included: fish sampling; detailed habitat assessment and mapping; bathymetric surveys; measuring basic water quality parameters; water and sediment sampling; and photo-documenting habitat conditions. Fall spawning surveys of three streams were conducted in September. Target species for fish sampling, egg sampling, and habitat surveys included lake whitefish, broad whitefish, cisco, lake trout, and inconnu. A hydrogeology survey was conducted in September to identify groundwater features. General observations were that groundwater contributions to stream flow are generally small, and related to thawing of the active soil layer.

031 **Biology**

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Reference Number: 12 402 670
Region: SA **Location:** watercourse crossings located in the proposed pipeline corridor in the Sahtu Settlement Area

2002 Aquatic Studies in the Sahtu Settlement Area

The researchers collected information about fish habitat features and use on watercourse crossings located within the proposed pipeline corridor in the Sahtu Settlement Area (SSA). Surveys of fish and fish habitat were made at 62 permanently flowing watercourses, as well as 15 intermittent streams. These studies included hydrology and water quality work as well. Although the baseline studies focused on the collection of fish habitat data, some sampling of fish was required. Fish sampling was done primarily to confirm historic information, confirm fish presence/absence and to confirm habitat use. Non-lethal fishing methods such as electrofishing, seining, or setting baited minnow traps were used. All fish captured were identified to species and life stage, measured to fork length and released at the location where they were captured. Traditional knowledge was identified, gathered, and validated through participative, community driven research methods. Participative processes were employed to ensure that stakeholders who hold valuable information are consulted. Study methods may involve community workshops, individual and group interviews, and site visits to significant biophysical or cultural locations.

032 **Biology**

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Reference Number: 12 402 670
Region: DC **Location:** the proposed pipeline corridor and possible diversions in the Deh Cho Region

2002 Route and Site Selection in the Deh Cho Region

Throughout the summer and fall a number of route and site selection flights were conducted in the Deh Cho Region. Six programs were carried out to support planning for pipeline design and construction. The pipeline routing program was carried out to gather information regarding environment and terrain along the potential pipeline route and to identify alternate routes. The granular resources program consisted of an overview of potential granular resource sites to explore if they were viable and how the needs and requirements of the engineering and construction team would affect the environmental components of the sites. The infrastructure reconnaissance involved the examination of the typical terrain and watercourses in the vicinity of potential infrastructure sites in the Deh Cho. Both of the above programs were extended by having wildlife, fisheries, vegetation and historical resources specialists conduct overviews of each site. The river reconnaissance was carried out to review proposed major pipeline river crossing locations and to visually assess the technical suitability of each crossing with respect to hydrology, slope stability and constructability. The environmental protection planning program was undertaken to provide the members of the EPP/EMP team a better understanding of the physical terrain and watercourses that would be encountered in the Deh Cho. The ground control program primarily involved taking very accurate GPS measurements at locations of easily identified features to improve accuracy.

033 **Biology**

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Reference Number: 12 402 670
Region: IN **Location:** the proposed pipeline corridor within the Gwich'in Settlement Area

2002 Route and Site Selection in the Gwich'in Settlement Area

A number of route and site selection flights were conducted in the Gwich'in Settlement Area (GSA). Six programs were carried out to support the planning for pipeline design and construction. The pipeline routing program was carried out to gather information regarding environment and terrain along the potential pipeline route and to identify other alternate routes. The granular resources program consisted of an overview of potential granular resource sites to explore if they were viable and how needs and requirements for the engineering and construction team would affect the environmental components of the sites and by having wildlife, fisheries, vegetation, and historical resources specialists conduct overviews of each site. The infrastructure reconnaissance involved examination of the typical terrain and watercourse in the vicinity of potential infrastructure sites in the GSA and by having wildlife, fisheries, vegetation, and historical resources specialists conduct examinations of the proposed pipeline corridor. The river reconnaissance program was carried out to review proposed major pipeline river crossing locations and to visually assess the technical suitability. The environmental protection planning program was undertaken to provide a better understanding of the physical terrain and watercourses in the GSA. The ground control program involved taking very accurate GPS measurements at locations of easily identified features for improving the accuracy for recent and planned aerial photography and on scanned NTS maps.

034 **Biology**

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Reference Number: 12 402 670
Region: IN **Location:** the proposed pipeline corridor within the Inuvialuit Settlement Region

2002 Route and Site Selection in the Inuvialuit Settlement Region

Throughout the summer and fall, a number of route and site selection flights were conducted in the Inuvialuit Settlement Region (ISR). The pipeline routing program was carried out to gather information regarding environment and terrain along the potential pipeline route and to identify other alternative routes. The granular resources program consisted of an overview of potential granular resource sites to explore if they were viable and how the needs and requirements of the engineering and construction team would affect the environmental components of the sites. The infrastructure reconnaissance involved the examination of the typical terrain and watercourses in the vicinity of potential infrastructure sites in the ISR. These programs were extended by having wildlife, fisheries, vegetation and historical resources specialists conduct overviews of each site. The river reconnaissance program was carried out to review proposed major pipeline river crossing locations and to visually assess the technical stability of each crossing with respect to hydrology, slope stability and constructability. The environmental protection planning program was undertaken to provide the members of the EPP/EMP team a better understanding of the physical terrain and watercourses that would be encountered in the ISR. The ground control program primarily involved taking very accurate GPS measurements at locations of easily identified features to improve accuracy.

035 **Biology**

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Reference Number: 12 402 670
Region: SA **Location:** the proposed pipeline corridor within the Sahtu Settlement Area

2002 Route and Site Selection in the Sahtu Settlement Area

This study is a continuation of baseline studies conducted by Imperial Oil Resources, CONOCO Canada Resources Limited, Shell Canada Limited, and ExxonMobil Canada during 2001 as part of a feasibility study for the Mackenzie Delta Gas Opportunity. Route and site selection flights were used to: 1) determine the location for a potential natural gas pipeline route and associated developments through the Sahtu Settlement Area; 2) visually inspect and confirm land forms and geotechnical features; 3) identify land features that may be important to the location or construction of a potential gas pipeline; and 4) determine the locations for potential facility sites, access points to the right-of-way, staging areas, borrow sources, gravel resources, camp locations, etc. During overflights, the locations of important land features were determined by Global Positioning System (GPS), and photographs or videos were taken. Landings occurred at selected sites where more detailed observations were required. Traditional knowledge (TK) as it relates to route and site selection was identified, gathered, and validated through participative, community driven research methods.

036 **Biology**

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Reference Number: 12 402 670
Region: DC **Location:** the proposed pipline corridor within the Deh Cho Region

2002 Terrestrial Studies in the Deh Cho Region

Terrestrial studies were carried out in the Deh Cho Region in 2002 as part of a feasibility study for the Mackenzie Delta Gas Opportunity. A survey and preliminary ground inspections for rare plants were done along the proposed Mackenzie Valley Pipeline corridor. Thirty-eight sites were surveyed, of which 28 were in uncommon vegetation communities. One rare plant species, prairie gentian (*Gentiana affinis*), was recorded at two locations. Monitoring was undertaken in August on permanent revegetation transects that were established in 1984-1985. The effects of seed and fertilizer on right-of-way revegetation were assessed, and changes in vegetation cover since 1986 were evaluated at 18 plots. Estimates were made of percent ground cover for live and dead plants and a photograph was taken at each transect. Vegetation was inventoried and mapped within a 1-km wide study area along the proposed corridor to provide a current map and database of vegetation types. Mapping was based on interpretation of 1:30,000 air photos as well as field work. Field sampling was undertaken to develop descriptions for vegetation types and ecological units and to confirm mapped units. Species lists were made for each plant community surveyed. The South Taiga Plains Ecological Zone is represented along the proposed corridor throughout the Deh Cho Region. A total of 23 South Taiga Plains vegetation types were mapped and described in detail.

037 **Biology**

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Reference Number: 12 402 670
Region: IN **Location:** the proposed pipeline corridor within the Gwich'in Settlement Area

2002 Terrestrial Studies in the Gwich'in Settlement Area

Rare plant surveys were carried out in the Gwich'in Settlement Area in 2002 as part of a feasibility study for the Mackenzie Delta Gas Opportunity. A reconnaissance survey and preliminary ground inspections for rare plants were done within a 1-km corridor along the proposed Mackenzie Valley Pipeline corridor. There were two crews, each including two botanists, a soil scientist and a Gwich'in assistant. The approach of the 2002 surveys was to focus on habitats with the highest probability of supporting rare plant species, based on the rare plant list for the Northwest Territories and what is known about the habitats in which they are found. Locations of potential sites observed during the reconnaissance were recorded for future investigation. Approximately 25 sites were surveyed on the ground. Species lists were made for each plant community surveyed. No rare plant species were observed during the 2002 surveys.

038 **Biology**

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Reference Number: 12 402 670
Region: IN **Location:** the proposed pipeline corridor within the Inuvialuit Settlement Region

2002 Terrestrial Studies in the Inuvialuit Settlement Region

Terrestrial studies were carried out in the Inuvialuit Settlement Region (ISR) in 2002 as part of a feasibility study for the Mackenzie Delta Gas Opportunity. A reconnaissance survey and preliminary ground inspections for rare plants were carried out along the proposed Mackenzie Valley Pipeline corridor during mid-July and in the Parsons Lake area in August. The surveys focused on habitats with the highest probability of supporting rare plant species, as well as the granular substrates near Parsons Lake. Approximately 34 sites were surveyed and species lists were compiled for each plant community surveyed. No rare species were conclusively identified in the field. One potential rare species is Yukon stitchwort (*Minuartia yukonensis*). A survey was conducted in August to gather information on long-term effects of seed and fertilizer applications (or the lack thereof) on the reestablishment of native plant cover, and to evaluate the efficacy of the resultant plant cover to stabilize sites and control surface erosion. Study crews looked at long-term reclamation on wellsites and sumps from the 1970s. It was generally found that natural succession is occurring, although the effects of salt and petrochemical spills are still visible. A survey was conducted in August to produce a map (1:30,000 scale) of vegetation types with consistent quality and details. Visual checks were made using a map developed during the spring of 2002.

039 **Biology**

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Reference Number: 12 402 670
Region: SA **Location:** the proposed pipeline corridor within the Sahtu Settlement Area

2002 Terrestrial Studies in the Sahtu Settlement Area

Terrestrial studies were carried out in the Sahtu Settlement Area (SSA) as part of a feasibility study for the Mackenzie Delta Gas Opportunity. A reconnaissance survey and preliminary ground inspections for rare plants were done along the proposed Mackenzie Valley Pipeline corridor. Thirty-nine sites were surveyed, of which 28 were in uncommon vegetation communities. Two rare plant species were found: Rolland's bulrush (*Scirpus rollandii*); and smooth wild rose (*Rosa blanda*). Monitoring was undertaken on permanent revegetation transects that were established in 1984-1985. The effects of seed and fertilizer on right-of-way revegetation were assessed, and changes in vegetation cover that had occurred since 1986 were evaluated at 16 plots. Estimates were made of percent ground cover, and a photograph was taken at each transect. Vegetation was inventoried and mapped within a 1-km wide study area along the proposed corridor, and a map atlas and database of vegetation types was produced. The mapping was based on interpretation of air photos as well as field work. Field sampling was undertaken to develop descriptions for vegetation types and ecological units and to confirm mapped units. Species lists were made for each plant community surveyed. A total of 19 vegetation types were mapped in the North Taiga Plains and in the South Taiga Plains 22 vegetation types were represented.

040 **Biology**

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Reference Number: 12 402 678
Region: IN, SA **Location:** 3 test areas 90km in length in the Mackenzie River

Acoustic and Biological Test Study for the WesternGeco 2D Mackenzie River and Delta Seismic Programs

The environmental impacts of using airguns as a seismic source in a fish-bearing water body were monitored during a two-dimensional summer seismic research program in the Mackenzie River and Delta. Three test locations were established in the vicinity of Norman Wells (South River Test Area), east of Tsiigehtchic (North River Test Area), and within the Mackenzie River Delta (Delta Test Area). Eight species of small- and large-bodied fish endemic to the Mackenzie River were used to test the immediate and post exposure (48 hrs) effects of airgun noise. No fish died during the exposure to noise from airguns. Four fish died within the 24-hour holding period, but none were from exposure to the airguns. It appears that these fish died due to holding stress. Four transects were established in the three study areas and all were repeatedly sampled using hydroacoustics. The transects were sampled during normal operations of the seismic vessels. Assessment of data reveals that there was no 'herding' of fish in front of the seismic vessels, nor was there an effect on fish distributions during airgun operations. Horizontal sampling to detect movement was conducted using hydroacoustics while the seismic vessel was stationary and the airguns were simulating ramp-up followed by one minute of firing. Results indicate that while airguns were ramping up, fish did not alter their original path.

041 **Biology**

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Reference Number: 12 402 654
Region: IN **Location:** Sachs Harbour, Paulatuk, Holman, Tuktoyaktuk, Aklavik, Tsiigehtchic, Fort McPherson, and Inuvik

Snow Change: Indigenous Observations of Climate Change Across the Circumpolar North

A research group from the Tampere Polytechnic in Finland are the coordinators of a circumpolar research project to document indigenous observations of climate change. Two researchers from Finland came to Canada as part of this project and interviewed participants from communities in the Yukon, Nunavut and the NWT. In the NWT much work was done in conjunction with existing projects, but some original interviews were done in the communities of Sachs Harbour, Paulatuk, and Tsiigehchic. More information and the results of these interviews can be found on the project website at www.snowchange.org

042 **Biology**

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Reference Number: 12 402 584
Region: SA **Location:** approximately 20 plots throughout the Sahtu Region

Establishment of Permanent Monitoring Plots in Sahtu for Growth and Yield, National Forest Inventory and Cumulative Impact Monitoring

During this project, 19 permanent monitoring plots (PMPs) were successfully established in the Sahtu Region. The project was successfully completed with a total of 19 PMPs established. The PMPs will be used to obtain information to assess rates of forest growth and to determine current and potential yields of various forest types. This data is also used for cumulative impact monitoring for the Western NWT Biophysical Study, and for the National Forest Inventory, which aims to assess and monitor the extent, state and sustainable development of Canada's forests. In August 2002, a training program was conducted in the Sahtu and Inuvik Regions. The program was designed to train Department of Resources, Wildlife and Economic Development staff and local community members in the procedures involved with the establishment of PMPs to determine forest growth, cumulative impact monitoring and national reporting. A one-day office training session was conducted with four participants. On the second day, six participants were brought into the field to establish one PMP as a group. On the third day, the participants were split into two groups and established two PMPs. A similar program was carried out in Inuvik. Following the training, seven National Forest Inventory plots and nine growth and yield plots were established in the Sahtu. Additional plots are scheduled for establishment over the next few years with a re-measurement program to be carried out on a 5- to 10-year rotation.

043 **Biology**

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Region: IN **Location:** Mackenzie Delta

Reproductive Ecology of Tundra Swans in the Mackenzie Delta

Nine local knowledge interviews were completed in the communities of Aklavik, and Fort McPherson in 2001. In Fort McPherson, a local expert was hired to conduct the interviews and follow-up meetings will be completed in cooperation with the expert interviewer. In Aklavik, a local elder was hired to do the interviews while the researcher did the recording. The other methods proved beneficial to both the researcher and the research assistant. Finally, one month was spent with a Gwich'in elder on the land during spring break up to learn about the arrival of swans and other waterfowl in the Mackenzie Delta. A formal interview was also completed and the project was discussed with several Gwich'in hunters who passed through the camp. Data from all the local knowledge interviews will be summarized. A parallel science project collecting field data on reproductive ecology of tundra swans will continue during the summer of 2002.

044 **Biology**

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File No.: 12 402 672
Region: IN **Location**: along the Dempster Highway in the Gwich'in Settlement Area

A Review of the Butterfly Genus Erebia (Lepidoptera, Nymphalidae, Satyrinae)

This research constitutes the first stage of a long term (*ca* 6-8 years) review of the large and complex circumpolar butterfly genus *Erebia* (Satyrinae), in order to update the generic revision of Warren (1936, *Monograph of the genus* Erebia), now long out of date. The purpose of this fieldwork was to photograph adult *Erebia* specimens and habitats, collect voucher specimens (dry) for systematic studies, and collect voucher specimens (in alcohol) for molecular analysis. Fieldwork was concentrated along the Dempster Highway. Unfortunately, the spring was very late in 2002, and the whole fieldwork period was unseasonally wet, with long periods of continual rain. As a result, some butterfly species appeared only in very small numbers; others failed to appear at all in some localities. This is not unusual in arctic regions. Nevertheless, due in large part to data generously provided by Dr. K. Philip, University of Alaska, Fairbanks, 12 of the 14 *Erebia* species were seen, albeit in unusually small numbers in most cases. Sufficient material was obtained to enable genitalia preparations to be made of all species seen (male genitalia are important diagnostic features in most Lepidoptera groups), and photographs were obtained of habitats and of adult butterflies. It was hoped that sufficient material would be collected from a geographically wide area and a large number of localities to allow meaningful collection of specimens in alcohol for mitochondrial DNA analysis, but this was not possible. Despite a lack of available material, most aims were achieved, and the project is considered to have been an overall success. A further attempt may be made in the future to obtain material for molecular analysis.

045 **Biology**

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Reference Number: 12 402 676
Region: IN **Location:** Peel River near Fort McPherson and Travaillant Lake

Fisheries Research Projects in the Gwich'in Settlement Area: Peel River Fish Study and Travaillant Lake Floy-tagging

Two fisheries studies were conducted in 2002: Travaillant Lake floy-tagging and the Peel River Fish Study. In the spring, elders and harvesters in Tsiigehtchic were interviewed to collect community knowledge about fish and fish movements in Travaillant Lake, the largest lake in the Gwich'in Setttlement Area. Fish in Travaillant Lake were captured live and floy-tagged during July and September. Field crews set floating multi-mesh and 5 inch mesh nets at the southern end of the lake and captured lake whitefish, broad whitefish, least cisco, northern pike, and lake trout. A total of 44 lake whitefish, 35 broad whitefish, and 16 lake trout were measured, floy-tagged and released. No tags were returned in 2002. This year (2002) was the fifth and final year of the Peel River Fish Study. Nets were set for 24 hours on Mondays, Wednesdays, and Fridays throughout the study period. 70 herring (arctic and least cisco), 260 broad whitefish, 64 coney (inconnu), 90 crookedback (lake whitefish), and 52 jackfish (northern pike) were caught. Samples from these fish will be analyzed to determine how old they were. Data collected during the five years of sampling will provide baseline information for future monitoring of the Peel River fish stocks.

046 **Biology**

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Reference Number: 12 402 676
Region: IN **Location:** throughout the Gwich'in Settlement Area

Forestry Research Projects in the Gwich'in Settlement Area: Seismic Line Revegetation

Seismic line cutting in the 1960s and 1970s resulted in hundreds of kilometres of cleared 9 metre lines that crisscross the Gwich'in Settlement area. There is now the opportunity to assess how well northern forests have recovered from the disturbance. Sites along seismic lines crossing upland black spruce forests and Mackenzie delta white spruce forests were visited in the summer of 2002. Nine sites were surveyed in the Mackenzie River delta along seismic lines cut between 1969 and 1971. Disturbed sites had deeper active layers (depth of thaw) and denser tall shrubs than undisturbed areas adjacent to the seismic lines. White spruce seedlings were abundant on the disturbed sites but rare on the undisturbed areas. These seedlings were found to range between 1-28 years old. In the upland black spruce areas, 53 sites were surveyed south of Fort McPherson and Tsiigehtchic. Disturbed sites had deeper active layers than undisturbed areas adjacent to the seismic lines and thick shrub layers. Black spruce seedlings were commonly found on the disturbed sites but were rare in the undisturbed areas. Most black spruce seedlings started to grow 15 years after the seismic line cutting.

047 **Biology**

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Reference Number: 12 402 653
Region: DC,SS **Location:** sample plots throughout areas surrounding Ft. Providence, Ft. Smith and Ft. Simpson

Physical Properties of Dead and Downed Round-wood in the Boreal Forests of Western Canada

This study estimates coarse woody debris (CWD) data in the various dominant forest types common across western Canada. The applications of these numbers are for forest fuels/behavior and also for calculating for carbon budgets that will be needed under the Kyoto Accord. Researchers measured the wood on the forest floor in terms of diameter, specific gravity, tilt angel, and general abundance to make the calculations of weight per hectare. Data was collected on jack pine, lodgepole pine, aspen, balsam poplar, black spruce, white spruce and tamarack. Locations of these species were in relatively pure stands, and we sought to locate a minimum of 4 replicates for each stand/species type. Stands in the NWT were chosen partly based on access constraints around the Fort Simpson and Fort Providence areas.

048 **Biology**

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Reference Number: 12 402 653
Region: IN **Location:** Dempster Highway (airport to Rengling River), 3 non-fish bearing ponds (Inuvik airport/townsite area), Mackenzie River (Point Separation to mouth of Peel)

Alternate Forest Products: A Dynamic Time and Space Model of Driftwood Along the Lower Mackenzie River

This was the second year of a study to examine the amount and quality of driftwood that flows past Gwich'in Settlement Area communities where members have always used this resource; now there is increasing interest in industrial uses for driftwood. There is concern that if riverside forests are harvested or the driftwood inventory is removed upriver, the lower communities will lose this annual supply of wood and suffer economic hardship. Researchers examined how driftwood flows downriver at spring breakup, we studied how fast driftwood sinks, and estimated the quality of driftwood along riversides. It was found that there are surprisingly few good-quality logs over 30cm in diameter that float down-river during and after spring breakup. Most logs were white spruce, with a very few balsam poplar and fewer pine. In our field and lab studies on the rate that logs sink, we found that black spruce and especially paper birch and tamarack were so dense that they sank within a few months to a year of falling into the water. This is why so few logs of these species are found floating and why they are so rare along rivers and on lake shores. For the riverside driftwood, we found that much of this wood was rotted to the point of only being good for wood chips.

049 **Biology**

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Reference Number: 12 402 682
Region: NS **Location:** Lac de Gras

Aquatic Effects Monitoring Program (2002)

This project was the second year of post-baseline aquatic effects monitoring. Problems identified during the implementation of the program in 2001 were corrected during the 2002 program. It was found that despite the close (60m) proximity of SNP Station 19 to the effluent diffuser, the only parameter that was elevated was turbidity. Ice-cover concentrations at SNP Station 19 tended to be higher and more variable than open-water concentrations, which is likely the result of increased wind driven lake circulation in the open-water. Median ice-cover concentrations of total aluminium, arsenic, total phosphorus and turbidity from the station were greater than the mid field percentages. The chlorophyll *a* concentration and zooplankton biomass were at the baseline range at the far, mid and near field ranges. The program is now sufficiently robust to enable repeatable year-over-year sampling, yielding good quality information from which to monitor possible changes to the aquatic environment of Lac de Gras.

ENGINEERING

050 **Engineering**

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Reference Number: 12 406 031
Region: IN **Location:** Tuktoyaktuk

Devon Canada Mackenzie Delta Test Ice Pad

Devon Canada is evaluating the feasibility of using an insulated, refrigerated ice pad as an exploration drilling platform for onshore drilling in the Mackenzie Delta. The test pads were constructed on two terrain types – a dry, well drained area and a wet, ponded area – to evaluate the performance of the test pads. The pads were designed to remain frozen through the summer under design ambient climatic conditions. Insulation and a hybrid thermosyphon system were incorporated into the design. The pads were covered with surface mats, geomembrane liner, and geotextile to simulate a drilling platform. A ground temperature cable was installed at each pad to measure temperatures at various locations near the surface of the ice layer and below the centre of the ice pad, up to a depth of 5.5 m below the ice pad surface. Dataloggers were attached to each temperature cable, recording temperatures at six-hour intervals. The results of the temperature monitoring program demonstrated that an insulated and refrigerated ice pad system could maintain the ice layer and underlying permafrost subgrade frozen through the summer. Results were reviewed using a finite element thermal model to calibrate the thermal model, thermal properties of the pad materials, and thermosyphon performance of the two test ice pads. The results of the calibration analysis indicated that the thermal model could accurately predict pad temperatures. The thermal model was used to develop design criteria for supporting a drilling rig that could tolerate up to 50 mm of settlement. It was determined that an ice layer 400 mm thick would have to be colder than -3ºC to maintain creep settlement of the ice layer within the 50 mm tolerance.

FOSSILS

051 **Fossils**

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Region: DC **Location:** Southern Mackenzie Mountains

New Ischnacanthiform Acanthodians from the Lower Devonian of the Mackenzie Mountains

The research objective was to recover additional specimens of ischnacanthiform acanthodians from Lower Devonian rocks, and use these specimens to clarify issues surrounding systematics and growth of these ancient fishes. In late July, 2002, a field crew traveled to the Man on the Hill fossil locality (GSC locality 69014) in the southern Mackenzie Mountains. Fieldwork participants stayed in a remote camp at the locality and spent several days collecting fossil specimens of early vertebrates. Special consideration was taken to look for acanthodian fossils. Specimens were returned to the collections at the University of Alberta Laboratory for Vertebrate Paleontology. Few ischnacanthiform acanthodians specimens were discovered at the MOTH locality this year. Specimens recovered fit into existing (proposed) species. Articulated body fossils with open mouths, the type of fossils most hoped for, were not discovered.

052 **Fossils**

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Reference Number: 12 412 038
Region: SA **Location:** southwest portion of Wrigley Lake and upper reaches of the South Nahanni River

Biostratigraphy and Sedimentology of Middle Cambrian Deep-water Deposits (Rockslide Formation), Mackenzie Mountains

The researcher studied half a billion year old rocks in the Mackenzie Mountains, chartering a helicopter from Watson Lake to install and move light-weight camps and bring back samples. The purpose was to understand what the ancient marine environment was like in this part of Canada. Outcrops in the Mackenzie Mountains preserve an almost uninterrupted sequence of strata of Cambrian age, sedimentary rocks some half a billion years old. This study aimed to collect in bed-by-bed detail samples containing fossils from the Rockslide Formation i.e. the Middle Cambrian portion of the sequence, exposed in the Backbone Ranges of the southern Mackenzie Mountains. The strata of interest are exposed on mountain sides in remote areas. Hand and brick sized samples were collected at measured intervals, labelled and placed in plastic sample bags. Samples were split or dissolved in the laboratory and fossils prepared, photographed and identified. The biostratigraphy of these fossils, based on the successive evolution of immigration of species, will generate a more refined relative time scale for this part of the geologic column. The results will aid in correlation of Cambrian rocks around the world and help us understand the evolution of the earth and this part of North America during this time period.

GEOLOGY

053 **Geology**

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Reference Number: 12 404 359
Region: IN **Location:** Mallik drill site, Richards Island

Mallik 2002 Gas Hydrate Production Research Project

The primary objectives of this study are to advance fundamental geological, geophysical and geochemical studies of the Mallik gas hydrate field and to undertake advanced production testing of a concentrated gas hydrate reservoir. A production research well program was carried out at the Mallik drill site, on Richards Island in the Mackenzie Delta. It included the drilling of a 1166 m deep main production research well and two nearby science observation wells. Full-scale field experiments monitored the physical behaviour of the hydrate deposits in response to depressurization and thermal stimulation. The observation wells facilitated cross-hole tomography and vertical seismic profile experiments as well as the measurement of in situ formation conditions. The science and engineering research program included the collection of gas-hydrate-bearing core samples and downhole geophysical logging. Laboratory and modeling studies documented the sedimentology, physical/petrophysical properties, geochemistry, geophysics, reservoir characteristics and production behaviour of the Mallik gas hydrate accumulation. This program was undertaken as a collaboration among nine partners (Geological Survey of Canada, Japan National Oil Corporation, GeoForschungsZentrum Potsdam, United States Geological Survey, United States Department of Energy, India Ministry of Petroleum and Natural Gas / Gas Authority of India, Chevron-BP-Burlington joint venture group, and International Scientific Continental Drilling Program project).

054 **Geology**

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Region: SA **Location:** southern part of the Sahtu Settlement Region, 128 30'W and 62 30'N

Resource Assessment of Emeralds in the Northern Cordillera: Parts of NTS 1051

This project was conducted to better understand emeralds. Emeralds were re-discovered near the Lened pluton in the southwestern Northwest Territories in 1997. This area has produced a number of transparent to translucent yellow-green beryl crystals up to 3.0 cm in length. Emeralds have also been discovered nearby at the Regal Ridge property, Yukon. This summer, researchers mapped and sampled rocks to find the components needed for the formation of emeralds. The beryllium can be attributed to a suite of Cretaceous granite plutons. In the case of the Lened showing, fluids from these plutons have followed a fault zone and altered the limestone of the Rabbitkettle Formation. Beryl is concentrated along the vein margins in the micaceous schist and in the white quartz. The colour of the Lened emeralds is provided by vanadium that has been stripped by the vein fluids out of the adjacent black shales of the Earn Group. At the Regal Ridge, the colour of the emeralds is due to traces of chromium that have been derived from nearby ultramafic volcanic rocks. The elements required to create emeralds are readily available in the Northern Cordillera and there are likely more deposits of these coloured gems in the NWT.

055 **Geology**

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Region: SA **Location:** Sahyoue

Non-renewable Resource Assessment (Initial Field Work Phase, Sahyoue)

The objective of the fieldwork was to further assess the non-renewable resource potential of the Sahyoue Candidate Protected Area as a follow-up to the completed Phase 1 assessment, which was based upon the review of existing data. Phase II fieldwork, carried out at Sahyoue during July and August 2002, consisted of stream sediment and rock sampling and bedrock examination. Stream sediment samples and rock chemistry do not reveal any significant anomalies. Three stream drainages display weak multi-element anomalies, but these are not interpreted to indicate base or precious metal mineralization. Heavy mineral concentrates from six major drainages showed that the sampled material is derived mainly from till that was transported onto the peninsula from the exposed Precambrian Shield to the east, rather than directly from the underlying formations. The number of gold grains in the samples was very low. Some kimberlite-source indicator minerals were recovered but are interpreted to be from a distant source, based on low concentrations. In general, the results do not indicate the presence of significant mineralization in the Sahyoue area. There is very little bedrock exposure at Sahyoue, comprising Upper Cretaceous shale on the northeast side of the peninsula and Ordovician-Silurian dolostone at Jupiter Point. Early Paleocene coal exposures were found on the east side of Sahyoue. The shale has good petroleum source rock potential but is immature, that is, not buried deep enough or long enough.

056 **Geology**

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Region: SA **Location:** Between MacMillan Pass and Plains of Abraham on the Canol Heritage Trail, about 150 km west of Tulita and Norman Wells

Long-term Ecological and Geomorphological Investigations in the Alpine Tundra of the Mackenzie Mountains

The objectives of this study were to determine the status of permafrost landforms in the study area along the Canol Heritage Trail and to determine the long-term recovery after abandonment of the CANOL No 1 project. The main activities were to retrieve data from the automated microclimate stations established in 1990; check the depth of thaw on selected features; recover data from miniloggers installed in 2001, and install new ones on selected Canol crude-oil spills in the vicinity of Camp 108; and to retrieve oiled soil samples from there for lab analysis. An additional four Canol crude-oil spills were instrumented with miniloggers to monitor soil temperatures and a total of 27 soil samples were collected for oil residue analysis. The soil samples have been analyzed and no further sampling is planned. The miniloggers deployed in 2001 and 2002 will be removed in 2003.

057 **Geology**

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Reference Number: 12 404 546
Region: IN **Location:** Peel Plateau Area

Bonnet Plume Basin, Yukon and Peel Plateau, NWT Aeromagnetic Survey, Phase V of Mackenzie Corridor Survey

During the summer of 2002, the Geological Survey of Canada (GSC) continued with the fifth phase of the multi-year airborne magnetic survey over the Mackenzie Corridor region of Yukon and the Northwest Territories. The survey was carried out over the Bonnet Plume Basin and the Peel Plateau area. The survey was entirely airborne with no land access, carried out on contract by Fugro Airborne Surveys Inc. Approximately 28,000 line kilometres of data were acquired and covered parts of NTS map sheets 106E, 106L and 106K. The purpose of this survey was to improve the public knowledge and understanding of the geology of this area, as no publicly available magnetic survey coverage exists. The survey recorded the variation in the earth's magnetic field caused by magnetic minerals contained in the rocks of the earth's crust. The patterns obtained are indicative of the subsurface geological structure and will be used as an important element of geological mapping and resource exploration. The survey was jointly funded by the GSC, Yukon and NWT. The GSC will be the primary source for information and public distribution of the raw digital data. The final results have been compiled and presented by the GSC in the form of colour Aeromagnetic Total Field and First Vertical Derivative Magnetic maps at a scale of 1:100,000.

058 **Geology**

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Region: IN **Location:** Dundas Peninsula, Liddoli Gulf, Murray Inlet

Quaternary Glacial Geology and Sea-Level History of Melville Island, Western High Arctic

This research is concerned with the nature and style of glaciation as well as sea level changes and past climatic changes. The broad objective of the research is to obtain a long term paleoclimatic record (before the arrival of the Pre-Dorset people) from these former ice conditions. It will also help to determine whether this scale of glaciation could happen again in the future or whether ongoing global warming will remove glaciers and sea ice from the Arctic high latitude areas. These areas provide diverse records of past global changes since they are generally the first regions to be affected by climate variability. Hence, it is of prime importance to obtain more data from these regions and to replace them in a context of much longer environmental changes in order to have a better understanding of possible future climate conditions.

059 **Geology**

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Reference Number: 12 404 312
Region: DC **Location:** Fort Liard and the La Biche River map areas

Central Foreland NATMAP Project

This project aimed to map bedrock and surficial geology in the study area, to provide a more accurate basis for making informed decisions about land use and resource potential. In 2002, the final year of the project, fieldwork was based out of Fort Liard. The work consisted of helicopter-supported as well as fly camp-supported ground traverses. Bedrock and surficial geology mapping was completed for the westernmost quarter of the Fort Liard map area (NTS 95B) and for the entire La Biche River map area (NTS 95C). Following the fieldwork, we focused on the production of paper maps and GIS products. This has resulted in the publication of 16 new geological maps at 1:50,000 scale, with 11 more currently in progress for the NWT portion of the project area. These will be followed by two new regional compilations at 1:250,000. The analysis of rock samples is continuing and will be reported in several scientific publications, once the analyses are completed. These data will enable us to better define the ages of some of the rock units, to better understand how and when the mountain belt developed, and, in particular, to understand how the mountain ranges developed their complex curved forms.

060 **Geology**

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Region: NS **Location:** south end of Kirk Lake and south western end of Walmsley Lake

Geological Bedrock Mapping in the Walmsley Lake Area, NTS 75N

The 2002 fieldwork commenced with traverses carried out on foot from base camps located on Cook, Murdock and Godspeed Lakes. The primary goals for this year were to complete ground coverage of the NTS map sheet. Structural and lithological data were collected on the traverses. Sampling was performed to determine economic potential, resolve structural problems, provide rock chemical compositions, and determine the absolute ages of the rocks. The 2002 program focused largely on igneous plutonic rocks (rocks intruded as a liquid into the Earth's crust). Three major igneous events are documented and appear to be similar in rock type and age to events documented near Yellowknife. Previously unknown areas of highly metamorphosed volcanic sedimentary rocks were found and documented during 2002 mapping. Highlights of the 2002 field program include delineation of a large mafic intrusive pluton, and an area of highly deformed gneiss between Lac La Prise and Artillery Lake. The highly deformed gneisses may prove to be significantly older than other rocks in the eastern Slave province. Three M.Sc. theses supported under the geological mapping component of the program are nearing completion. A final geology map and associated GIS compatible dataset covering all aspects of the study will be completed during the winter of 2002/2003.

061 **Geology**

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Reference Number: 12 404 594
Region: DC **Location:** road cuts between Hay River and Fort Simpson river gorges

Sedimentology and Stratigraphy of Upper Devonian Strata around Hay River

The objective of this research was to study the development of Devonian reefs, as exposed in areas and roadcuts between Hay River and Fort Simpson, so as to better understand the different types of reefs that grew in the area 370 million years ago, and how they formed large bodies of limestone.

In the summer of 2002, the project leader and one field assistant mapped locations of rock exposure at 46 localities between Enterprise and Heart Lake. Approximately 500 fist-sized samples were collected and approximately 200 photographs of geological features were taken. Field work was also conducted at sites along the Hay River between Alexandra Falls and Escarpment Creek. A couple of days were also spent working in the area of Lady Evelyn Falls, near Kakisa and along Trout River, near the campground. From this work, detailed geological maps will be produced, which show the nature of limestone in the area as well as fossilized reefal deposits. The collected samples are being examined to identify the different fossils present and the microscopic textures of the limestone. The results of the study have not yet been published, as the work is still in its early stages.

062 **Geology**

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Region: SA **Location:** Selwyn Basin, Mackenzie Mountains

Collaborative Research: A Sequence, Chemo- and Biostratigraphic Study of Late Early Cambrian Rocks, Southern Selwyn Basin, Mackenzie Mountains

During July 2002, field teams measured 8 stratigraphic sections and collected over 1000 rock samples from the Sekwi Formation in the area south and southeast of the Canol Trail. The research team collected trilobites, archeocyathans and a new species of soft-bodied organisms that will be identified for publications. These samples were placed into measured sections for correlating the stratigraphic sections and helping us determine if the radiation of these organisms and their subsequent extinctions were related to sea level rise and/or fall or climate variations. Correlations of this work with similar age rocks in western North America suggest that the radiation of new species occurs during sea level rises. However, it is still unclear what caused groups within these units to go extinct. Carbon isotopic samples were collected to determine the geochemical record of the ocean in this location. It appears that some of these isotopic fluctuations can be correlated globally and may record global-scale changes in ocean chemistry during this time. However, some of the fluctuations are not global and the researchers are working to understand how some of these local fluctuations develop and whether they may also have influenced organism evolution.

063 **Geology**

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Reference Number: 12 404 592
Region: IN **Location:** various sites in the Richardson Mountains (in the area of latitude 67 36' – 68 32' and longitude 135 27' – 136 42')

Examination of Selected Kamik Formation Outcroppings in the Richardson Mountains

The purpose of this research was to observe the distribution of sandstone within the Kamik Formation along outcrops in the Richardson Mountains in order to understand and model the distribution of sandstone in the Parsons Lake gas field, 2600 m below the surface of the Mackenzie Delta. The research team was composed of people from the Geological Survey of Canada, ConocoPhillips and the Gwich'in community. Of the three days allotted to this excursion, the first two were rained out. On the final day, the party visited four of the six top priority areas: they were unable to land at two sites due to thunderstorms in the area. The sites visited were: 1) Grizzly Gorge [UTM zone 8: 7572857N 470997W]; 2) Willow River [7564900N 482200W]; 3) Jurassic Butte [7545357N 480508W]; and 4) East Bear Creek [7525632N 466215W]. Most of the party's time was spent at Grizzly Gorge and Willow River. Six hand samples were collected from the lower sand (Kamik C) for microscope analysis at ConocoPhillips' offices in Calgary.

064 **Geology**

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Reference Number: 12 404 575
Region: DC, SS **Location:** Pine Point minesite, Southern shore of Great Slave Lake, Highways #1 and #2 south and west of Hay River

Potential for Carbonate-Hosted Lead-Zinc (Mississippi Valley Type) Occurrences in Northern Alberta and Southern Northwest Territories

The purpose of the project was to develop a stronger understanding of ancient hydrothermal fluid flow regimes (indicated by the formation of hydrothermal dolomite) and the subsequent concentrations of lead and zinc in the southern NWT. The field program involved the collection of core samples from the Pine Point core facilities (north and west of the former Pine Point townsite) and field mapping between Heart Lake (to the west) and Little Buffalo River (to the east). A two-person field camp was set up at the Twin Falls campground, the Polar Lake campground, and Paulette inlet. The results from the mapping project were presented in an oral presentation at the Yellowknife Geoscience Forum in November 2002, and are released in the following publication: Turner, W. A. and Gal, L. P., 2003. Regional structural data from the Hay River area, Northwest Territories, with emphasis on the Pine Point mining camp. Current Research 2003-C10, p. 10. http://www.nrcan.gc.ca/cgc/librairie/free/cr_2003/c10.pdf. The core samples were sent to the Geological Survey of Canada, Calgary office where they were examined and sampled for chemistry analysis. Chemistry studies are ongoing and are to be released as a Geological Survey of Canada Special Bulletin publication in 2004.

HEALTH

065 **Health**

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Reference Number: 12 408 122
Region: NS **Location:** Rae-Edzo

Health Behaviour in School-Aged Children Study (HBSC)

The purpose of the study was to increase understanding of the status and determinants of adolescent health in order to influence the development of effective policies and programs. The HBSC survey was developed by an international consortium of researchers in 32 countries. An international standard questionnaire enables the collection of common data across all participating countries and thus enables the quantification of patterns of key health behaviours, health indicators and contextual variables. Research into children's health and health behaviours and the factors that influence them is essential for the development of effective health education and health promotion policy, programs and practice targeted at young people. In accordance with the WHO perspective, it is important that young people's health is considered in its broadest sense, encompassing physical, social and emotional well-being. The aims of the study were: 1) to record changes in and gain new insights about the status of youths' health attitudes and behaviours; 2) to increase Canadian and international understanding about the health and lifestyles of young people; and 3) to use this information to influence the development and improvement of health promotion and health education programs in Canada and elsewhere. In Canada, the HBSC survey was given to at least 2000 students in each of the age groups of 11, 13, and 15 year olds (grades 6-10) from all provinces and territories. Only students with signed parental consent forms participated. Data from the Canadian questionnaires will be combined and incorporated into an international data set for statistical analysis. A report of Canadian findings will be published by Health Canada and a copy sent to each participating School Board.

066 **Health**

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Reference Number: 12 408 121
Region: All **Location:** Communities throughout the Northwest Territories

Canadian Youth, Sexual Health and HIV/AIDS Study

The Canadian Youth, Sexual Health and HIV/AIDS Study was designed to investigate the determinants of youth sexual health, especially with regard to HIV prevention. The objectives for the study were to: (1) Describe the relationships among determinants of health, adolescent sexuality, and the sexual health status of youth, including elements of income/social status, social support, social environment, culture, health services, health practices/coping skills, gender and sexual orientation; (2) Compare descriptive analyses of selected aspects of adolescent sexual health, especially in relation to HIV prevention, with the 1988 Canada Youth and AIDS Study; (3) Provide national and provincial/territorial data that inform policy and program development, and facilitate professional practice; and (4) Facilitate dissemination of the findings of the study. The research team interviewed students in Grades 7, 9 and 11 (generally ages 12, 14 and 16) from across Canada to examine the changes that occur in sexual health behaviours and attitudes at critical development stages in adolescence. Nationally, data was collected from a sample of 1150 students in each of Grades 7, 9 and 11. This questionnaire consisted of items developed to measure the study concepts that belong to the three major components of the conceptual framework (health determinants, sexuality variables, sexual health). Two age-specific versions of the questionnaire were developed. A version for Grade 7 students was used, and a single question was asked whether Grade 7 students have had sexual relations. Grade 9 and 11 students were given a more complete version of the questionnaire that explores sexual behaviours more fully. All information will be kept confidential. Children will not be identifiable in any documents from the research.

067 **Health**

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Reference Number: 12 408 124
Region: IN **Location:** Paulatuk

The Experience of Wellness/Being Healthy/Feeling Good in the Inuit Community of Paulatuk

Plans to transfer the responsibility of health services to Aboriginal peoples are well underway. It is intended that this transfer process will reflect the principles of primary health care, increased public participation and responsibility, community based programming, as well as more effective management of the health care systems. Success in the assumption of these new responsibilities will be enhanced as members of the Inuit population begin to assume greater responsibility for their personal and community health outcomes. Nurses, the providers of the majority of existing health care services to the Inuit population, assume an ideal position in terms of their opportunities to influence health promotion activities and programs. The current state of nursing knowledge does not support the provision of culturally appropriate health care to the Inuit population, as reflected in the lack of supporting literature. Epidemiological data, which reveal a high rate of illness and disease among the Canadian Inuit, may provide further evidence for the need for valid knowledge. Expanded understanding of the meaning of the wellness experience, as perceived by the Inuit, may encourage the development of culturally specific health programs that could lead to an overall improvement to the health of this population. A qualitative design has been selected to obtain descriptions of Inuit culture. The people of Paulatuk expressed a desire to present data in their own words. Data collection sources, in the form of unstructured interviews, field observations, and review of published literature pertaining to such issues as local history, were accessed. The information will be kept confidential unless participants provide consent for their names to be used.

068 **Health**

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Reference Number: 12 408 123
Region: All **Location:** Communities throughout the NWT

First Nations and Inuit Regional Longitudinal Health Survey

The information will work towards improving health status and health care delivery for First Nations and help their governments get a better long term picture of their community, region and country as the survey is carried out over 4 years. There are 3 age-specific survey instruments for adults (18 years or +), adolescents (12 to 17 years old) and children (birth to 11 years old) which holistically address priority issues in First Nations. Community participation was determined through community interest combined with random selection. All confidential surveys throughout the NWT were electronically sent to Yellowknife and then sent to the main National office in Ottawa for analysis. The Dene Nation hired one surveyor from each of the 14 communities surveyed. They also hired 2 data collection managers to assist communities in updating, starting a database for their community membership list and to ensure all information is sent to the National office. OCAP (Ownership, Control, Access and Possession) means that First Nations control the data collection processes in their communities. They own, protect and control how information is used.

PHYSICAL SCIENCES

069 **Physical Sciences**

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Reference Number: 12 404 584
Region: IN **Location:** Inuvik, Reindeer Station Region

Late Quaternary Hydrological and Climatic History of the Lower Mackenzie River Basin

The research team obtained sediment cores from a series of lakes near Reindeer Station in the Inuvik region for the purposes of reconstructing the hydrological, climatological and geomorphic history of the lower Mackenzie River basin. Lakes adjacent to the Mackenzie River floodplain are likely to be periodically inundated by flooding, and therefore contain sedimentary records of flood history. Several such lakes exist in the vicinity of Reindeer Station and sediment cores taken from these lakes should provide robust records of past flooding events. Radiocarbon dating was used to date flood event beds in the sedimentary records from these lakes, allowing reconstruction of the flood history of the Mackenzie River for the past thousand years or more. Sediment cores from higher elevation lakes on the bluffs east of Reindeer Station were used as controls to provide long-term climatic histories that can be used to refine and isolate the flood signal in the lower lakes, as well as reconstruct landscape stability with reference to permafrost. By looking at lakes, as well as analyzing changes in fossil remains and lake productivity, it is possible to identify changes in past landscape stability, as well as determine how these changes are related to regional climate and permafrost. These results can also be used to remove the climate signal in the lower lake records and isolate the flood signal with greater precision, as well as identify the effects of long-term changes in past climate on flood frequency. Coring of several lakes in the Inuvik region will also help the researchers' understanding of the past climate and glacial history of the area.

070 **Physical Sciences**

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Region: IN **Location:** Illisarvik, Garry Island, Richards Island, Inuvik area

Permafrost Investigations in the Western Arctic

This project examines permafrost conditions in the Mackenzie Delta area and how ground behaves due to the extreme temperatures of the region. The research team visited Illisarvik and Garry Island, where they observed snow thickness, ground temperature, ice-wedge cracking, active-layer depth, and ice-wedge movement. They visited several lakes near Illisarvik and measured ice thickness, snow cover and bottom water temperature. Grass was cut from an area in Illisarvik the size of several tennis courts in order to reduce the snow depth and cool the ground. At a study site near the airport in Inuvik, breaking cables were installed across several ice wedges to determine whether they are actively cracking. Five papers on the research conducted in the western Arctic have been published in 2002. Material written for the Western Arctic Handbook project was published in two books: the *Western Arctic Handbook* and *Natural History of the Western Arctic.*

071 **Physical Sciences**

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Region: IN **Location:** South of Paulatuk

Wind-abraded Rocks near Paulatuk

The wind-abraded rocks south of Paulatuk are among the best examples of ventifacts in North America. These rocks have smooth, lichen-free surfaces on their south side, which is blasted by sand and snow during strong southerly winds that are frequent at the site in winter. There are hundreds of these rocks, of different sizes and rock types; some are as big as a motor vehicle. The researchers are trying to determine the extent to which these rocks and the pebbles near them have been altered over the last 50 years and determine the rate at which sand is blown away from the area and accumulates in the sea or closer to the community. In 2002, the research team gathered data on the amount of vegetation on either side of the rocks, and on the orientation of small blocks that were placed at the site in 2001. These had been moved over the previous winter. Photographs were taken of all 157 rocks studied by Dr. Ross Mackay in 1967 so that the changes that have occurred to the rocks since then may be described.

072 **Physical Sciences**

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Reference Number: 12 404 591
Region: IN **Location:** Banks Island and Victoria Island

Paleoecology of Mercy Bay Reefs, Frasnian, Banks Island

The Devonian patch reefs of Mercy Bay, Banks Island are important as an example of fossil coral reefs that grew in a siliciclastic environment on a broad continental shelf. These reefs may also be able to provide insight into the nature of a reef ecosystem immediately before a time of global reef collapse. These reefs have been described qualitatively, but have not been studied using modern paleoecological methods. This study re-examined the detailed structure, sedimentology, and paleoecology of these reefs. The structure and composition of the Mercy Bay reefs were compared with lower Middle Devonian reefs on the Princess Royal Islands and the adjacent western shore of Victoria Island, Middle Devonian reefs of southern Canada, and modern reefs on siliciclastic shelves.

073 **Physical Sciences**

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Reference Number: 12 404 590
Region: DC, SA, IN **Location:** Mackenzie River banks from Jean Marie River to Point Separation

Reconstructing Holocene History of the Mackenzie River Valley from Fluvial Sediment Records, Fort Simpson to Arctic Red River

The objective of this study was to reconstruct the post-glacial history of the Mackenzie River from sedimentary exposures along riverbanks, shallow geophysical investigations and carbon dating. Unfortunately, due to logistical and technical problems, the project was grudgingly dismissed after a month and a half of work. The team performed geophysical surveys (Ground Penetrating Radar and Electroresistivity Ground Imaging) on sandbars along 170 km of river upstream from Point Separation (Delta), however, neither technique succeeded. First, large amounts of silt embedded between sand grains on the bars greatly attenuated the Ground Penetrating Radar signals to the point where it was unusable. Second, the silt rich water body (the river) around the sandbars distorted the Electroresistivity signals. Logistically, we realised that our boats were too heavily loaded and could not transport enough gas to reach the next upstream gas station. Finally, we found fewer significant sedimentary exposures than expected and the main ones were out of reach from the boats. Although the project was dismissed, the fieldwork had positive fallouts. We now have a better understanding of the strengths and limits of the geophysical tools used in this project and acquired significant field experience in remote environments.

074 **Physical Sciences**

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Reference Number: 12 404 595
Region: IN **Location:** Melville Island

Water Quality Assessment and Climate History of Selected Ponds and Streams on Melville Island

The overall goals of this research were to more fully understand the present-day water quality of arctic lakes and ponds and to determine if the water quality of these sites is changing as a result of, for example, recent climatic change. The 2002 field season involved collecting water quality data from ponds and lakes on Melville Island. Melville was chosen because it is a large and geologically varied island that has received little attention with respect to freshwater ecosystems. Water, sediment, algal and zooplankton samples were gathered from 46 ponds, of which 34 were in the Northwest Territories. The sites were chosen to cover a wide environmental gradient (e.g., size, proximity to the coast, vegetation, geology), and ranged in latitude between 74°N and 76°N and in elevation from 0 to 655 m above sea level. One sediment core was retrieved. Preliminary results indicate pH ranged from 6.8 to 8.8 (average close to 8). Conductivities ranged from 5 to 1230 µS. Water samples were sent to the National Water Research Institute in Ontario for other chemical analyses (e.g., nutrients and trace metals). These data will be used to quantitatively correlate dominant species to measured limnological variables, and subsequently used to interpret the climatic and environmental history of the region using sediment cores.

075 **Physical Sciences**

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Reference Number: 12 404 555
Region: NS **Location:** Tundra Ecosystem Research Station, Daring Lake

Tundra Hydrology and Chemistry, Daring Lake

The objective of the 2002 summer fieldwork was to quantify the surface water hydrology and chemistry in a sub-basin of the Daring Lake catchment (64° 52' 12"N, 111°35'6"W). Peregrine Basin consists of two distinctive physiographic units: a topographically flat lower basin and several upper ponded sub-basins. The fieldwork included the installation of instruments, followed by a program of monitoring. Drive point piezometers, groundwater wells, thermisters and soil moisture probes were installed at sites deemed representative of larger parts of the basin. Water level recorders were installed in the principal stream at the lower end of the basin and part way up the basin, as well as at the discharges of two of the upper sub-basins. The latter sites were frequently gauged for discharge using a stream gauge. Bail tests were conducted on the piezometers; and soil moisture and temperature readings were recorded frequently. Water samples were extracted from piezometers, water wells and the stream at irregular intervals. More frequent sampling occurred during storm events, which included three large rain storms and one smaller one. Conductivity and pH measurements were done with calibrated instruments at the Tundra Ecosystem Research Station lab; other analyses were carried out later at Wilfrid Laurier University (ionic chemistry) and University of Waterloo (isotopic chemistry). Measurements of active layer development were done using steel poles along with numerous probed depths at each site to establish confidence in the depth of permafrost. On occasion, the sites were excavated to determine if the measured active layer depth was real.

076 **Physical Sciences**

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Region: IN **Location:** Beaufort Sea region

Air Quality and Noise Studies Program for the Proposed Beaufort Sea Offshore Drilling Program

Devon Canada Corporation (Devon Canada) is intending to initiate an offshore oil and gas exploratory drilling program in the Beaufort Sea region in the winter of 2004/2005. Drilling is anticipated within Devon Canada's Exploration Licence 420 (EL 420), with ten proposed drilling targets being identified. The ten drill targets have been labeled as Kekertak, Nayak South, Pullen North, Kidluit, Tuwak, Minuk East, Omat, Nipterk North, Paktoa and Tiggak. With the exception of Kidluit, which is located onshore, all drill targets are located within the landfast ice regime in water depths that range between 6.8 and 12.2 m (Devon Canada 2002). In 2002, no fieldwork was conducted in relation to the baseline evaluation of air quality and noise levels within EL 420.

077 **Physical Sciences**

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Reference Number: 12 404 598
Region: IN **Location:** Beaufort Sea region

Physical Oceanography, Geotechnical Parameters, Ice Environment, Coastal Processes and Chemical Oceanography Studies for the Proposed Beaufort Sea Offshore Drilling Program

Studies of the physical oceanography of the Beaufort Sea and coastal processes were carried out to gather information for use in the development of a Comprehensive Study Report and regulatory submissions for Devon Canada's Beaufort Sea offshore oil and gas exploratory drilling program. Concentrations of hydrocarbons and metals in seawater, sediments and biota were obtained at sites near ten proposed drill targets and compared with historical data. Metals were detected in all samples at levels within the range of previously reported data. There was little to no variation of contaminants in fish with respect to capture location. Surficial sediments suggest no significant recent input of petroleum. The coastal processes investigations focused on shoreline erosion and accretion, shoreline materials, and the movement of sediment along these shorelines. Sites visited were on Pelly, Hooper, Pullen, Summer, North Head, and Reindeer Islands. Exact locations were determined using GPS, and conditions were photographically documented. Shoreline profiles were surveyed from approximately 0.6 m depth offshore to the crest of cliffs, where present. Overall, the results indicate little change in the average erosion rates over the past 50 years.

078 **Physical Sciences**

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Reference Number: 12 404 399
Region: IN **Location:** mainland coast and Mackenzie Delta area, Banks Island and Victoria Island

Coastal Hazards, Relative Sea-Level Change and Climate Impacts on Northern Coasts and Seaways

Climate warming in the western Arctic is associated with rising sea levels and ground temperatures, decreased sea ice thickness and extent, and increased open-water wave energy. These changes are expected to result in increased thaw subsidence and accelerated coastal erosion, and storm-surge flooding may increase. During 2002, a continuous global positioning system station was established at Sachs Harbour to complement stations set up in 2001 in Inuvik and Holman and Resolute, Nunavut. Preliminary results indicate subsidence at Holman and Inuvik, implying that the area of rising sea level may extend farther east than previously thought, with important implications for coastal vulnerability in the Holman and Paulatuk areas. Also in 2002, the Geological Survey of Canada coastal monitoring network was expanded to Banks Island. Oblique airborne video imagery was obtained for the west coast and part of the south coast of Banks Island. Monitoring continued at Tuktoyaktuk and Holman. Additional work documented early summer storm surge flooding and erosion on the outer Mackenzie Delta, with serious implications for swan reproduction in 2002. High-resolution satellite imagery was obtained for Tuktoyaktuk and west central Banks Island, but planned acquisition in the Sachs Harbour and outer Delta areas was thwarted by bad weather. Satellite data were combined with ground-truth observations to support analysis of goose and swan nesting habitat in collaboration with Canadian Wildlife Service. The project also supported installation of a new tide gauge at Holman and is encouraging efforts to revive the tide gauge at Tuktoyaktuk.

079 **Physical Sciences**

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Region: IN **Location:** Mackenzie Shelf / Amundsen Gulf region

Canadian Arctic Shelf Exchange Study (CASES)

The primary objective of the fall 2002 CASES expedition was to study the biological production and physical characteristics of the Mackenzie Shelf/Amundsen Gulf region before the winter freeze-up. A team of 34 researchers sampled more than 110 stations in the study area from onboard the CCGS *Pierre Radisson*. Continuous profiles of temperature, salinity, light transmittance, fluorescence, oxygen and pH were conducted from bottom to surface at all stations. Activities at selected stations also included measurements of dissolved organic and inorganic carbon, nutrients, chlorophyll *a*, viral and bacterial densities, physiological rates of microorganisms, plankton net tows for the determination of zooplankton and juvenile fish densities, deployment and recovery of floating sediment traps, boxcoring of sediments, large-volume pumping for contaminants and thorium profiles, ice algal sampling and helicopter surveys for satellite validation of the snow-ice fields. As the ship moved through the study region, atmospheric conditions, heat and gas fluxes and contaminant levels were monitored continuously. Building on this highly successful expedition, the main thrust of the CASES program will be the 2003–2004 one-year over wintering of the newly refitted and equipped Canadian research icebreaker, starting in September 2003.

080 **Physical Sciences**

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Region: IN **Location:** Lousy Point

The Testing of Surface Geophysical Technique for the Detection of Ice-bonded Permafrost

A capacitive-coupled resistivity survey was conducted during March 2002 across permafrost terrain in the Mackenzie Delta. The survey was done using a recently developed capacitive-coupled resistivity system using dipole-dipole spacings of 10 to 100 m in order to obtain a two-dimensional resistivity image of the subsurface. There was good correlation between this survey and the first capacitive–coupled resistivity survey in the Mackenzie Delta, which was conducted in 1992. Inversion of the resistivity image has been useful in developing a geological model from which permafrost condition can then be interpreted.

081 **Physical Sciences**

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Reference Number: 12 404 597
Region: IN **Location:** Workshop Point, Loch Point, West Richard Collinson Inlet, East Richard Collinson Inlet and South West Richard Collinson Inlet

Younger Dryas and Postglacial Threshold Events in the Western Canadian Arctic

The objectives of this study were to establish: 1) the end of the last glaciation flows on northwest Victoria Island, by examining the landforms left by the moving ice; and 2) the changes with time in the nature of the postglacial raised sea, mainly by dating (radiocarbon method) fossil shells and driftwood found in the raised beaches. The survey was completed between Workshop Point (112°W) and Peel Point (114° 30'W). Small (50 gram) samples of marine shells and some larger pieces of driftwood were collected from raised beach deposits. The ages of these will be determined in various laboratories. This will provide the researchers with an estimate of the time at which ice of the last glaciation left the area (probably 10 000 years ago). It should also provide some information on changes in climate from that period up to the present. Fifty-two archaeological sites were located. These sites can be divided into four general categories including a musk-ox kill site (1), caches (8), remains of structures from both the Palaeo- and Neoeskimo Periods (32), and stone features with unknown function (11). The location of these sites was recorded and the general characteristics of the sites documented by photography and sketches. Only four artifacts were observed on the surface and these artifacts were photographed, however, no artifacts were collected. Fourteen charcoal samples were collected from hearth features and some of these will be dated in order to assist with dating the postglacial history of the area and to determine when Palaeoeskimo peoples used the area.

082 **Physical Sciences**

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Reference Number: 12 404 554
Region: NS **Location:** Snare River project area, between Wekweti and Rae

The Snare River Mapping Project: Parts of NTS 850 and 85N

This project was conducted during the summer of 2002 in the Snare River area. Mapping was done on Strutt Lake, unnamed lakes between Ghost Lake and Wheeler Lake and an unnamed lake 10km east of Cowan Lake. The geological work entailed walking across the land, mapping the rocks and collecting samples of the outcrops. Sampling was mainly done with small handheld rock hammers. Mapping from river or lake shorelines on boats was done as much as possible. Reports pertaining to the geological findings of the project were presented at the 2002 Geoscience Forum held in Yellowknife.

083 **Physical Sciences**

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Near-surface Ground Ice in Sediments of Mackenzie Delta Region

This project investigates the physical and chemical characteristics of near-surface ground ice in sediments of the Mackenzie Delta area. A relationship has been established between ground ice and vegetation type indicating that vegetation communities may be used to predict the amounts of near-surface ground ice in sediments of the Mackenzie Delta. Field data also suggests that ground ice development influences spruce forest succession in the Mackenzie Delta, through the tilting and eventual toppling of trees. Near-surface ground ice was investigated at Navy Road near Inuvik where active layer development has been documented since the late 1960s (Mackay 1995). The record of active layer history has enabled the investigation of near-surface ground ice development over decadal time scales. In addition, results indicate that the ice-rich zone is nutrient-rich relative to the base of the active layer and that nutrient accumulation is linked to water movement in freezing soils. The geochemistry of near-surface permafrost may indicate the potential impact of climate warming and active layer deepening on the chemistry of soils and surface water.

084 **Physical Sciences**

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Reference Number: 12 404 567
Region: DC **Location:** Mirror Lake

Using Tree Rings and Lake Sediment to Reconstruct Streamflow and Climate in the Northwest Territories

The objective of this study was to supplement and extend climatological and hydrological records using dendrochronology (tree-ring) and lake sediment analysis. Research was conducted in the Mirror Lake catchment, approximately 7.5 km north of Tungsten. Small diameter cores were collected from approximately 90 black spruce trees in the catchment, which has resulted in the creation of a 336-year chronology of temperature fluctuations in the area. Using canoes, lake bathymetry was mapped and sediment cores were collected. Bathymetry was determined using a sonar fish finder and a global positioning system (GPS) unit. Five surface cores (less than 20 cm in length) were collected from the lake bottom using weighted plastic pipe (approximately 7 cm in diameter). Two long cores (154 cm and 201 cm in length, respectively) were obtained using a percussion coring system, which involves pounding a metal pipe into the sediment using a weight controlled by ropes. Water column properties (i.e., salinity, turbidity and temperature) were recorded by lowering a Sequoia LISST-100 particle size analyzer from the lake surface to the bottom, using a rope to control the instrument's movement. Continuing laboratory analysis suggests that the sedimentary record from Mirror Lake shows annual increments (i.e., contains varves). Preliminary results indicate that a chronology spanning at least 200 years exists in the sediment and together with the tree rings, this record will be further examined to document past climate change.

085 **Physical Sciences**

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Region: IN **Location:** Mackenzie Delta in the vicinity of Inuvik

Biogeochemistry of Lakes in the Mackenzie Delta

The long-term goal of this ongoing project is to develop a biogeochemical model for lakes in the Mackenzie Delta, and ultimately, a more general ecosystem model for lakes in the floodplains and deltas of major world rivers that could help assess the effects of multiple stresses on rivers as a result of global change. Specific goals included investigating how the gradient in nutrient quantity and dissolved organic carbon, which changes in concert with lake flooding frequency, affects abundance of bacteria and zooplankton. A second goal involved investigating how the zooplankton community structure among lakes affects heterotrophic microflagellate abundance. During a 1-month field season (July), 24 lakes were surveyed for bacteria, phytoplankton, zooplankton, heterotrophic microflagellates, and water chemistry. Laboratory experiments were completed that clarified how the consumption of microflagellates by zooplankton depended strongly on the zooplankton species present. Results from earlier work have been submitted for publication in *Canadian Journal of Fisheries and Aquatic Sciences*. An internet web page summarizing our recent work on the Mackenzie Delta has been posted at http://www.sfu.ca/limnology.

086 **Physical Sciences**

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Region: IN **Location:** Inuvik area

Snow Accumulation / Runoff in High Latitude Permafrost Basins

Field studies were conducted in the Inuvik area during 2002, looking at the factors controlling the movement of energy and water between the land surface and the atmosphere during the spring snowmelt period. These factors control both the supply of energy and water to the atmosphere, as well as snowmelt and therefore spring runoff in the streams and rivers. The long term objective is to improve the ability to predict weather, climate, and water resources. With future uncertainties in climate, and with potential development projects, such improved predictive ability is essential in order to properly manage future environmental change and to adapt to such changes. The researchers' work in 2002 concentrated primarily on measuring total basin snowfall (by the middle of April), as well as automated measurements of solar radiation, air and ground temperatures and summer rainfall. Ongoing work will compare results from different years so that the variation from year to year can be understood and results can be compared from areas on either side of the tree-line. This work provides important data needed to test computer models, which are used to predict the impact of climate warming on these environments. In addition, the researchers have been analyzing the timing and magnitude of spring breakup in the Mackenzie Delta since the mid 1960s. This work has clearly shown that the date of spring breakup has changed dramatically, with breakup occurring some 2 to 3 weeks earlier than in the 1960s, while there has been no observed changes in the magnitude of the spring peak water level.

087 **Physical Sciences**

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Reference Number: 12 404 248
Region: IN **Location:** 400 km north-northwest of Tuktoyaktuk

PITSA (Pack Ice Thickness – Station A)

This project established a baseline climate-monitoring site in the perennial ice zone of the Canada Basin. Mooring carrying instruments to measure thickness of drifting perennial pack ice was kept at Station A on the 3000-m isobath in the Canada Basin. The mooring consists of an anchor at the seafloor and a long buoyed line extending to within 50 m of the ice at the surface. Instruments were spliced into the upper part of the line to measure temperature and salinity of the water, speed and direction of the ocean current and thickness and movement of the ice. Transponders and beacons were spliced into the lower part of the line to allow relocation and recovery of the instruments and mooring line following a 2-year deployment. Data from this site will provide answers to the following important questions: what is the magnitude of seasonal and interannual variability in pack-ice thickness; what are the periods of dominant interannual variability; what is forcing the variability; what trends can be distinguished and what is their cause; and how can we improve our understanding through synthesis of observations and modeling results?

088 **Physical Sciences**

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Reference Number: 12 404 398
Region: DC, SA, IN **Location:** 60 sites from Fort Simpson to Beaufort Sea coast

Active Layer Monitoring Network in the Mackenzie Valley

During July and August 2002, the 12th annual survey of the active layer monitoring system in the Mackenzie Valley was completed from Fort Simpson to the Arctic coast. About half of the 56 sites are in the Mackenzie Delta. The active layer, which overlays permafrost, forms the interface between permafrost and the atmosphere and biosphere; its thickness, texture and moisture content influences vegetation and soil conditions, and also affects foundation conditions for transportation and construction. Along this 1400 km transect, active layer thickness varies more as a result of local factors related to situation than to regional climate associated with latitude. Though both air temperature and ground thawing degree-days increase from Arctic through Sub-arctic to Boreal environments, active layer development is surprisingly similar, except where local factors override regional patterns. The thaw of 1998 was the greatest yet recorded, in keeping with record warm temperatures. The thaw in 1996 north of Norman Wells and in 2000 at many sites was notably less than adjacent years, and was associated with lower temperatures and significantly shorter seasonal lengths than normal. The widespread response to these events builds confidence in the utility of the instrumentation for measuring response in the ground to atmospheric change. In the longer term, measurements from this transect will be used to help model climate change impact on the near surface permafrost in this fragile environment.

089 **Physical Sciences**

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Reference Number: 12 404 583
Region: IN **Location:** Town of Inuvik lands within the Gwich'in Settlement Area

Ambient Air Quality Study in the Vicinity of Inuvik: Gwich'in Settlement Area

Imperial Oil Resources, Conoco Canada Resources Limited, Shell Canada Limited, and ExxonMobil Canada initiated a number of Biophysical Baseline Studies during 2001-2002 as part of a feasibility study for the Mackenzie Delta Gas Opportunity. This ambient air quality program in Inuvik was conducted east of the town, at a fixed location that is between the proposed northern terminus facility and the settlement. Passive monitoring equipment was installed in August 2001 to measure monthly values of sulphur dioxide (SO_2), nitrogen dioxide (NO_2), nitrous oxide (NOX) and ozone (O_3). Passive monitoring consists of the collection of air samples by permeation through a membrane. After each month, the sample media were shipped to a qualified laboratory where they were analyzed for SO_2, NO_2, NOX and O_3. The program duration in Inuvik was 12 months, ending in August 2002. Ambient concentrations of SO_2, NO_2 and NOX were all below 5 ppb while O_3 concentrations were between 12.7 and 36.5 ppb.

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Reference Number: 12 404 583
Region: IN **Location:** Parsons Lake Lease area and Taglu Lease area

2002 Baseline Air Quality Volatile Organic Compound (VOC) Monitoring Program in the Taglu and Parsons Lake Production Areas

Baseline monitoring of volatile organic compounds (VOCs) was conducted on two occasions in the Parsons Lake Lease and on two occasions in the Taglu Lease between September and December 2002. Samples were collected using SUMMA canisters, which are specialized stainless steel containers each fitted with a pressure valve and containing a vacuum. Each canister was opened manually and a sample of ambient air was drawn into the device for a period of one hour. After the sample was collected, the valve was closed and the container was sent to a certified laboratory for analysis of select VOCs. VOC monitoring was conducted by a crew of two individuals, one of whom was an Inuvialuit assistant. Analyses indicated very low levels of some VOCs, and the remainder were at levels that were too small to be detected by the analysis equipment.

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Region: IN **Location:** east of Inuvik

2002 Baseline Noise Monitoring Program in the Gwich'in Settlement Area

Baseline noise monitoring was carried out in the Gwich'in Settlement Area in early December 2002 by HFP Acoustical Consultants Corp. under contract with TeraAGA Consulting Group, as part of the Mackenzie Gas Project. The monitoring equipment included a sound level meter, a digital sound recorder, a portable weather station, and a propane fired thermo-electric generator. Access was by helicopter. Noise monitoring was conducted by a crew of three individuals, including a Gwich'in assistant. The equipment was set up near the site of the potential Inuvik compressor site. It was then left alone until it was retrieved the next day. The observed sources of noise at this site were the Inuvik airport and the wind.

092 **Physical Sciences**

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Reference Number: 12 404 583
Region: IN **Location:** Niglintgak, Taglu, and Parson's Lake leases in the Mackenzie Delta

2002 Baseline Noise Monitoring Program in the Inuvialuit Settlement Region

Baseline noise monitoring was carried out in the Inuvialuit Settlement Region in 2002 by HFP Acoustical Consultants Corp. under contract with TeraAGA Consulting Group, as part of the Mackenzie Gas Project. Noise monitoring was conducted by a crew of three individuals, including an Inuvialuit assistant. The monitoring equipment included a sound level meter, a digital sound recorder, a portable weather station, and a propane fired thermo-electric generator. Monitoring was conducted at two sites, each of which was accessed by helicopter. The equipment was set up near Parsons Lake, where it was left for three days. The observed sources of noise at this site were the wind and one occurrence of skidoo noise. The equipment was set up near the proposed Niglintgak production site where it was left for two days. The only observed source of noise at this site was the wind.

093 **Physical Sciences**

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Region: SS, IN **Location:** Slave Delta, Mackenzie Delta, and Fort Resolution

Paleohydrological and Paleoecological Reconstruction of the Mackenzie Basin Deltas

The objective of this project is to formulate a comprehensive history of the frequency and magnitude of floods and droughts and corresponding ecological responses in the Peace-Athabasca Delta, Slave Delta and Mackenzie Delta over the past 1000 years, using physical, biological and geochemical information preserved in lake sediment cores. In September 2002, reconnaissance water and sediment sampling was performed at three river locations and 41 lakes in the Slave Delta. Measurements included maximum lake depth, water transparency, pH, conductivity, and surface water temperature. Lake and river water samples were obtained for analysis of stable isotope composition, major ions, dissolved organic carbon, nutrients, and total suspended solids. Sub-samples of lake surface-sediment (upper 1 cm) were obtained for analysis of moisture, organic and carbonate content, diatoms, plant macrofossils, and stable isotope geochemistry. At two of the 41 lakes, 20-30 cm sediment cores were obtained for paleoenvironmental analysis. The cores will be analyzed for the same suite of indicators as the surface-sediment. It is anticipated that results from the sediment core analyses will provide preliminary 200-300 year records of past hydrological and ecological change in the Slave Delta. During the field visit, a presentation, which included a broad overview of the research program and objectives, was given to the Fort Resolution Environmental Committee. Slide shows of the field work, as well as lab tours and classroom visits at Deninoo School were offered so that the students could see first-hand the variety of samples collected, learn about the research, and discuss career opportunities in the natural sciences.

SOCIAL SCIENCES

094 **Social Sciences**

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Reference Number: 12 410 583
Region: ALL **Location:** Communities throughout Northwest Territories

Youth in Transition Survey

The Youth in Transition Study (YITS) describes the transitions Northwest Territories (NWT) youth experience, and the factors and support/services that affect transitions. The YITS engaged NWT youth as well as youth-serving agencies in discussions about transitions. The NWT Department of Education, Culture and Employment (ECE) led the YITS on behalf of the federal-territorial Canadian Rural Partnership (CRP). Lutra Associates Ltd. of Yellowknife undertook the research under the guidance of ECE and CRP. The YITS research involved 466 NWT individuals who participated in a survey of youth, focus group meetings with front-line workers and community leaders and/or youth. The YITS also involved a review of existing research into youth transitions. Participating communities represent a cross-section of youth environments. The YITS identified an essential set of ten skills and attributes that are needed to help NWT youth achieve successful transitions. These are: 1) self-awareness, esteem and confidence; 2) motivation, ambition, and a desire to succeed; 3) adaptability, flexibility and openness; 4) cultural identity and values; 5) communication, interpersonal and coping skills; 6) independence, responsibility and self-reliance; 7) strong personal and family relationships and healthy lifestyles; 8) necessary job skills including team work and decision making; 9) a strong work ethic; and 10) understanding, trust and respect.

095 **Social Sciences**

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Region: SA **Location:** Fort Good Hope, Tulita, Norman Wells and Deline

Evaluating Co-management: a Framework for Analysis

The main objectives of this study were to: 1) develop criteria to assess co-management processes; 2) conduct an in-depth analysis of the Sahtu co-management regime in terms of its management strategy, the manner in which policy is formulated, and the role participants play in the process; and 3) apply the criteria to the Sahtu Renewable Resource Board (SRRB) in an attempt to further develop the overall evaluation process, provide recommendations and insight to the co-management board, and provide recommendations to resource management practitioners and academics on a framework for evaluating co-management regimes. As part of the 2002 field season, the researcher visited all five communities in the Sahtu region and, where possible, spoke with a representative from each of the Renewable Resource Councils, the Metis/Dene Councils, and the Métis/Dene Land and Financial Corporations. The findings of this study, as well as the recommendations to the SRRB are based on interview data and preliminary feedback, along with supplementary information. The findings and recommendations are presented in both the researcher's academic thesis and community report.

096 **Social Sciences**

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Region: SA **Location:** Sahtu Settlement Communities

Sahtu Settlement Harvest Study

The Sahtu Settlement Harvest Study is a five year, five community study required under the Sahtu Land Claim Agreement. The study counts the number of fish and wildlife harvested by Sahtu, Dene and Métis to establish their minimum needs and to obtain information for use in natural resource management in the Sahtu. In September 2002, a community interviewer was hired in Fort Good Hope. Changes were made to the wall calendar this year by adding more photo pictures. It was another successful year for the photo contest. During the SRRB meetings in Fort Good Hope in 2002, the Working Group made recommendations to the Board to continue the Harvest Study in Deline until they complete the five year study. The Board approved the recommendations. Harvest study data collection for Norman Wells, Tulita, Fort Good Hope and Collville Lake is expected to be complete by the summer of 2003 (up to and including April 2003). Data collection should continue in Deline until December 2003 to make up for the eight months missed during the initial year of the Study. In addition to annual summaries of preliminary data collection, a final report and harvest data product is expected to be available to all study partners by December 2004.

097 **Social Sciences**

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Region: IN **Location:** Aklavik, Holman, Paulatuk, Sachs Harbour, Tuktoyaktuk, and Inuvik

Socio-economic Study for the Proposed Beaufort Sea Offshore Drilling Program

A socio-economic study was conducted to gather information for use in the development of a Comprehensive Study Report and regulatory submissions for Devon Canada's Beaufort Sea offshore oil and gas exploratory drilling program. The study area was defined as all communities situated within the Inuvialuit Settlement Region (Aklavik, Holman, Paulatuk, Sachs Harbour, Tuktoyaktuk, and Inuvik). The economies of these communities can be described as twenty-first century Arctic mixed economies. All communities sustain significant traditional economies, have monetary economic activity dominated by employment in government services and tourism, and look forward to some hydrocarbon industry prospects. Separate sections of the report deal with regional economy and political organization, demographics, labour force, economic activity by sector, income, health and well-being, protection services and facilities, social service programs and facilities, family concerns, community conditions and concerns, education and training, community infrastructure and utilities, and physical infrastructure. The primary source of information is statistical data provided by the Government of the Northwest Territories and Statistics Canada, as well as material compiled by other government agencies and material reported in other consulting studies. In addition, the study team verified quantitative information and conducted qualitative research through personal interviews with selected knowledgeable individuals and visits to each community in the study region and the territorial capital of Yellowknife.

098 **Social Sciences**

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Region: IN **Location:** Fort McPherson

Gwich'in Settlement Region Heritage Resources Project

As part of her Ph.D. project, the project leader is working in collaboration with the Gwich'in Social and Cultural Institute (GSCI) to examine the question of how the Gwich'in define heritage resources in a way that reflects their own worldview. Most of the research is being conducted in the community of Fort McPherson, where the project leader has been residing since July 2002. Two different sets of interviews with elders have been carried out in order to collect information concerning how the Gwich'in regard the concepts of heritage, heritage resources and heritage management and whether they have management procedures of their own. Data concerning the kinds of places the Gwich'in wish to protect on the land has also been gathered. This information will contribute to the development of a draft heritage policy that will assist the GSCI to fully assume its role as caretaker of heritage places and objects on behalf of all the Gwich'in of the Northwest Territories. The project leader is also working with the GSCI and Parks Canada on a project aimed at identifying a particular place the Teetl'it Gwich'in would like to propose for national historic site designation. A meeting with a community steering committee was held in Fort McPherson in November 2002 and three potential places were selected for designation. A community consultation process was then initiated and a final decision about the place that will be submitted for designation will be made by the community steering committee in 2003.

099 **Social Sciences**

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Region: DC **Location:** Sambaa K'e (Trout Lake)

Sambaa K'e Dene Band: Traditional Practices in Contemporary Sport, Games, and Physical Activity Contexts

The intent of this project was to study Dene women's involvement in sport, games, and physical activity, as well as the impact of menstrual traditions on these activities. Women in Sambaa K'e reported that the underlying reason why women do not typically participate in many traditional games, especially hand games that involve a moose hide drum, revolves around menstrual traditions and notions of purity/pollution. Men's hunting abilities are said to be adversely affected if menstruating women have contact with them, while women's contact with a drum, even when not menstruating, is said to have the same effect. Though all female interviewees reported that they would not play hand games in the community if they were menstruating, they were unsure of what they would do if they were selected for the Arctic Winter Games and were menstruating while there since there would be a large incentive to compete. The games will have a Junior women's category for the first time ever in 2004. The semi-structured interviews brought forth a wide variety of opinions concerning past and present traditional games practices as well as notions of tradition, thus suggesting that there is no such thing as "the" Dene perspective. Research is currently continuing in Jean Marie River to further the investigations into women's involvement in traditional games.

100 **Social Sciences**

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Region: IN, NS **Location:** Inuvik, Paulatuk, Sachs Harbour, Holman and Yellowknife

Northern People and Northern Knowledge: A Virtual Museum on the Canadian Arctic Expedition of 1913-1918

In September and October 2003, the researcher completed a 5-week trip to the Western Arctic to gather new material for a Virtual Museum of Canada exhibit on the Canadian Arctic Expedition of 1913-1918. He visited six northern communities in the general area covered by the Expedition (Inuvik, Paulatuk, Sachs Harbour, Holman, and Yellowknife, plus Kugluktuk in Nunavut) and interviewed 36 Elders and 19 younger people with links to members or employees of the Expedition. Several sites visited by the Expedition were re-visited and artifacts and places associated with the Expedition were documented. Seven public and four school presentations on the Canadian Arctic Expedition and the Virtual Museum Project were given during the trip. The exciting new information (including video-tapes of interviews, photographs, specimens, and artifacts) has been incorporated into the developing website. The virtual exhibit will feature 3-D images of some specimens, video clips of Elders, sound clips of recordings made in 1916, and over 200 photographs, both archival and modern. The virtual museum exhibit is expected to be online at www.virtualmuseum.ca in the fall of 2003.

101 **Social Sciences**

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Region: SA **Location:** Deline, Sahyoue on Great Bear Lake, and surrounding area

Leadership Capacity and Cultural Landscape Management: an Aboriginal Case Study from Canada's Sub-Arctic

Sahyoue and Edacho are two cultural landscapes on Great Bear Lake, designated National Historic Sites because of their importance as repositories of Sahtuotine culture. Their long term cultural integrity will depend on the role that the Sahtuotine of Deline can bring to their management. In this action research study, the researcher clarifies what the Sahtuotine want that role to be. This research is based on a field trip to Sahyoue with fifteen elders, youth, and guides to understand the cultural importance of these lands to the Sahtuotine. The group hiked traditional trails and listened to stories from Elders. Also included are findings from interviews with community leaders about developing the leadership capacity to manage these lands. The findings are that culture is land to the Sahtuotine, so the protection of culture requires the protection of land. Leaders will therefore require an awareness of Sahtuotine culture that includes on-the-land experiences. To attract and retain leaders, however, will also require land-related employment opportunities such as cultural tourism. Sahyoue and Edacho are crown lands outside Sahtuotine jurisdictions so community leaders are seeking decision making powers for these lands and the consolidation of funding for land-related programming and long term planning.

102 **Social Sciences**

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Region: SS **Location:** Hay River

Literacy Advancement in Knowledge Forum® Databases

This project used student standardized reading scores in conjunction with written work from three student project (Knowledge Forum®) electronic databases to determine spelling and vocabulary improvement. The purpose is to determine how Knowledge Forum® (a computer mediated communications software program) supports literacy advancement. The study attempted to correlate the literacy score results between those students who participated in activities using Knowledge Forum® and those who had not. The purpose was to identify whether certain aspects of learning with Knowledge Forum® might enhance student literacy skills and to develop a rationale which supports the data. Age and grade level were the only indicators used to describe student participants. The educational implications this research may provide could be of future benefit to elementary students in the area of literacy improvement throughout the South Slave Region.

103 **Social Sciences**

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Region: DC **Location:** Fort Simpson and other Deh Cho communities

Social Suffering and Self Government in the Northwest Territories

This research was conducted as part of a PhD program at Cambridge University, England. It focused on self government negotiations and how these are set up to meet and further government interests instead of Indigenous interests. The research was conducted with the Fort Providence Métis Council, the Dene Nation, the Northwest Territories (NWT) Aboriginal Summit, and by observing various public self government negotiations and Indigenous political processes in the NWT. The result of the research will be a PhD dissertation, which is being written between June 2003 and March 2004. It will be an ethnography of self government negotiations, describing negotiation processes with an emphasis on the relationship between negotiations and social suffering. One of the main reasons Indigenous peoples are involved in self government negotiations is to improve peoples' lives. Many people experience suffering brought about by intergenerational and ongoing colonization and its effects; for example, unemployment, poverty, and poor health conditions. Negotiations provide a place where suffering brought about by colonial practices is used by government as a rationale to continue colonization, and is used by Indigenous negotiators as a rationale for self determination. The research shows how what is commonly called "social dysfunction" is actually colonial suffering; how the way current self government agreements are structured have the potential to solidify the political causes of social suffering; and how suffering in itself is evidence of Indigenous peoples' ongoing rejection of colonial domination and practices. The research will also show how Indigenous political, financial, and cultural strategies can successfully frustrate colonial practices and thereby prevent or end social suffering.

104 **Social Sciences**

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Region: NS **Location:** Rae-Edzo

Dogrib Dictionary Project

This project examined syllables in Dogrib, especially consonants and vowels. The research team collected words and sentences by interviewing consultants and tape recording their answers. The research was conducted in the community of Rae-Edzo. Any information of linguistic forms gathered through the research became part of the dictionary database and part of the larger collection of written material in Dogrib. Work with syllable will aid in the dictionary project because it will clarify how vowels are being used which will in turn contribute to understandings of spelling. This research will increase the dictionary database by adding pairs or sets of words which are very similar in pronunciation, yet distinct in meaning. This research was done in context with the Dogrib Language committee, which works to promote and maintain the strength of the Dogrib language and literacy.

105 **Social Sciences**

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Reference Number: 12 410 584
Region: SS **Location:** Thebacha Campus, Fort Smith

Thebacha Campus: An Examination of a Learning Community

The purpose of this research project was to examine a learning community by collecting the insights of the Thebacha Campus community through an appreciative framework. The target population were academic staff members working at one campus of a community college. Condidates were invited to participate in the study through an email request. Participation involved semi-structured interviews. After the interviews, participants met together to form a focus group. Through discussions and collaboration, the participants arrived at common themes that were used to clarify and enrich the data. The results of the study are being analyzed to determine: 1) what elements in a community exist at the campus; 2) what processes for building community/building teams exist at the campus; 3) what climate conditions did they appreciate; and 4) what climate would they like to have present at the campus. The findings of the study will be used to suggest changes, alternatives, or improvements to current climate conditions to build interpersonal capacity for a learning community.

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Reference Number: 12 410 581
Region: DC **Location:** Wrigley, Fort Simpson, Jean Marie River, Trout Lake, Kakisa

2002 Socio-economic Studies in the Deh Cho Region

Socio-economic baseline studies were undertaken in all communities in the Deh Cho Region as part of a feasibility study for the Mackenzie Delta Gas Opportunity. Studies included data collection on governance, regional economy, labour force activity, demography, regional and community infrastructure, community services, land and resource use, education facilities and health and social services. For the traditional knowledge study, however, the study area included only Wrigley, Fort Simpson, Trout Lake, Jean Marie River and Kakisa. Work was undertaken with appropriate regional and community organizations to develop a detailed methodology for completing traditional knowledge studies. Presentations on the "Cooperative Approach Document" were made to Liidlii Kué First Nation, Fort Simpson Metis Local #52 and Jean Marie River First Nation. The remaining communities within the traditional knowledge study area were contacted to discuss the process for completing traditional knowledge and socio-economic studies. Socio-economic baseline data were collected, verified and reported on, including information on: the local/regional wage and subsistence economies, population, labour force, community facilities, services, accommodation, local/regional infrastructure, community health, wellness and social indicators. Community officials and local service providers were asked to validate information from secondary sources.

107 **Social Sciences**

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Region: IN **Location:** Inuvik, Aklavik, Tsiigehtchic, and Fort McPherson

2002 Socio-economic Studies in the Gwich'in Settlement Area

Socio-economic baseline studies were undertaken in the Gwich'in Settlement Area (Inuvik, Aklavik, Tsiigehtchic, and Fort McPherson) in 2002 as part of a feasibility study for the Mackenzie Delta Gas Opportunity. Studies included data collection on governance, regional economy, labour force activity, demography, regional and community infrastructure, community services, land and resource use, education facilities and health and social services. Work was undertaken with appropriate regional and community organizations to develop a detailed methodology for completing traditional knowledge studies. Several meetings were held with the Gwich'in Tribal Council (GTC) and the Gwich'in Social and Cultural Institute (GSCI) to discuss the process for completing traditional knowledge and socio-economic studies. Socio-economic baseline data were collected, verified and reported on, including information on: the local/regional wage and subsistence economies, population, labour force, community facilities, services, accommodation, local/regional infrastructure, community health, wellness and social indicators. Community officials and local service providers were asked to validate information collected from secondary sources.

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2002 Socio-economic Studies in the Inuvialuit Settlement Region

Socio-economic studies were undertaken in the Inuvialuit Settlement Region (Inuvik, Aklavik, Tuktoyaktuk, Paulatuk, Sachs Harbour, and Holman) in 2002 as part of a feasibility study for the Mackenzie Delta Gas Opportunity. Studies included data collection on governance, regional economy, labour force activity, demography, regional and community infrastructure, community services, land and resource use, education facilities and health and social services. Work was undertaken with appropriate regional and community organizations to develop a detailed methodology for completing traditional knowledge studies. Presentations on the "Cooperative Approach Document" were given to the Hunters and Trappers Committees (HTCs), Community Corporations and Elders Committees in Aklavik, Inuvik and Tuktoyaktuk, as well as the Inuvialuit Regional Corporation, the Inuvialuit Cultural Resource Centre (ICRC) and the Inuvialuit Game Council. The HTCs, Community Corporations and Elders Committees agreed to participate in the traditional knowledge study and selected Working Group members. ICRC was consulted on the development of the study methods. Maps of the preliminary pipeline route, granular resources and other infrastructure were presented to community organizations in November. Socio-economic baseline data were collected, verified and reported on, including information on: the local/regional wage and subsistence economies, population, labour force, community facilities, services, accommodation, local/regional infrastructure, community health, wellness and social indicators. Community officials and local service providers were asked to validate information collected from secondary sources.

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Reference Number: 12 402 670
Region: SA **Location:** Fort Good Hope, Norman Wells, Deline, Tulita, and Colville Lake

2002 Socio-economic Studies in the Sahtu Settlement Area

Socio-economic studies were undertaken in the Sahtu Settlement Area (Fort Good Hope, Norman Wells, Deline, Tulita, and Colville Lake) in 2002 as part of a feasibility study for the Mackenzie Delta Gas Opportunity. Studies included data collection on governance, regional economy, labour force activity, demography, regional and community infrastructure, community services, land and resource use, education facilities and health and social services. Work was undertaken with appropriate regional and community organizations to develop a detailed methodology for completing traditional knowledge studies. Presentations on the "Cooperative Approach Document" were given to the Behdzi Ahda' First Nation Band, Ayoni Keh Land Corporation, Deline Band Council, Deline Land Corporation, K'ahsho Got'ine Community Council, Yamoga Land Corporation, Tulita Dene Band Council, Tulita District Land Corporation and Ernie McDonald Land Corporation. All five communities appointed representatives to a regional Working Group. Department of Resources, Wildlife and Economic Development, the Sahtu GIS Unit and the Sahtu Land Use Planning Board were contacted numerous times to discuss the process for completing traditional knowledge and socio-economic studies. Socio-economic baseline data were collected, verified and reported on, including information on: the local/regional wage and subsistence economies, population, labour force, community facilities, services, accommodation, local/regional infrastructure, community health, wellness and social indicators. Community officials and local service providers were asked to validate information collected from secondary sources.

110 **Social Sciences**

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Reference Number: 12 410 575
Region: SS **Location:** Fort Smith

Integrating Elders Experience of Past, Present and Future: Implications for Community Institutions

The objective of this study is to understand the process and the strategies whereby Aboriginal elders in the community of Fort Smith have engaged in responding to historical events in the twentieth century. The research ran into unanticipated obstacles in the community licensing process that has delayed the completion of the work intended for this period. During July the researcher was present in Fort Smith for ten days. Preliminary work to set up the interviews, attendance at a Métis elders conference, and some work on collaboration with a similar project sponsored by the Cree Language program (GNWT) was completed. Archival research involving the gathering of photos to be used in the interviews was conducted at the Provincial Archives in Alberta. Formal interviewing was conducted during stays in Fort Smith in August and October. Data were transcribed, analyzed and rechecked with participants.

111 **Social Services**

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Reference Number: 12 410 592
Region: IN **Location:** Inuvik, Aklavik, Holman, Paulatuk, Sachs Harbour, and Tuktoyaktuk

Development of a Strategy to Engage Inuvialuit Youth in Oceans Stewardship

This study was designed to gather information about past and present youth involvement and ways to involve youth in oceans stewardship activities. The findings of the study include the following: 1) Youth participation in traditional activities has decreased over time, however, there were no clear trends of youth involvement in the recent past or present. There has been a rise in participation in formal oceans activities due to increased opportunities. 2) Traditional knowledge is seen as crucial. There is a lack of value of formal education. However, if youth wished to pursue an oceans related career then both knowledge sets are important. 3) Elders, parents, and schools have the primary responsibility to teach youth about oceans. 4) There is poor communication between organizations, which has resulted in competition between programs and conflicts between organizations. 5) Resource management professionals have a pessimistic attitude towards youth. 6) There is a lack of awareness of opportunities for youth to get involved in oceans stewardship and of ocean related careers. 7) Social issues such as drugs and alcohol etc. prohibit youth from getting involved in activities. 8) Youth would like to have hands-on participatory experiences.

112 **Social Sciences**

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Region: IN, NS SS **Location:** Inuvik, Aklavik, Rae Edzo, Yellowknife, Fort Smith, and Hay River

Building Capacity: Aurora College Teacher Education Program Review

This review of the Aurora College Teacher Education Program was initiated by Aurora College, in conjunction with the Department of Education, Culture and Employment, to pursue the possibility of providing opportunities for northerners to complete the Bachelor of Education degree in the Northwest Territories. This review includes a needs assessment, extensive program review and a delivery plan. It was formulated through extensive consultation with approximately 240 stakeholders, students, alumni, and College personnel, and a thorough document analysis. An interim report was submitted to Aurora College in May 2002 and, after extensive feedback, the final report, *Stream to River: Strong Current Teacher Education*, was prepared. The final report suggests that the Teacher Education Program needs to be reconnected with its glorious and trail blazing past if it is to remain relevant amid the changing social, political, and economic context of the Northwest Territories. The "strong current" river metaphor is a reminder of the hazards of ignoring the natural processes and Aboriginal origins that have guided northern Aboriginal education and society for centuries. It is also a reminder that to remain current, the Teacher Education Program must live productively between past glories and present realities. For this reason, the report urges reform and restructuring measures that will allow "strong current" teacher education to flourish in the Northwest Territories.

113 **Social Services**

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Region: NS, IN **Location:** communities in the North Slave and Inuvik regions

Foster Family Training Needs

This study focused on foster family training as it pertains to content, format, audience, delivery mode, trainers and scheduling. The collected data were analyzed and assisted in the formulation of 20 recommendations that were forwarded to the Department of Health and Social Services (DHSS). The recommendations will be instrumental in future planning and designing of standardized foster family training program. The first five recommendations speak to the importance of developing a strong cornerstone on which to build the training program. The DHSS needs to develop a vision, philosophy, guiding principals, purpose and goals of the program, along with a budget that realistically captures the long-term costs of a territorial training program. The remaining recommendations speak to training itself. Participants were clear in stating they want training to be culturally responsive to the people being served. They also believe that training should encompass pre-training and in-service training that should be offered to foster families and social workers. Joint training offers a positive way in which foster parents and social workers can interact in an informal way. The research found that trainers should have knowledge and experience working with children in the foster care system and in teaching adult education methods. It is recommended that a trained foster parent co-facilitate pre-service training. Foster families have unanimously expressed the need for flexibility in scheduling of the training offered. They believe that training should occur in their own community or in their region. Training should not occur in the summer or seasonal holidays. Most participants in the research expressed experiential methods of learning such as discussions, videos, lectures, case studies, role-playing, and other international experiences. It is imperative that the training program has an evaluation component that addresses increased learning and consumer satisfaction. It is hoped that the implementation of the recommendations will be an inclusive process, comprising of foster families, frontline social workers, foster family coordinators at the Authority level, and the DHSS.

TRADITIONAL KNOWLEDGE

114 **Traditional Knowledge**

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Reference Number: 12 410 588
Region: IN **Location:** along the Dempster Highway, in the Husky River and Tree River areas

Bush Medicine: Plants Used for Medicine by Northwest Territories Gwich'in at Husky River, Tree River, and along the Dempster Highway

Traditional knowledge about the medicinal uses of plants by Gwich'in people of the Northwest Territories was collected as part of an ethno-botanical research project. A Gwich'in Elder and plant specialist, Ruth Welsh, travelled with Gwich'in students in the Gwich'in Settlement Area during July 2002. They identified 112 plants at Husky River on the Peel River, Tree River on the Mackenzie River, and at Rock River, Eight Mile, and Tsiigehtchic along the Dempster Highway. Ms. Welsh prepared and explained the medicinal uses of 50 plants. These were recorded on video tape. Also recorded were Gwich'in place names related to plants; biographies of the lead researchers; and Tsiigehtchic elder, Hyacinthe Andre, telling a spruce gum story and raven stories that included spruce gum, birch bark and moss. Photographs of plants were taken. Gwich'in students transcribed interview tapes, added plant names to a master plant list, helped prepare plant medicines, researched plant names from reference books, and duplicated interview and video tapes. One student drafted a table of plants that included their English, Gwich'in, Latin, and other names, parts used for medicine, medicinal uses, method of preparation and application, and location where it is found.

115 **Traditional Knowledge**

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Reference Number: 12 410 568
Region: IN **Location:** Fort McPherson and on the land in the Gwich'in Settlement Area

Gwich'in Settlement Area Heritage Resources Project

The first part of this project was a study related to heritage resources and resource management. 14 Teetl'it Gwich'in elders were interviewed. The elders were encouraged to discuss where they and their parents had traveled on the land and what it meant to be a Teetl'it Gwich'in. They were also invited to talk about places that were important to them, their family and community, how these places were kept or regarded in the past and how they should be cared for presently. A policy for the management of heritage places and objects is being developed. The second component consisted of putting forward a new designation for a National Historic Site within the traditional land use area of the Teetl'it Gwich'in. A committee of 12 elders and youth was formed to select a place, person or event that was an important component of Teetl'it Gwich'in heritage. One of the places identified will be submitted to the Historic Sites and Monuments Board. The third component was a rafting trip down the Wind River and Peel River, sponsored by the Canadian Parks and Wilderness Society, Yukon Chapter, to raise awareness for the conservation of the Peel River Plateau. Two elders in Fort McPherson were interviewed for their knowledge of the area and for possible place names that could be located in future projects. An afternoon spent searching for Windy City was unsuccessful; future investigation of sites in the area would be best conducted by air.

ARCHAEOLOGY PERMITS

116 **Archaeology**

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Reference Number: (NWT Archaeologists Permit #2002-921)
Region: IN **Location:** Outer Mackenzie Delta

Mackenzie Delta Heritage Project (2002)

The Prince of Wales Northern Heritage Centre has a long-standing project aimed at locating, excavating and monitoring archaeological sites in the outer Mackenzie Delta that are threatened by erosion and industrial activities. Most of the known archaeological sites in this area reflect Inuvialuit activities, and include the remains of large winter villages of driftwood and sod houses. More ancient Paleo Inuit sites also are found in this area, usually as small surface sites.

One of the objectives of the 2002 fieldwork was to test the applicability of ground penetrating radar (GPR) for detecting subsurface cultural features in frozen ground. Relying on excavations to test likely areas for archaeological sites that are buried in permafrost is time-consuming, and such testing usually is impossible if land based industrial activities that might threaten archaeological sites occur in winter. The intent of this aspect of the field program was to determine the effectiveness of GPR as a relatively quick, non-intrusive tool for archaeological site reconnaissance. Researchers from the University of Calgary took a large number of GPR readings on a buried house feature at the Pond site (NiTs-2), and on a midden deposit at the Kuukpak site (NiTs-1). Preliminary results of their investigations show that GPR can detect architectural features, such as driftwood walls and floors, at a depth of several meters, and can profile the depth and thickness of buried midden deposits in the frozen ground at those sites.

A second objective of the 2002 fieldwork was to obtain a sample of faunal materials from an undisturbed midden associated with the remains of a driftwood and sod house at Kuukpak that had been excavated some years previously. The sample will be used to augment the faunal analysis of the Kuukpak site that is being undertaken by Matthew Betts, a graduate student at the University of Toronto, as part of his dissertation research, and will also be used in a contaminants research program that is being undertaken by the PWNHC and the University of Calgary. Matthew Betts directed this part of the fieldwork. Myrna Pokiak, a resident of Tuktoyaktuk who is completing her undergraduate degree in anthropology at the University of Fairbanks, assisted him.

Test excavations also were undertaken at NiTr-6, a small site several miles downstream from Kuukpak. Oral histories suggest that pre-contact period Inuvialuit villages at the mouth of the East Channel were periodically re-located downstream in response to ongoing silt deposition in the river bed, which made the waters adjacent to the villages too shallow for hunting beluga whales, a primary source of food source for the Inuvialuit. Radiocarbon dating at a series of archaeological sites in the study area supports this notion. NiTr-6 contains the furthest downstream village remains known along the east coast of Richards Island. A sample of terrestrial mammal bone obtained from the test excavations at NiTr-6 will be radiocarbon dated in order to determine whether the site conforms to the pattern of downstream relocation of settlements.

117 **Archaeology**

Bussey, Jean
Points West Heritage Consulting
Langley, BC

Reference Number: (Northwest Territories Archaeologists Permit 2002-918)
Region: NS **Location:** North of Lac De Gras

Archaeological Investigations Conducted North of Lac De Gras in the NWT

For the ninth consecutive year, Jean Bussey of Points West Heritage Consulting Ltd. directed archaeological investigations for BHP Billiton Diamonds Inc. in its claim block north of Lac de Gras. Carol Rushworth of Points West assisted, as did a number of summer students working at the Ekati Diamond Mine™. The fieldwork consisted of an archaeological inventory as well as a tour of archaeological sites associated with the Ekati Diamond Mine ™ and the Tibbitt to Contwoyto winter road. The first tour involved elders from Lutsel K'e, Madelaine Drybones and August Enzoe, along with their researcher/interpreter, Nancy Casaway. The second tour involved Inuit elders, Tom Kopak and Walker Bolt, and their researcher, Amanda Niptanatiak. In addition, previously recorded sites near development areas were revisited as part of an ongoing monitoring program.

During the archaeological inventory, thirteen new archaeological sites were discovered, bringing the total number of known sites in the BHP claim block to 183. Stone tools or the fragments (flakes) removed during the manufacture of stone tools characterize the thirteen new sites. The majority of the artifacts are typified by white or grey quartz, but some chert and siltstone specimens were also discovered. The majority of recorded sites in the claim block are associated with eskers, but sites are also found on other terrain types, usually in the vicinity of the larger lakes. Nine of the sites found in 2002 were associated with two eskers, locally referred to as the Duchess West and Exeter eskers. The other four sites were found near the Lac de Gras – Lac du Sauvage narrows, where eight other sites have been recorded. No development activity has been identified in the vicinity of these thirteen sites; thus, there is no potential for conflict.

The twelve sites in the vicinity of the Lac de Gras-Lac du Sauvage narrows are likely associated with caribou hunting since the narrows represents an important caribou crossing. One of the four new sites in this area yielded a number of small chert tools suggestive of the Arctic Small Tool tradition. This is the third site at the narrows with such tools. The presence of these artifacts is strongly suggestive of the narrows representing a significant location through time. There is high potential for additional archaeological sites in this vicinity.

118 **Archaeology**

Bussey, Jean
Points West Heritage Consulting
Langley, BC

Reference Number: (NWT Archaeologists Permit 2002-919)
Region: NS **Location:** Tibbitt to Contwoyto Winter Road

Archaeological Investigations Conducted along the Tibbitt to Contwoyto Winter Road

A researcher of Points West Heritage Consulting Ltd. directed archaeological investigations for a Joint Venture Project involving the Tibbitt to Contwoyto (formerly the Lupin) winter road. This was a continuation of work initiated in 2001. Robert Lackowicz, representing Points West, and Frank Basil (Lutsel K'e First Nation) and James Lafferty (North Slave Metis Alliance) assisted with field investigations. The fieldwork consisted of a combination of monitoring, site protection, site testing and mitigation. In 2001, 55 new archaeological sites were recorded and 14 previously recorded sites were revisited. Six of these sites are in Nunavut and the remainder are in the NWT. In 2002, a number of the sites and portages were viewed during tours conducted with elders. The first tour involved elders from Lutsel K'e, Madelaine Drybones and August Enzoe, along with their researcher, Nancy Casaway. The second tour involved Inuit elders, Tom Kopak and Walter Bolt, along with their researcher Amanda Niptanatiak.

Monitoring involved revisiting all sites within 30 m of winter road related development activities and some of those between 30 and 100 m of such activity. In addition, a number of the sites located more than 100 m from development areas were either revisited or examined from the air to confirm their condition. No new disturbances were identified at any of the sites in the vicinity of the Tibbitt to Contwoyto winter road.

It was determined during analysis of the data collected in 2001 that 13 intact archaeological sites were within 30 meters of existing disturbances associated with the winter road. Markers consisting of rebar and/or wooden survey stakes were erected at four of these sites to ensure that road related activities would not impact sites during the winter of 2002-2003. In addition, a fifth site located more than 30 m from disturbances associated with a small gravel pit was partially staked in the event that expansion of this borrow area is required in the future. This protection measure was selected over more permanent forms of barriers because of the isolated locations of these sites.

Investigations at LcNs-133 and KkNv-12 were limited to additional surface examination since the former had been previously mitigated and there was no evidence of archaeological material at the latter. Subsurface testing was conducted at eight sites near the winter road, including one of the staked sites. Sparse quantities of buried cultural material were noted at LcNs-137 and LcNs-142 and more substantial buried deposits were evident at LcNs-138 and LcNs-139. No buried archaeological material was encountered in the testing at LcNs-140, LcNs-141 and LcNs-145. Systematic surface collection was undertaken at all, but two sites. LcNs-145 was not collected since it is no longer threatened now that the gravel pit it is located adjacent to has been abandoned. LcNs-139 was judged to be too large and too complex to adequately mitigate through testing and surface collection. LeNs-27 is larger than originally identified and limited surface collection was undertaken, along with subsurface testing, but only the portion near the roadwork area was adequately mitigated; other intact portions are sufficiently distant. Avoidance of LcNs-138, LcNs-139, LcNs-140, LcNs-145 and LeNs-27 is the preferred alternate and has been recommended. It was not feasible to stake most of these sites, but their locations have been recorded and will be identified to those involved in road planning. LcNs-137, LcNs-141 and LcNc-142 have been adequately mitigated through a combination of surface collection and subsurface testing and no further archaeological investigation is required.

119 **Archaeology**

Clarke, Grant
Golder Associates Ltd.
Calgary, AB

Reference Number: (NWT Archaeologists Permit #2002-916)
Region: IN, SA, DC **Location:** proposed natural gas project study corridor and facility sites from the Mackenzie Delta to Alberta border

Mackenzie Gas Project Assessment

In the summer and fall of 2002, archaeologists with TeraAGA (a consortium of Tera Environmental Ltd., AMEC Earth and Environmental Ltd., Golder Associates Ltd. and Kavik-AXYS Environmental), conducted a focused reconnaissance of select portions of a proposed natural gas project, including a pipeline study corridor from the Mackenzie Delta to the Alberta border. Some potential granular source and infrastructure locations were also inspected during the course of investigations. The project area includes the Niglintgak, Taglu and Parsons Lake gas fields and the proposed pipeline corridor, which begins at the fields in the Inuvialuit Settlement Region and passes through portions of the Gwich'in Settlement Area, the Sahtu Settlement Area and the Deh Cho Region. All aspects of the fieldwork were conducted with the help of local assistants. Due to the scale of the project, encompassing a corridor in excess of 1400 km in length, technicians from eight communities in the vicinity of the project assisted with the reconnaissance.

There were three distinct components of the field program: the gas fields, the potential pipeline corridor and potential granular source and infrastructure locations. No definitive right-of-way for the pipeline had been determined at the time of the field program, but a one kilometre wide corridor had been selected by the Project team to encompass all of the environmental and heritage studies for 2002. The investigations of this corridor are currently being used to refine the selection of the final right-of-way location. The corridor was inspected by helicopter to confirm areas of high archaeological potential that had been previously determined on map based studies. Field crews investigated areas that were deemed to be of high potential within the corridor. A number of known site locations were also revisited. Granular source locations included areas that are potential borrow site locations for materials necessary for construction. Infrastructure locations included possible barge landing sites, plant facilities, construction camp locations and access roads. The granular source and infrastructure locations were also inspected by air to determine their potential for heritage resources as well as some field inspections of locales that exhibited high potential for heritage sites. Surface and subsurface testing was conducted in both the corridor and granular/infrastructure investigations.

The results of the program were positive for yielding archaeological information. A total of 93 heritage resource sites were investigated during the course of the program. These include a wide variety of site types and ages. Sites visited during the course of the field investigations include 18 precontact period assemblages, 69 historic/contemporary period assemblages and six locales of palaeontological material. The material from precontact period sites is primarily comprised of stone flakes and other debris remaining from stone tool manufacturing. No temporally diagnostic stone tools were recovered during the field investigations. Historic period sites primarily relate to traditional land use practices and include numerous trails, traps, tent and cabin locations, but sites relating to early communication, transportation, and oil and gas exploration are also present. Palaeontological sites were predominantly fossil marine shells, although one locale of a previously collected mammoth tooth was also revisited.

120 **Archaeology**

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Reference Number: (NWT Archaeologists Permit 2002-924)
Region: IN **Location:** traditional land use area of the Teetl'it Gwich'in

Teetl'it Gwich'in Archaeology Project, 2002

In August of 2002, the Gwich'in Social and Cultural Institute (GSCI) in partnership with the Prince of Wales Northern Heritage Centre (PWNHC) and the Teetl'it Gwich'in Council initiated a community-based archaeology project within the traditional land use area of the Teetl'it Gwich'in. The researcher was hired by the GSCI to conduct the study. The objectives were threefold: (1) to carry out a two-week excavation at a site (MiTu-1) located within the community of Fort McPherson; (2) to educate youth about archaeology and their own history through practical experience; and (3) to survey a few potential sites including Nataiinlaii (Mhtu-2) and the place where the trading post (Old Fort, MhTu-1) was first built before being moved to the present location of Fort McPherson.

The excavation in Fort McPherson took place between the 12th and the 28th of August. In total, seven youth from the community took part in the project. All of them were assigned their own unit of excavation and were responsible to excavate it, record the artifacts and the faunal material they encountered, and screen all the sediment taken out of their unit to ensure that no cultural remains had been overlooked.

The area excavated was the place where the Teetl'it Gwich'in used to camp in the second part of the 19th century and the early 20th century when coming to the fort to trade with the Hudson's Bay Company. Besides many animal bones, which belonged mostly to fish, muskrat, beaver, caribou and moose, the remains encountered include many Euro-Canadian artifacts such as nails, cartridge cases, pottery and glass fragments, numerous beads and one gun flint. Gwich'in-made artifacts found at the site consisted of several bone and antler spear points, a needle or awl made out of antler, and a few chert and quartzite flakes. The occupants of the site also recycled several glass fragments to make scrapers and cutting tools. Evidence of hearths was found within all of the units excavated, and a few cooking rocks were also collected. The presence of a significant amount of decayed/decaying wood suggested that there might have been a structure of some sort standing at the site.

Finally, no cultural remains were collected at Nataiinlaii and the Old Fort, despite the oral history attached to both of these places and the historical records that confirm that a trading post existed at the Old Fort for less than a decade around the mid-nineteenth century.

121 **Archaeology**

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Reference Number: (NWT Archaeologists Permit 2002-926)
Region: IN **Location:** Mackenzie Delta

2002 Mackenzie Delta Heritage Resource Survey

Bison Historical Services Ltd. and Inuvialuit Environmental and Geotechnical Inc. carried out a survey of heritage sites in the Mackenzie Delta on behalf of: Chevron Canada Resources, Conoco Canada Resources Limited, Devon ARL Corporation, EnCana Corporation and Petro-Canada. Previously known sites were re-visited to ensure that they had not been damaged by last winter's activities. Researchers also examined proposed well sites, access roads, and seismic lines on behalf of Devon, EnCana and Petro-Canada to ensure their upcoming winter projects would avoid known and newly identified heritage sites.

Fieldwork was based out of Tuktoyaktuk and carried out by helicopter and on foot. The work was located inland, south of Tuktoyaktuk, on Richards Island and in the vicinity of Parson's Lake. Researchers did not excavate any materials at any sites and no artifacts or other materials were collected.

Forty-two known sites, including ancient graves, villages and camps, were re-visited to evaluate avoidance. The accuracy of locations recorded in 2001 was found to be high. One site, a recently abandoned komatik recorded in 2001, could not be re-identified. No other sites have been damaged by last winter's exploration activities. However, natural erosion at several sites is an on-going concern.

New programs that were examined included: the proposed Petro-Canada Nuna access roads and well-sites, the Devon SDL62 access road and well-site, and the EnCana 2D seismic program in the vicinity of Richards Island and Parsons Lake. One new site was identified during the examination of the Petro-Canada Nuna project. No sites were identified in connection with the Devon SDL62 program. Twenty previously un-recorded sites were identified and twenty-six previously identified sites were re-visited during our examination of the EnCana seismic program. Newly identified sites included: graves, ancient campsites and traditional land-use locales. EnCana's planned development was re-designed to avoid all heritage sites. All previously known and newly identified heritage sites will be avoided by the proposed Petro-Canada Nuna access roads and well-sites, the Devon L47 access road and well-site, and the Encana 2D seismic program in the vicinity of Richards Island and Parson's Lake.

122 **Archaeology**

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Ottawa, ON

Reference Number: (NWT Archaeologists Permit 2002-925)
Region: DC **Location:** Fort Simpson

Fort Simpson Heritage Park Archaeological Site Testing

In 2000, Tom Andrews of the Prince of Wales Northern Heritage Centre in Yellowknife carried out limited testing at the Fort Simpson Heritage Park, where the Fort Simpson Historical Society hopes to relocate a heritage building, which demonstrated that archaeological deposits did in fact exist there. As a result, additional work was required in order to better evaluate the potential significance of these remains. It has also been suggested that the site of Fort of the Forks, a North West Company post dating to 1803, was located somewhere on, or near, the Park. It was with this in mind that a small crew of volunteers carried out archaeological fieldwork in the Fort Simpson Heritage Park during the 2002 field season. The project was sponsored by the Fort Simpson Historical Society, supported by the Prince of Wales Northern Heritage Centre and the Canadian Museum of Civilization.

Four 3 m x 50 cm test trenches were laid out in such a way as to expand upon the results of the 2000 investigation, leading to the recovery of artifacts and features that provide a much better idea of some of the events that have taken place within the Heritage Park over the last two centuries or more. The upper 30 cm of soil showed that there had been serious disturbance, probably a result of ploughing at the beginning of the 20th century, which completely mixed 19th and 20th century artifacts. In one trench, a deep pit was found. However, it was only realized that this pit was near 1.4 m in depth in the last days of the excavation and so very little of the pit's interior was actually exposed. The bottom was levelled with a layer of heavy silt/clay, on top of which a 2 cm-thick layer of wood and bark chips were laid. Though the pattern was repeated at least twice, very few artifacts were found in these fill layers.

This construction technique has been documented at fur trade posts across Canada where it is a common way of lining the bottom of a cellar under a house or an icehouse. In W.F. Wentzel's journal kept at the Fort of the Forks in the first decade of the 19th century, he describes root cellars for the garden's produce as well as an ice house, suggesting that the excavated pit may in fact be the remains of either an ice house or a root cellar associated with the Fort of the Forks. Unfortunately, the ploughing likely destroyed any building foundations that might have existed there, and only the full excavation of this pit and perhaps exploration for other similar features would help determine the true identity and age of the pit with any certainty.

This work at Fort Simpson, at or near the site of the Fort of the Forks was particularly meaningful on a very personal level. During the winter of 1810-11 conditions were so severe that five members of the local Native band died of starvation as well as 4 individuals of the post's complement of over-wintering men. Further work is planned at the site next summer.

123 **Archaeology**

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Reference Number: (NWT Archaeologists Permit 2002-920)
Region: IN **Location:** Northwestern Victoria Island

Northwestern Victoria Island Archaeological and Geological Survey Project

The aim of the Northwestern Victoria Island Archaeological and Geological Survey Project was to survey coastal areas along Richard Collinson Inlet and Prince Albert Peninsula, Victoria Island for evidence of Palaeoeskimo and subsequent Neoeskimo occupations. It was expected that evidence of Palaeoeskimo and Neoeskimo occupation could be used to establish the manner in which different groups used the area and how these groups were influenced by changes in their environment such as sea level, sea ice conditions, local currents, and climate change. It was anticipated that archaeological sites would be scattered along the beaches situated at about 20m above sea level (ASL) and below. Above 20m ASL it was hoped that shells, whalebone and/or driftwood would be found that could be used to construct a sea level curve for the area.

Owing to the harsher climate condition of Richard Collinson Inlet, the researchers did not expect to find the concentration of sites found during the 1999 and 2000 survey conducted by Jim Savelle and Art Dyke on southwestern Victoria Island of which this project is an extension. There did, however, expect a similar pattern of site location. Fifty-two sites were recorded of which less than half were located on beach ridges. Most sites were located on high ridges or near specific topographic features, which would either offer protection from the elements or a vantage point. These sites were found on route to other destinations and thus the results are not based on a systematic survey. Four camps were established and used as base locations for the survey. From the first camp, Workshop Point, a section of approximately 75 km along the coast and 15 km inland was surveyed and 3 sites were recorded; from the second camp, Loch Point, a section of approximately 40 km along the coast and 25 km inland was surveyed and 1 site was found; at the third camp, W. Richard Collinson Inlet, a section of approximately 37 km along the coast and the 15 km from the team's inland camp to the coast was surveyed and 23 sites were recorded; at the fourth camp, E. Richard Collinson Inlet, a section approximately 52 km along the coast and 10 km inland was surveyed and 25 sites were recorded. Most of the sites cannot be easily associated with one of the specific cultural groups because many of the features are amorphous or do not exhibit classic architectural attributes. There was a considerable amount of variation in the features found but they can essentially be divided into several types: cache sites, kill sites, stone tent rings, structures constructed of just stone or turf or a combination of these materials, and stone features. In addition to these finds, an historical period sod house was found ,as well as the outline of a canvas tent. Very few surface artifacts were located and in total only 4 artifacts were discovered including a microblade core, a unifacially worked flake, worked driftwood, and a partially made harpoon head.

124 **Archaeology**

Stoddart, Eleanor
Jacques Whitford Environment Ltd.
Calgary, AB

Reference Number: (NWT Archaeologists Permit 2002-922)
Region: SA **Location:** Mackenzie Valley Winter Road

Heritage Resources Assessment of Quarry Development near Km 838, Mackenzie Valley Winter Road

The GNWT Department of Transportation contracted Jacques Whitford Environment Limited to conduct a heritage resources assessment of a gravel pit and associated access road adjacent to km 838 of the Mackenzie Valley Winter Road, south of Tulita. Archaeological studies were undertaken in August 2002 to fulfill conditions attached to the Department of Transportation's quarrying permit obtained for work carried out in the winter of 2002. The project involved examination of a 45 m x 35 m quarry site. An associated 6-m wide access route runs east of the quarry for approximately 500 m, crossing the Enbridge Pipeline Inc. right-of-way and meeting the Mackenzie Valley Winter Road. During the field investigation, the gravel pit and access route were thoroughly surveyed by pedestrian traverse, and no evidence of historic resources was found. Although six previously recorded archaeological sites are recorded within 10 km of the quarry site, most are clustered at the mouth of the Saline River or along the banks of the Mackenzie River. None will be affected by the quarry development. It was recommended that the Department of Transportation be granted heritage resources approval.

125 **Archaeology**

Stoddart, Eleanor
Jacques Whitford Environmental Ltd.
Calgary, AB

Reference Number: (NWT Archaeologists Permit 2002-923)
Region: NS **Location:** between Mackay Lake and Gahcho Kué

Continuing Heritage Resource Inventory and Assessment at Gahcho Kué and on Winter Access Routes between Mackay Lake and Gahcho Kué

In August 2002, archaeological investigations were carried out in three areas in connection with De Beers' mineral exploration at Gahcho Kué (Kennady Lake) and use of a winter access route between MacKay Lake and Gahcho Kué. The main focus of work was to assess the effects of winter 2002 deviations of the 120 km-long MacKay Lake-Gahcho Kué winter access route. The work in the vicinity of Gahcho Kué was primarily associated with a winter access route constructed in 2002 from Gahcho Kué to MZ Lake, and a proposed airstrip to be constructed southeast of the De Beers Gahcho Kué camp.

The MacKay Lake-Gahcho Kué winter access route runs from MacKay Lake to Gahcho Kué, via Reid, Munn, Margaret and Murdock Lakes. Part of the route was inspected by helicopter flyover, with the intention of inspecting deviations in the route made during the winter of 2002. One deviation was noted approximately 8 km north of the Gahcho Kué camp, and was thoroughly surveyed by pedestrian traverse. No new archaeological sites were noted, and no previously recorded sites were found to have been disturbed by 2002 winter traffic.

The Gahcho Kué-MZ Lake route was also over flown and the westernmost section near MZ Lake was inspected by pedestrian traverse, as it was located on higher ground than the surrounding area. No sites were found along the access route. Five sites recorded within 50 m of the lakeshore during a 2001 survey were assessed for potential conflicts with the access route; none of these sites will be affected. The location of a proposed airstrip southeast of the De Beers Canada Exploration (DBCE) Gahcho Kué mineral exploration camp was also inspected by pedestrian traverse, and no new sites were recorded. The nearest known site is approximately 650 m from the proposed airstrip. It will not be affected by its construction but may be at risk from construction of an access road connecting the airstrip and camp.

There are currently 264 previously recorded archaeological sites within 20 km of the DBCE Gahcho Kué camp near the south end of Gahcho Kué, and on and adjacent to the winter access routes. The number and density of sites found over the past four years indicates that surveys of winter access routes are a necessary form of impact assessment and heritage resource management, and a productive source of knowledge. It is recommended that a more extensive survey be conducted in selected locations to better understand precontact and historic site location preferences, to be better able to predict site locations, and to identify additional sites that may be affected by a change in various exploration and development projects.

Department of Resources, Wildlife & Economic Development

WILDLIFE RESEARCH PERMITS

126 **Wildlife**

Bollinger, Karen
US Fish & Wildlife
11500 American Holly Drive
Laurel, MD USA 20708-4002

Reference Number: 2963
Region: DC **Location:** Mills Lake Banding Station (Fort Providence area)

Objective: To conduct the annual Mills Lake Banding Program under the Western Canada Cooperative Waterfowl Banding Program at the Mills Lake Station.
Species studied: Mallard, northern pintail, green and blue-winged teal

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127 **Wildlife**

Branigan, Marsha and John Nagy
RWED
BAG SERVICE 1
Inuvik, NT X0E 0T0

Reference Number: 2906
Region: IN **Location:** Inuvik region where polar bears reside

Objective: To conduct the Canadian portion of the Circum-Polar Bear Contaminants Program to measure contaminants in polar bear tissues and to identify diet components of polar bears.
Species studied: Polar bear

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128 **Wildlife**

Carmichael, Lindsey
Dept of Biological Sciences
University of Alberta
Edmonton, AB T6G 2E9

Reference Number: 2922
Region: NS, SS, SA **Location:** various locations

Population Genetic Structure, Dispersal Patterns and Subspecies Classification of Arctic Foxes
Objective: To conduct a study on population genetic structure, dispersal patterns and subspecies classification of arctic foxes in the NWT in order to: 1) estimate levels of genetic variation; 2) determine amount and direction of dispersal and genetic exchange among fox populations; and 3) identify geographic and biological factors that influence the gene flow.
Species studied: Arctic fox

129 **Wildlife**

Carrière, Suzanne
RWED, Wildlife and Fisheries
5th Floor, 600 - 5102 - 50th Avenue
Yellowknife, NT X1A 3S8

Reference Number: 2957
Region: various **Location**: various locations throughout the NWT

Northwest Territories Small Mammal and Hare Survey

Objective: To establish the ability to predict small mammal cycles throughout the NWT. Trend information is used in predicting population trends of economically important furbearers, and in other wildlife, and monitoring successional changes in ecosystems.
Species studied: Small mammals and hare

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130 **Wildlife**

Carrière, Suzanne
RWED, Wildlife and Fisheries
5th Floor, 600 - 5102 - 50th Avenue
Yellowknife, NT X1A 3S8

Reference Number: 2924
Region: NS, SS, DC **Location:** various locations in the North Slave, South Slave and Deh Cho regions

Snow-track Monitoring of Fur-bearers and Hares

Objective: The aim of this study is to continue monitoring fur-bearer and hare populations in two eco-zones of the NWT.
Species studied: Hare, fur-bearers (lynx, mink, weasel, wolverine, red fox etc)

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131 **Wildlife**

Carrière, Suzanne
RWED, Wildlife and Fisheries
5th Floor, 600 - 5102 - 50th Avenue
Yellowknife, NT X1A 3S8

Reference Number: 2893
Region: NS, SS **Location:** taiga shield watershed

Objective: To continue a multi-disciplinary study of post fire effects on a Taiga watershed by monitoring fur-bearers and hare in recently burned and unburned areas.
Species studied: Hare, fur-bearers

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132 **Wildlife**

Caswell, Dale and Keith Warner
Canadian Wildlife Service, Environment Canada
Prairie and Northern Region
115 Perimeter Road
Saskatoon, SK S7N 2E5

Reference Number: 2943
Region: IN **Location:** Banks Island # 1 Bird Sanctuary, Anderson River Bird Sanctuary and the Kendall Island Bird Sanctuary

Objective: To carry out a study estimating the population growth of Lesser Snow Geese.
Species studied: Lesser Snow Geese

133 **Wildlife**

Cluff, Dean
RWED
North Slave Region
P O BOX 2668
Yellowknife, NT X1A 2P9

Reference Number: 2928
Region: various **Location:** the boreal forest and central tundra regions of the NWT

Objective: Genetics, movements and management of wolves in the north.
Species studied: Wolf

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134 **Wildlife**

Cluff, Dean
RWED
North Slave Region
P O BOX 2668
Yellowknife, NT X1A 2P9

Reference Number: 2948
Region: NS **Location:** near the Lac de Gras area southeast to Snap Lake

Objective: To study the responses of denning wolves to human activity and seasonal caribou densities. To quantify the behavioral response of wolves to human activity near den sites and to compare parental care activity at dens during periods of low and high availability of caribou.
Species studied: Wolf

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135 **Wildlife**

Copeland, Jeff and Robert Mulders
USDA Forest Service/RWED
Rocky Mountain Research Station
P O Box 8089
Missoula, MT 59807

Reference Number: 2919
Region: NS **Location:** 45 km radius of Daring Lake

Objective: To test the efficacy of a protocol based on lures and hair-snagging to detect the presence of wolverines.
Species studied: Wolverine (Gulo gulo)

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136 **Wildlife**

Elkin, Brett
RWED, Wildlife and Fisheries
5th Floor, 600 - 5102 - 50th Avenue
Yellowknife, NT X1A 1H1

Reference Number: 2894
Region: All **Location:** various locations throughout the Northwest Territories

Objective: To conduct annual wildlife health and genetic monitoring by testing samples from sick or dead animals throughout various location of the NWT.
Species studied: Various

137 **Wildlife**

Evans, Kevin
Kavik-AXYS Incorporated
P.O. Box 2320
Inuvik, NT X0E 0T0

Reference Number: 2918
Region: IN **Location:** Mackenzie Delta within the Inuvialuit Settlement Region

Objective: To conduct baseline waterfowl surveys of the area within and near the Devon Canada Offshore Lease Area.
Species studied: All waterfowl

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138 **Wildlife**

Ferguson, Carl
U.S. Fish and Wildlife Service
Patuxent Wildlife Research Center
11500 American Holly Drive
Laurel, MD USA 20708

Reference Number: 2964
Region: NS **Location:** Stagg River Delta 13 m SW of Rae

Objective: To conduct the annual Preseason Waterfowl Banding Program at the Stagg River Station under the Western Canada Cooperative Waterfowl Banding Program.
Species studied: Mallard, northern pintail, green and blue-winged teal

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139 **Wildlife**

Glendinning, Stephen
Golder Associates
10th Floor, 940 - 6TH Avenue SW
Calgary, AB T2P 3T1

Reference Number: 2933
Region: DC **Location:** Paramount's Cameron Hills Gathering System and Transborder Pipeline

Objective: To conduct winter track counts along the newly constructed Cameron Hills Gathering System and Transborder Pipeline.
Species studied: Ungulates, furbearers and any other wildlife or wildlife signs

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140 **Wildlife**

Gunn, Anne
RWED, Wildlife and Fisheries
5th Floor, 600 - 5102 - 50th Avenue
Yellowknife, NT X1A 3S8

Reference Number: 2895
Region: DC **Location:** Selwyn Logan Mountains

To conduct a survey on distribution and movements of the South Nahanni Mountain Caribou herd in the Selwyn-Logan Mackenzie Mountains
Species studied: Caribou - South Nahanni Caribou Herd

141 **Wildlife**

Gunn, Anne
RWED, Wildlife and Fisheries
5th Floor, 600 - 5102 - 50th Avenue
Yellowknife, NT X1A 3S8

Reference Number: 2897
Region: DC **Location:** various locations throughout the Deh Cho region

Objective: To continue studies on the movement of Boreal Caribou, habitat and land use planning in the Deh Cho region.
Species studied: Caribou

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142 **Wildlife**

Gunn, Anne
RWED, Wildlife and Fisheries
5th Floor, 600 - 5102 - 50th Avenue
Yellowknife, NT X1A 3S8

Reference Number: 2929
Region: NS, SS **Location:** along the migration paths of the Bathurst Caribou herd

Objective: To continue to monitor the movements of the Bathurst Caribou herd and specifically; 1) to capture 10 cows and fit with ST18 satellite collars in March; and 2) To continue to acquire location data from collars currently deployed on 13 cows from the Bathurst caribou herd and an additional 10 collars to be deployed March.
Species studied: Bathurst caribou

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143 **Wildlife**

Hazzard, Shannon
Department of Biology, U of Saskatchewan
112 Science Place
Saskatoon, SK S7N 5E2

Reference Number: 2927
Region: IN **Location:** Gwich'in Settlement Area of the Mackenzie Delta

Objective: To study the habitat requirements of white-winged and surf scoters in the Mackenzie Delta region of the NWT.
Species studied: white-winged and surf scoters

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144 **Wildlife**

Hines, James
Canadian Wildlife Service, Environment Canada
Suite 301, 5204 - 50TH Avenue
Yellowknife, NT X1A 1E2

Reference Number: 2941
Region: IN **Location:** Prince Patrick and Melville Islands

The Status, Demography and Winter Habitat Use of Gray-bellied Brant
Objective: To determine if gray-bellied brant can or should be managed as a distinct stock.
Species studied: Gray-bellied brant

145 **Wildlife**

Hines, James
Canadian Wildlife Service, Environment Canada
Suite 301, 5204 - 50TH Avenue
Yellowknife, NT X1A 1E2

Reference Number: 2953
Region: NS **Location:** area within 400 m of each side of the Yellowknife Highway starting 16 km west of Yukon to 48 km west

Objective: The main objective is to continue the study of abundance and productivity of waterfowl and other aquatic birds breeding in the boreal forest near the Yellowknife Highway and Rae. Specifically; 1) to determine factors limiting size, composition and productivity of breeding population of aquatic birds; 2) improve and develop new survey designs for censusing duck populations; and 3) determine factors affecting variability of lessor scaup populations.
Species studied: All dabbling ducks, diving ducks, loons, and grebes in area

146 **Wildlife**

Hines, James
Canadian Wildlife Service, Environment Canada
Suite 301, 5204 - 50TH Avenue
Yellowknife, NT X1A 1E2

Reference Number: 2955
Region: IN **Location:** Banks Island #1, Anderson River, Kendall Island Bird Sanctuary

Objective: Studies of populations and habitat of Lesser Snow Geese in the Inuvialuit Settlement Region.
Species studied: Lesser Snow Geese

147 **Wildlife**

Hubert, Ben
Hubert & Associates Limited
1660 Evergreen Hill SW
Calgary, AB T2Y 3B6

Reference Number: 2930
Region: NS **Location:** Izok Lake

Objective: To commence survey work on the Izok Project Wildlife Base Line Studies.
Species studied: All indigenous wildlife will be surveyed

148 **Wildlife**

Johannesen, Daryl
Golder Associates
10th Floor, 940 6TH Avenue SW
Calgary, AB T2P 3T1

Reference Number: 2962
Region: DC **Location:** Cameron Hills Gathering System

Objective: To conduct Biophysical Assessments for proposed well locations and flow lines associated with the newly constructed Cameron Hills Gathering System. To investigate potential well locations and flow line route options within the Significant Discovery Area and identify and quantify wildlife species in those areas.
Species studied: All wildlife species

149 **Wildlife**

Johnstone, Dr. Robin
De Beers Canada Mining Inc.
#300, 5201 - 50TH Avenue
Yellowknife, NT X1A 3S8

Reference Number: 2946
Region: NS **Location:** Snap Lake

Objective: To conduct the 2002 Environmental Survey at Snap Lake. The rationale for the monitoring program is to ensure that predictions concerning the effects on wildlife in the EA are correct and to contribute to a regional database for investigating.
Species studied: Caribou, grizzly bears, wolves, wolverines, and raptors

150 **Wildlife**

King, Rodney J.
US Fish & Wildlife
P O Box 2012
Mare Island, CA 94592

Reference Number: 2905
Region: IN **Location:** Mackenzie Delta

Objective: To capture and band migratory birds in the Mackenzie Delta under the Western Canada Cooperative Waterfowl Banding Program.
Species studied: Mallards, northern pintail, green-winged teal

151 **Wildlife**

Larsen, Karl W.
University College of the Caribou
P O BOX 3010
Kamloops, BC V2C 5N3

Reference Number: 2951
Region: SS **Location:** Wood Buffalo National Park Region

Objective: To conduct a survey determining age-structure and genetic heterogeneity of garter snake populations in the Wood Buffalo National Park region.
Species studied: Garter snakes

152 **Wildlife**

Latour, Paul
Canadian Wildlife Service, Environment Canada
Suite 301, 5204 - 50TH Avenue
Yellowknife, NT X1A 1E2

Reference Number: 2911
Region: IN **Location:** Kendall Island Bird Sanctuary

Objective: To carry out studies on the effects of seismic exploration on migratory birds and their habitats in the Kendall Island Bird Sanctuary.
Species studied: Migratory waterfowl and vegetation

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153 **Wildlife**

Latour, Paul
Canadian Wildlife Service, Environment Canada
Suite 301, 5204 - 50TH Avenue
Yellowknife, NT X1A 1E2

Reference Number: 2956
Region: SA **Location:** Mills Lake and Horn Plateau

Objective: As identified in Step 5 of the NWT Protected Areas Strategy, to obtain a habitat based inventory of the migratory bird community in the Mills Lake wetlands and Horn Plateau which form the Edezhie candidate protected area.
Species studied: Migratory waterfowl

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154 **Wildlife**

MacDonald, Bruce
Ducks Unlimited Canada
5017 52nd Street
Yellowknife, NT X1A 1T5

Reference Number: 2944
Region: SA **Location:** Norman Wells Land Sat Image within the Sahtu Settlement Area

Objective: The main objective is to conduct a survey on the waterbird ecology of wetland habitats for the Norman Wells LandSat Image specifically; 1) Determine through standardized aerial surveys of randomly selected wetlands, the distribution and abundance of waterbirds breeding within the Norman Wells area and 2) provide this information to partners within the Sahtu Settlement Area.
Species studied: All mammal and bird species and their signs

155 **Wildlife**

MacDonald, Bruce
Ducks Unlimited Canada
5017 52nd Street
Yellowknife, NT X1A 1T5

Reference Number: 2954
Region: IN **Location:** Peel Plateau area

Objective: To conduct aerial and ground surveys to determine the distribution and abundance of waterbirds breeding in the Peel Plateau area.
Species studied: Breeding populations of ducks and other waterfowl

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156 **Wildlife**

MacDonald, Bruce
Ducks Unlimited Canada
5017 52nd Street
Yellowknife, NT X1A 1T5

Reference Number: 2915
Region: IN **Location**: Lower Mackenzie Valley within the Gwich'in Settlement Area

Waterbird Ecology of the Lower Mackenzie River in the GSA
Objective: To determine through standardized aerial surveys of randomly selected wetlands, the distribution and abundance of waterbirds breeding within the Lower Mackenzie River and to provide this information to partners within the Gwich'in Settlement Area to aide local managers make informed decisions about land use practices.
Species studied: All mammal and bird species and/or their signs

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157 **Wildlife**

MacDonald, Bruce
Ducks Unlimited Canada
5017 52nd Street
Yellowknife, NT X1A 1T5

Reference Number: 2961
Region: IN **Location:** Lower Mackenzie River within the Inuvialuit Settlement Region

Objective: To determine through standardized aerial surveys of randomly selected wetlands, the distribution and abundance of waterbirds and to provide this information to partners within the ISR to help local managers make informed decisions about land use practices.
Species studied: All mammal and bird species and/or their signs

158 **Wildlife**

Machtans, Craig
Canadian Wildlife Service, Environment Canada
Suite #301, 5204 – 50th Avenue
Yellowknife, NT X1A 1E2

Reference Number: 2940
Region: DC **Location:** boreal forests within 50km of Fort Liard

Objective: To assess the impacts of seismic lines on songbirds in the boreal forests within 50 km of Fort Liard.
Species studied: Songbirds

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159 **Wildlife**

Machtans, Craig
Canadian Wildlife Service, Environment Canada
Suite #301, 5204 – 50th Avenue
Yellowknife, NT X1A 1E2

Reference Number: 2939
Region: DC **Location:** Fort Liard Valley Forest

The Liard Valley Forest Songbird Project
Objective: To assess bird-habitat relationships in the Ford Liard Valley and to create a baseline data set for monitoring long-term changes of birds in the area.
Species studied: Forest songbirds

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160 **Wildlife**

Madsen, Eric and Cheryl Wray
Diavik Diamond Mines Inc
P O Box 2498
Suite 205, 5007 – 50th Avenue
Yellowknife, NT X1A 2P8

Reference Number: 2935
Region: NS **Location:** local study area of the proposed Diavik diamond mine area

Objective: To commence the 2002 Wildlife Monitoring Program for Diavik Diamond Mines in the Lac de Gras area.
Species studied: Barren-ground caribou, waterfowl, raptors, breeding birds, grizzlies, wolves, wolverine, and foxes.

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161 **Wildlife**

Mears, Margaret
Alpine Environmental Consulting Limited
3740F - 11 A Street NE
Calgary, AB T2E 6M6

Reference Number: 2802
Region: DC **Location:** Fort Liard region

Objective: To conduct a wildlife and habitat survey for Anadarko Canada Corporation's drilling and production project in the Ft. Liard area. To record wildlife or their signs in the study area as part of an environmental assessment for the proposed 2002/2003 drilling activities.
Species studied: All mammal and bird species and their signs

162 **Wildlife**

Melo, Octavio
Indian Affairs & Northern Development
P O Box 1500
Yellowknife, NT X1A 2R3

Reference Number: 2938
Region: NS **Location:** Colomac Mine area and vicinity

Terrestrial Monitoring Groundtruthing Exercise Program

Objective: To determine the concentration of contaminants in wildlife exposed to mine tailings. This information will help assess the impacts in wildlife and humans who depend on wildlife for food.
Species studied: Small mammals, caribou, grouse

163 **Wildlife**

Melo, Octavio
Indian Affairs & Northern Development
P O Box 1500
Yellowknife, NT X1A 2R3

Reference Number: 2965
Region: NS **Location**: Colomac Mine and Vicinity

Objective: This project is an extension of a previous study for the collection of wildlife samples for the determination of contaminant levels. The objective is to determine contaminant levels in such vegetation as lichen and mushrooms as well as to continue the study of caribou, ducks, rabbits and other small game.
Species studied: Various wildlife and vegetation

164 **Wildlife**

Mock, Karen
Dept of Forest, Range & Wildlife Resources
Utah State University
5230 Old Main Hill
Logan, Utah 84322-5230

Reference Number: 2923
Region: SA **Location:** Sahtu Settlement Area

Assessment of Range-wide Genetic Variation in Sharp-tailed Grouse

Objective: 1) To describe genetic variation across the range of the sharp-tailed grouse in Canada and the US; and 2) to determine whether these patterns support the current subspecific designations in this species.
Species studied: Sharp-tailed grouse

165 **Wildlife**

Moore, Steve
EBA Engineering Consultants Ltd.
P O Box 2244
201, 4916 – 49th Street
Yellowknife, NT X1A 2P7

Reference Number: 2907
Region: NS **Location:** Gaucho Kué (Kennady Lake)

Objective: 1) To gather baseline information on caribou abundance and distribution in relation to exploration at Gaucho Kué; and 2) to determine the abundance and distribution of caribou in relation to DeBeers' exploration program during the spring migration, post-calving period and fall migration.
Species studied: Barren-ground caribou

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166 **Wildlife**

Moore, Steve
EBA Engineering Consultants Ltd.
P O Box 2244
201, 4916 – 49th Street
Yellowknife, NT X1A 2P7

Reference Number: 2917
Region: SA **Location:** Sahyoue/Edacho National Historic Park (Great Bear Lake)

Objective: 1) To gather baseline information on wildlife and vegetation to help fulfil step 5 of the NWT Protected Areas Strategy process; 2) to document wildlife and wildlife signs in the study area (Sahyoue Peninsula); and 3) to classify and describe vegetation communities.
Species studied: Various wildlife and vegetation

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167 **Wildlife**

Mulders, Robert
RWED, Wildlife and Fisheries
5th Floor, 600 5102 - 50th Avenue
Yellowknife, NT X1A 3S8

Reference Number: 2947
Region: NS **Location:** Lac de Gras area

Objective: To conduct a survey on barren-ground grizzly bear habitat use.
Species studied: Barren-ground grizzly bears.

168 **Wildlife**

Mulders, Robert
RWED, Wildlife and Fisheries
5th Floor, 600 5102 - 50th Avenue
Yellowknife, NT X1A 3S8

Reference Number: 2925
Region: SS **Location:** Fort Resolution

The Marten Harvest Study in the Vicinity of Fort Resolution

Objective: 1) To assess age and sex composition, condition, diet and reproductive status; and 2) to determine whether a simple protocol can be developed that might enable local trappers to monitor the age and sex ratios of their marten harvest.
Species studied: Marten

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169 **Wildlife**

Nagy, John
RWED
Bag Service # 1
Inuvik, NT X0E 0T0

Reference Number: 2942
Region: IN **Location:** Gwich'in Settlement Area

Objective: To conduct a survey on the ecology of Boreal Woodland Caribou in the Gwich'in Settlement Area.
Species studied: Boreal Woodland Caribou

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170 **Wildlife**

Nagy, John
RWED
Bag Service # 1
Inuvik, NT X0E 0T0

Reference Number: 2950
Region: IN **Location:** Richards Island and the Tuktoyaktuk Peninsula

Objective: To survey the seasonal distribution, movements and denning areas used by grizzly bears.
Species studied: Grizzly bears.

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171 **Wildlife**

Nagy, John and Alasdair Veitch
RWED
Bag Service # 1
Inuvik, NT X0E 0T0

Reference Number: 2900
Region: IN **Location:** Lower Tuk Peninsula and Richards Island

Objective: To survey the range use and movements of the Cape Bathurst and Bluenose-West Caribou Herds using satellite tracking.
Species studied: Bluenose-West caribou, Cape Bathurst caribou

172 **Wildlife**

Newyar, Chuck
IMG-Golder Corporation
Suite 206 125 Mackenzie Road
P O Box 2340
Inuvik, NT X0E 0T0

Reference Number: 2960
Region: IN, SA **Location:** Gwich'in and Sahtu Settlement Areas

Objective: 1) To conduct an environmental survey for a proposed seismic program in the Gwich'in and Sahtu Settlement Areas; and 2) to collect information on wildlife, wildlife signs (e.g., tracks, browse, pellets, dens, nests) and wildlife habitat in the study area.
Species studied: All mammal and bird species and their signs

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173 **Wildlife**

Nishi, John
RWED
P O Box 390
Fort Smith, NT X0E 0PO

Reference Number: 2913
Region: SS **Location:** Fort Resolution NT - Hook Lake Wood Bison

Project on Salvage and Propagation of the Hook Lake Wood Bison
Objective: 1) To provide veterinary care and treatment to eliminate tuberculosis and brucellosis; 2) to propogate a disease-free, captive herd of bison that originated from the Hook Lake area and 3) to maintain the genetic integrity of the salvaged herd.
Species studied: Wood bison

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174 **Wildlife**

Nishi, John
RWED
P O Box 390
Fort Smith, NT X0E 0PO

Reference Number: 2958
Region: SS **Location:** Greater Wood Buffalo National Park

Defining Suitable Habitat for Wood Bison using Remote Sensing and Geographic Information Systems.
Objective: 1) Define suitable habitat in the context of wood bison management and recovery; 2) define critical habitat in the context of wood bison and in consideration of the proposed Species At Risk Legislation (SAR).
Species studied: Wood bison

175 **Wildlife**

Nishi, John
RWED
P O Box 390
Fort Smith, NT X0E 0PO

Reference Number: 2959
Region: SS **Location:** Slave River Lowlands

Slave River Lowland's Bison Population Studies

Objective: 1) To collect fecal samples to determine prevalence of Johne's disease and other parasites in free ranging bison; 2) To measure calf, yearling and bull to cow ratios during post-calving period for Hook Lake and Grand Detour herds; 3) To sample soil at carcass sites.
Species studied: Bison

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176 **Wildlife**

Nishi, John
RWED
P O Box 390
Fort Smith, NT X0E 0PO

Reference Number: 2801
Region: DC **Location:** Fort Providence area

The Mackenzie Wood Bison Population Monitoring Project

Objective: 1) To measure calf, yearling and bull to cow ratios during post-calving period; 2) To monitor the Mackenzie herd for the presence of brucellosis and tuberculosis; and 3) To monitor the Mackenzie herd for the occurrence of anthrax related mortalities in summer.
Species studied: Wood bison

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177 **Wildlife**

Nishi, John
RWED
P O Box 390
Fort Smith, NT X0E 0PO

Reference Number: 2920
Region: DC **Location:** Fort Liard and Nahanni Butte area

Monitoring of the Liard Wood Bison Population

Objective: 1) To measure calf, yearling and bull to cow ratios during the post-calving period; 2) To census the Liard bison population; and 3) To monitor the Liard herd for the presence of brucellosis and tuberculosis.
Species studied: Wood bison

178 **Wildlife**

Olsen, Ben
Sahtu Renewable Resources Board
P O Box 134
Tulita, NT X0E 0K0

Reference Number: 2901
Region: SA **Location**: Deline

Selected Heavy Metal and Radionuclide Contaminant Levels in Barren-Ground Caribou of the Bluenose-East Population Wintering near Deline

Objective: 1) To remove VHF radio-collars, which were used for conducting a photo-census in July 2000 and 2001. The study is complete therefore the collars are no longer required so they will be removed upon request of Deline Renewable Resources Council; 2) To collect biological samples for determining body condition.
Species studied: Barren-ground caribou

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179 **Wildlife**

Olsen, Ben
Sahtu Renewable Resources Board
P O Box 134
Tulita, NT X0E 0K0

Reference Number: 2931
Region: SA **Location:** Carajou, Keele & Redstone watersheds in the Central Mackenzie Mountains

Objective: To commence a survey of Woodland Caribou movements in the Central Mackenzie Mountains.
Species studied: Woodland Caribou

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180 **Wildlife**

Povey, Andrew
Tera Environmental Consultants
Suite 1100, 815 8th Avenue S W
Calgary, AB T2P 3P2

Reference Number: 2902
Region: SA **Location:** Proposed Mackenzie Valley Pipeline Route in the Sahtu Settlement Area

Objective: To commence the 2002 Wildlife Studies within the Sahtu Settlement Area. Sampling on winter aerial for ungulates; winter snow tracking; spring pellet group counts and spring migratory waterfowl.
Species studied: Various species and their signs

181 **Wildlife**

Povey, Andrew
Tera Environmental Consultants
Suite 1100, 815 8th Avenue S W
Calgary, AB T2P 3P2

Reference Number: 2898
Region: IN **Location:** Gwich'in Settlement Area of the proposed Mackenzie Valley Pipeline Route

Objective: To commence the 2002 Wildlife Studies in the Gwich'in Settlement Area. Sampling of winter aerial for ungulates; winter snow tracking; spring pellet group counts and spring migratory waterfowl.
Species studied: Various species and their signs

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182 **Wildlife**

Povey, Andrew
Tera Environmental Consultants
Suite 1100, 815 8th Avenue S W
Calgary, AB T2P 3P2

Reference Number: 2899
Region: IN **Location:** Inuvialuit Settlement Region, including Kendall Island Bird Sanctuary

Objective: To commence 2002 Wildlife Studies in the Inuvialuit Settlement Region. Sampling of winter aerial for ungulates; winter snow tracking; spring pellet group counts and spring migratory waterfowl.
Species studied: Various species and their signs

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183 **Wildlife**

Povey, Andrew
Tera Environmental Consultants
Suite 1100, 815 8th Avenue S W
Calgary, AB T2P 3P2

Reference Number: 2934
Region: DC **Location:** Deh Cho region of the proposed Mackenzie Valley Pipeline route

Objective: To commence the 2002 Wildlife Studies in the Deh Cho Region. Winter aerial survey for: ungulates; winter snow tracking; spring pellet group counts; spring migratory waterfowl; amphibian survey.
Species studied: Various species and their signs

184 **Wildlife**

Rabesca, Joe
Dogrib Treaty 11 Council
P O Box 412
Rae-Edzo, NT X0E 0Y0

Reference Number: 2921
Region: NS **Location:** Dogrib Traditional Territory southwest of Edzo

Objective: To conduct a study on the body condition and disease status of the Mackenzie Wood Bison Herd. Two male bison will be harvested by Dogrib hunters within the Dogrib Traditional area to the south west of Edzo. Body condition measurements will be taken and samples will be collected for laboratory analyses for Brucellosis, Tuberculosis, and Johne's disease.
Species studied: Wood bison

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185 **Wildlife**

Robertson, Myra and Grant Gilchrist
Canadian Wildlife Service, Environment Canada
Suite 301, 5204 – 50th Avenue
Yellowknife, NT X1A 1E2

Reference Number: 2914
Region: IN **Location:** Cape Perry

Murre Survey at Cape Perry
Objective: To obtain an accurate estimate of the current number of thick-billed murres nesting at Cape Perry. This information will be compared to previous population estimates at the colonies and will be used to assess the current population status of the murres.
Species studied: Thick-billed murres

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186 **Wildlife**

Scheer, Aedes
Yukon College
P O Box 263
Dawson City, YT Y0B 1G0

Reference Number: 2908
Region: IN **Location:** communities of Aklavik, Ft. McPherson and Tsiigehtchic

Parasite Survey of the Porcupine Caribou
Objective: 1) To identify major parasites; 2) to produce a field guide pamphlet; and 3) to create lessons and materials for use in schools and college level biology courses.
Species studied: Porcupine Caribou

187 **Wildlife**

Shaffer, Francois
Canadian Wildlife Service
1141 Route de L'Eglise
P O Box 10100 9th Floor
Sainte-Foy, QC G1V 4H5

Reference Number: 2912
Region: NS **Location:** 30 miles from Yellowknife (Yellowknife to Rae road)

Objective: Quantify the amount of gene flow between the Horned Grebe population (Quebec) and the population (continuous breeding range) of western North America
Species studied: Horned grebe

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188 **Wildlife**

Slattery, Stuart
Ducks Unlimited Canada
P O Box 1160
Stonewall, MB R0C 2Z0

Reference Number: 2949
Region: SA **Location:** Oscar Lake or Willow Lake (Tulita)

Objective: To conduct a study on the demographic rates and factors limiting breeding duck populations at Willow Lake in the Mackenzie Valley
Species studied: Lesser scaup, scoters

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189 **Wildlife**

Slattery, Stuart
Ducks Unlimited Canada
P O Box 1160
Stonewall, MB R0C 2Z0

Reference Number: 2916
Region: IN **Location:** Mackenzie Valley Tundra-Cardinal-Clearwater Lakes complex about 50 m south of Inuvik

Objective: To study demographic rates and factors limiting breeding populations of scoters (black ducks) in the Mackenzie Valley area. Populations of waterfowl breeding in the Mackenzie Valley have been dwindling (scaup and scoters) and reasons are unknown. Wildlife Managers need biological information if we are to understand why these birds are disappearing and attempt to reverse the trend.
Species studied: Scoters

190 **Wildlife**

Swystun, Heather
University of Northern British Columbia
P O Box 1864
Inuvik, NT X0E 0T0

Reference Number: 2903
Region: IN **Location:** Mackenzie Delta, Tuktoyaktuk Peninsula, Anderson River, Kendall Island Bird Sanctuary

Reproductive Ecology of Tundra Swans in the Mackenzie Delta Region

Objective: 1) To collect field data on reproductive ecology of tundra swans; and 2) to monitor potential impacts of oil and gas development and climate change on tundra swans.
Species studied: Tundra swans

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191 **Wildlife**

Tate, Douglas
Nahanni National Park
P O Box 348
Fort Simpson, NT X0E 0N0

Reference Number: 2910
Region: DC **Location:** Nahanni National Park Reserve

Objective: To conduct Grizzly Bear research in the Nahanni National Park Reserve and vicinity.
Species studied: Grizzly bears.

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192 **Wildlife**

Veitch, Alasdair
RWED
P.O. Box 130
Norman Wells, NT X0E 0V0

Reference Number: 2945
Region: SA **Location:** Willow Lake (Brackett Lake) in the Loche River watershed (24m) north of Tulita

Objective: To continue the duck-banding program at Willow Lake in conjunction with the Western Canada Cooperative Duck Banding Program
Species studied: Mallards, northern pintail, green-winged teal

193 **Wildlife**

Veitch, Alasdair and Arianna Zimmer
RWED
P.O. Box 130
Norman Wells, NT X0E 0V0

Reference Number: 2952
Region: SA **Location:** Mackenzie Valley

Historic and Current Movements, Distribution and Habitat Use of Boreal Woodland Caribou in the Sahtu Settlement Area

Objective: Boreal woodland caribou have been listed as a 'threatened' species by the Committee on the Status of Endangered Wildlife in Canada in 2000. The Committee is concerned that the number of Boreal woodland caribou in the NWT is declining.
Species studied: Boreal woodland caribou

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194 **Wildlife**

Voelzer, James F.
US Fish & Wildlife
Room 125
911 N E 11th Avenue
Portland, OR 97232-4181

Reference Number: 2937
Region: ALL **Location:** Mackenzie River Drainage area from Fort Smith to Tuktoyaktuk

Objective: The annual survey to determine and monitor the size and species composition of the breeding population of ducks and other waterfowl in the Mackenzie River drainage.
Species studied: breeding population of ducks and other waterfowl

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195 **Wildlife**

Witteman, John and Allison Armstrong
BHP Diamonds Inc.
#1102, 4920 - 52nd Street
Yellowknife, NT X1A 3T1

Reference Number: 2936
Region: NS **Location:** BHP Diamonds Inc property surrounding the Ekati Diamond Mine

Objective: To test impact predictions and efficacy of mitigation measures for the species studied. The objective of the wildlife effects monitoring program is to use the monitoring results to evaluate the effectiveness of mitigation measures.
Species studied: Caribou, grizzly bears, wolves, wolverines, Upland breeding birds, loons, and raptors.

Department of Fisheries & Oceans

FISHERIES SCIENTIFIC LICENCES

196 **Fisheries**

Carmack, Eddy
Department of Fisheries and Oceans
Box 6000 9860 W. Saanich Road
Sidney, BC V8L 4B2

File No: SLE-02/03-272
Location: Beaufort Sea - Study area bounded by: 69°10'48"; 73°16'00" and 116°07'12"; 140°55'12"

Objectives: To determine the composition and abundance of zooplankton populations for comparison to those found in coastal and shelf environments and to study the relationship between biodiversity and the environment.

197 **Fisheries**

Cobb, Donald
Department of Fisheries and Oceans
501 University Cres.
Winnipeg, MB R3T 2N6

File No: SLE-02/03- 228
Location: Mackenzie River (mouth of the Pokiak Channel at 68°13'10" 135°00'20")

Objectives: To continue a long term monitoring program to provide communities with information on the health of fish stocks.

198 **Fisheries**

Cobb, Donald
Department of Fisheries and Oceans
501 University Cres.
Winnipeg, MB R3T 2N6

File No: SLE-02/03- 229
Location: Tuktoyaktuk Harbour; 69°26'00" 13°85'00"

Objectives: To continue a long term monitoring program to provide communities with information on the health of fish stocks.

199 **Fisheries**

Cobb, Donald
Department of Fisheries and Oceans
501 University Cres.
Winnipeg, MB R3T 2N6

File No: SLE-02/03- 230
Location: Shingle Point; 68°59'00" 137°22'00"

Objectives: To continue a long term monitoring program to provide communities with information on the health of fish stocks.

200 **Fisheries**

Harwood, Lois
Department of Fisheries and Oceans
Box 1871
Inuvik, NT X0E 0T0
harwood@dfo-mpo.gc.ca

File No: SLE-02/03-242
Location: Sitidgi Lake

Objectives: To obtain baseline information on the physical characteristics of Sitidgi Lake, it's fish and other aquatic life; to document population parameters for lake trout; to estimate fish abundance and; to determine the present exploitation rate of lake trout by tagging.

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201 **Fisheries**

Harwood, Lois
Department of Fisheries and Oceans
Box 1871
Inuvik, NT X0E 0T0
harwood@dfo-mpo.gc.ca

File No: SLE-02/03-243
Location: Eskimo Lakes (Husky Lakes) 69-09 N x 132-40 W.

Objectives: To obtain baseline information on the physical characteristics of Husky Lakes, it's fish and other aquatic life; to document population parameters for lake trout; to estimate fish abundance and; to determine the present exploitation rate of lake trout by tagging.

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202 **Fisheries**

Harwood, Lois
Department of Fisheries and Oceans
Box 1871
Inuvik, NT X0E 0T0
harwood@dfo-mpo.gc.ca

File No: SLE-02/03-244
Location: Browns Harbour 70-08 N x 124-22.5W

Objectives: To document the range and movement of ringed seals; to examine the depth and duration of ringed seal dives, time at surface and distribution and movements of tagged seals in relation to ice conditions and oceanographic features; to develop and utilize local expertise in the application of satellite tags in the Inuvialuit Settlement Region.

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203 **Fisheries**

Johnston, Tom
Department of Fisheries and Oceans
867 Lakeshore Drive
Burlington, ON L7R 4A6

File No: SLE-02/03-215
Location: Trout Lake 60°35'00" 121°19'00"

Objectives: To determine the fecundity of certain adults in a walleye spawning stock and ascertain which fish are more likely to produce the most offspring.

204 **Fisheries**

Low, George
Department of Fisheries and Oceans
42043 Mackenzie Highway
Hay River, NT X0E 0R9

File No: SLE-02/03-211
Location: Unnamed (Ekali/Kelly) Lake 61°17'00" 120°34'00"

Objectives: To collect samples to determine condition factors and mercury levels in fish species.

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205 **Fisheries**

Low, George
Department of Fisheries and Oceans
42043 Mackenzie Highway
Hay River, NT X0E 0R9

File No: SLE-02/03-218
Location: Tathlina Lake 60°33'00" 117°32'00"

Objectives: To assess the stock structure of the walleye population and determine a total allowable catch and commercial quota.

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206 **Fisheries**

Low, George
Department of Fisheries and Oceans
42043 Mackenzie Highway
Hay River, NT X0E 0R9

File No: SLE-02/03-221
Location: All waterbodies in the Sahtu, Deh Cho, North Slave, South Slave and Great Slave Lake.

Objectives:

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207 **Fisheries**

Stephenson, Sam
Department of Fisheries and Oceans
Box 1871
Inuvik, NT X0E 0T0

File No: SLE-02/03-275
Location: Mackenzie River and Beaufort Sea

Objectives: To collect or purchase samples of various species for scientific, contaminant and disease/parasite analysis. Studies will include age and growth rates, fecundity and sex ratios. Samples of vagrant species will also be collected for positive identification and range distribution.

208 **Fisheries**

Tallman, Ross
Department of Fisheries and Oceans
501 University Crescent
Winnipeg, MB R3T 2N6

File No: SLE-02/03-235
Location: Keith Arm 65°10'00" 123° 00'00" on Great Bear Lake

Objectives: To gather baseline data on size, age, fecundity, growth and mortality to compare productivity of stocks in different parts of Great Bear Lake. These data will also be used to assess the lake trout stocks. Tissue samples will be collected and analyzed to determine stock movements.

209 **Fisheries**

Tallman, Ross
Department of Fisheries and Oceans
501 University Crescent
Winnipeg, MB R3T 2N6

File No: SLE-02/03-236
Location: Dease Arm 66°45'00" 123°00'00" on Great Bear Lake

Objectives: To gather baseline data on size, age, fecundity, growth and mortality to compare productivity of stocks in different parts of Great Bear Lake. These data will also be used to assess the lake trout stocks. Tissue samples will be collected and analyzed to determine stock movements.

210 **Fisheries**

Tallman, Ross
Department of Fisheries and Oceans
501 University Crescent
Winnipeg, MB R3T 2N6

File No: SLE-02/03-237
Location: Smith Arm 66°10'00" 123°30'00" on Great Bear Lake

Objectives: To gather baseline data on size, age, fecundity, growth and mortality to compare productivity of stocks in different parts of Great Bear Lake. These data will also be used to assess the lake trout stocks. Tissue samples will be collected and analyzed to determine stock movements.

211 **Fisheries**

Tallman, Ross
Department of Fisheries and Oceans
501 University Crescent
Winnipeg, MB R3T 2N6

File No: SLE-02/03-238
Location: McVicar Arm 65°30'00" 120°00'00" on Great Bear Lake

Objectives: To gather baseline data on size, age, fecundity, growth and mortality to compare productivity of stocks in different parts of Great Bear Lake. These data will also be used to assess the lake trout stocks. Tissue samples will be collected and analyzed to determine stock movements.

212 **Fisheries**

Tallman, Ross
Department of Fisheries and Oceans
501 University Crescent
Winnipeg, MB R3T 2N6

File No: SLE-02/03-239
Location: McTavish Arm 66°00'00" 118°00'00" on Great Bear Lake

Objectives: To gather baseline data on size, age, fecundity, growth and mortality to compare productivity of stocks in different parts of Great Bear Lake. These data will also be used to assess the lake trout stocks. Tissue samples will be collected and analyzed to determine stock movements.

213 **Fisheries**

Tyson, David
Department of Fisheries and Oceans
Suite 101 Diamond Plaza
5204-50th Ave
Yellowknife, NT X1A 1E2

File No: SLE-02/03-213
Location: various waterbodies throughout the Northwest Territories

Objectives: To provide timely support for investigations of habitat impacts, prevent or mitigate impacts on fish by relocating and to take other action to prevent, mitigate and/or investigate impacts on fish and fish habitat.

GLOSSARY OF SCIENTIFIC TERMS

Active layer	the area where the soil freezes and thaws above the permafrost
Aeration	pumping air into a medium
Aeromagnetic survey	surveys from aircraft that make use of the magnetic field caused by magnetized rocks in the Earth's crust to make estimates about underlying geology of a given area such as distribution of potential resources
Algae	simple living things that are composed of one or more cells. Most algae are similar to plants that do not have roots or flowers
Alkali	a soluble salt obtained from the ashes of plants and consisting largely of potassium or sodium carbonate
Analytical	a detailed examination of the structure or some other parameter of a substance or thing
Anatomy	the science that deals with body structures of animals or plants
Anoxic	a situation where oxygen is present in very low amounts or not at all
Anthropogenic	of, relating to, or resulting from the influence of human beings on nature (ie: source of pollution)
Anthropometric	measurements of the body
Anticline	a folded upward rock that has a center that contains stratigraphically older rocks
Aquatic Biota	all living organisms in the aquatic environment
Archival	pertaining to a collection of documents
Arsenic	a chemical element that is gray in colour and that is highly poisonous with no taste
Artifacts	an old tool, weapon or other human-made thing from the past
Asexual	an organism that reproduces without the aid of a partner and who passes on all of its genetic information
Asphodel	a herb like plant
Assessed	from observations, estimated result(s) of the outcome are made
Attributed	giving a cause to affect or outcome
Aufies	ever-thickening sheets of ice formed by springs that freeze in layers 2 - 5 meters thick over existing river ice, often breaking away to become navigational hazards
Autoecology	the branch of ecology that deals with the biological relationship between an individual organism or an individual species and its environment
Awl	a tool that is pointed for poking holes in leather or wood
Bacteria	tiny living single cells that can only be seen through a microscope

Baseline	the standard
Benthic	organisms that live at the bottom of a body of water
Benthos	the bottom of the ocean or body of water
Bentonite	a rock composed of clay-like material formed by volcanic ash or tuff. Bentonite beds are common in shade or limestone from the Paleozoic time
Biochemistry	study of chemical processes in living organisms
Biodiversity	pertaining to the variety of species in an area
Biogenic	produced by living organisms or biological processes
Biogenic emission rates	the speed that volatile organic compounds are released into the surrounding environment
Biogeography	the science that deals with distribution of all living organisms
Biomass	the total amount of all living material within a specific volume of the environment
Biomes	distinct areas of the Earth that are common in climate conditions, life forms and physical features like the tundra or woodland
Biostratigraphy	identification and differentiation of rocks based on the types of fossils they contain
Bituminous	a term used to describe many forms of solid/semi-solid hydrocarbons that are either synthetic or found in nature
Brachiopods	marine invertebrates characterized by their filamentous feeding organs and two bilaterally symmetrical valves that make up its shell
Brittle stars	a marine organism belonging to the same family as sea stars and sea urchins that is commonly fond in Arctic regions in shallow waters
Calcrete	a mix of gravel and sand cemented by calcium carbonate
Carnivore	a flesh eating animal
Characterized	to describe something
Chlorophyll a	a pigment in plants that give them their green colour and which absorb energy from the sun. Plants use Chlorophyll to change carbon dioxide and water into food and oxygen
Classification	organize into groups or categories
Cockles	a sea clam used for food with a shell that looks like a heart
Compliance	an agreement with something
Comprehend	being able to understand
Comprehensive	conveying or including everything or almost everything
Coniferous woodland	a wooded area that is dominated by evergreen trees
Conifers	a group of woody plant commonly known as evergreen trees such as pine, spruce or fir that bears cones

Connectivity	how well something is able to connect or relate with another thing
Convection	a transfer of heat through a gas or liquid by currents
Coral	a hard substance like stone found in tropical seas. Coral is made from the skeletons of tiny marine organisms
Core	a part removed from the interior of a mass especially to determine the interior composition
Correlated	a mutual relation between two comparable things
Cosmopolitan	consisting of a group of individuals from around the world
Cretaceous	the last period of the Mesozoic Era, ranging from 140 to 65 million years ago
Crinoids	a sea urchin that has feathery arms
Cumulative	things that add together
Dark septate endophytes	tiny fungi that grows underground into tree roots
Deducing	draw a conclusion
Deformation	a measurable change in structure
Degradation	to reduce something or to place something at a lower level
Density	a quantity of mass per unit volume
Devonian	a period between 410 and 370 million years ago when terrestrial plants began to spread across the land as well as much development in aquatic animals such as fish and other shell fish
Diamiction	glacial soils with clay, sand, gravel and boulders mixed together
Diatom	microscopic one-celled marine or fresh water alga having cell walls that contain silica (a white colorless glass-like solid that doesn't dissolve)
Disjunct	refers to separate societies
Diversion	a changing of the direction in which something is going
Dorsal fin	the fin on an aquatic animal that is located on its back
Ecology	the science that deals with how living organisms live in relation to each other and their environment
Ecological integrity	ensuring the relationship in plant and animal communities remains healthy
Ecophysiological	pertaining to an individual organism's response to the factors in the environment such as temperature
Ecosystem	living organisms and non-living structures that work together to form a system
Effluent	something that flows out from a main source, such as sewage or waste matter
Electro-fishing	using electricity to stun and kill fish, usually used during scientific scenarios
Electromagnetic	magnetism that is caused by electricity
Emissions	something that is radiated outward or discharged from a source

Endophytes	a plant that grows underground or under a tree
Eocene	a time when small mammals began to develop on Earth between 54 and 38 million years ago
Epoch	a period of time during which something important developed or happened
Erosion	group of natural processes (weathering, disintegration, abrasion, corrosion, transportation) where the Earth's surface is worn away and removed
Eskers	a long, narrow ridge of coarse gravel deposited by a stream flowing under a decaying glacial sheet of ice
Estuary	a place where coastal seawater comes into contact with the current of a freshwater stream
Evolution	a process where different species come into existence by differentiation and genetic mutations from common ancestors over a long period of time.
Excavated	extracting or revealing something by removal of the surrounding earth
Extant	organisms that are still present on the Earth today
Fauna	animal life of a particular region, environment, or geological period
Fibril	a smaller unit of an individual fibre
Flora	the plants of a particular region, environment or geological region
Fluvial	pertaining to something's existence or growth around a stream or river
Fossil	trace of an organism of a past age, embedded and preserved in the Earth's crust
Fungi	a kingdom of heterotrophic organisms that produce spores
Gas hydrate	a crystal structured solid, whose building blocks consist of a gas molecule surrounded by a cage of water molecules
Gastropod	an organism that characteristically has a single, usually coiled shell or no shell at all, a ventral muscular foot for locomotion, and eyes and feelers located on a distinct head
Gender	one's characteristics or traits determined socially as a result of one's sex
Genetic	pertaining to an organism's traits or characters being linked to genes
Genera	a group of organisms that share common characteristics
Geochemistry	a science that deals with the chemical composition of and chemical changes in the solid matter of the Earth
Geochronological	the chronology of the earth's history as determined by geologic events and not by human history
Geomorphologic	pertaining to the physical features of the Earth's surface
Glacial refugia	an area isolated by glaciers where little environmental change took place
Glyptostrobus pensilis	a species of conifer that has the common name of water pine
Gneisses	a banded or foliated metamorphic rock, usually of the same composition as granite

Grams	a unit of measurement for mass
Granitic rock	light colored coarse-grained rock that was formed at great depths such as quartz
Habitat	a place where organisms can live
Heterogeneous	a situation where something is in a mixed composition
Holocene	the most recent 11,000 years of the Earth's history starting at the end of the last major ice age, which has been relatively warm
Host specificity	how selective a parasite is when looking for a host to live on as a source of food
Hydraulic	pertaining to movement caused by water
Hydrology	science dealing with the properties, distribution and circulation of water
Implemented	to put into effect
Inoculated	to introduce to an organism
Iron	a metallic element used for making tools and essential for all living organisms' survival
Kitigaaryumiut	the traditional gathering place where the Kitigaaryumiut people would hunt beluga and hold celebrations
Larix	a genus of boreal trees commonly known as Larch, the range of which includes the circumpolar region and some mid-high altitudes in the south
Larvae	a premature stage for an insect where it feeds a lot before it becomes a pupa
Latitude	a measurement of the angular distance from the equator to a given point on the Earth's surface
Lenticular	resembling the shape of a cross section of a lens
Liliaceae	a family of mostly perennial herb-like plants with about 280 genera and 4,000 species
Limestone	a sedimentary rock that contains mostly calcium carbonate and can be formed by either inorganic or organic processes
Limnology	the scientific study of the life and phenomena of fresh water, especially lakes and ponds
Manganese	a metallic element that is used to make alloys
Metamorphosed rock	any rock derived from pre-existing rocks by changes in response to environmental factors such as temperature, pressure and shear stresses
Metasquoia	a Dawn Redwood that belongs to the conifers
Methane	the simplest hydrocarbon that is the main ingredient in natural gas
Microbes	bacteria that can cause disease
Microclimate	the climate close to Earth's surface or the climate of a small area
Microfossils	a very small fossil that needs the aid to a microscope to view it
Microorganisms	organisms that must be viewed under a microscope, such as bacteria or a virus

Migration	the long range movement of a group of animals based on the seasons
Molecular analysis	a detailed look at the chemical structure and properties of a molecule
Moraine	a mound of rock debris carried and deposited by a glacier
Morphometric	measurements taken at designated places to compare individuals of a species
N-butanol	an isomer of the alcohol butanol - C_4H_9OH
Nested plots	in an experiment, designated areas are placed out along a transect line to gather data
Oligotrophic	a pond or lake lacking in plant nutrients and having a large amount of dissolved oxygen throughout
Organic	material pertaining to plants or animals
Outcrop	a portion of bedrock or other stratum protruding through the soil level
Overlie	sedimentary or volcanic rock that lays on top of older rock
Paleo-Eskimo	the people who migrated across the north around 2000 years ago. It is not known if they are the ancestors of the modern Inuit.
Paleoecological	a relationship or study of ancient organisms and how they related to their ancient environment
Paleoenvironmental	an environment that existed in the past
Paleohydrological	a study regarding the ancient water features preserved in rocks
Paleolimnological	a study regarding the ancient lake conditions by looking at its sediment
Parameter	one set of measurable factors, such as the temperature and pressure, that define a system and determine its behavior and are varied in an experiment
Parameterized	expressing something in terms of a parameter
Pertinent	something is relevant to the topic
Physiological	pertaining to the physical structures and functions of living organisms
Phytoplankton	a group of plant-like plankton that all sea animals depend on either directly or indirectly
Pixel	a single unit of a television or computer screen that is responsible for the picture
Pleistocene	an age of notable ice ages and development of humans between 2,000,000 and 10,000 years ago
Pluton	an intrusive rock, as distinguished from the preexisting country rock that surrounds it
Polycycle thaw slump	a depression with underground drainage that reflects many base-leveling for more than one sea-level
Postglacial	relating to or occurring during the time following a glacial period
Putative	to assume something

Qualitative	complete detailed descriptions usually taken from a small sample that allows for distinctions to be drawn from the data
Quantitative	use of large amounts of data where statistics can be applied to interpret the data
Radiocarbon dating	the determination of the approximate age of an ancient object, such as an archaeological specimen, by measuring the amount of carbon 14 it contains
Raptor	a bird of prey such as an eagle, falcon or osprey
Reef	a structure formed by coral and its remains that lie above the bottom sediment
Reticular	a system that adopts a network design
Revitalization	to give new life or vitality to something
Sandstone	sedimentary rock that contains fine-grained fragments that are firmly cemented together
Satellite imagery	computer images generated by a satellite which allow researchers to look at a specific area and monitor surface features such as vegetation
Sediment	solid fragment material that occurs from the weathering of rocks. In water it is material that has settled from a state of suspension
Sedimentary rock	rock derived from loose particles that have accumulated over time
Sedimentation	the process where small particles are moved and deposited to accumulate into layers
Seiche events	an environmental event such as pressure or especially high winds that generate a change in a lakes water level or wave level
Seismic	pertaining to vibrations in the Earth, both natural and induced
Shovel testing	a crude test where a sample of ground is taken by use of a shovel
Siliciclastic	non-carbon based sediments that are broken from preexisting rocks, transported elsewhere, and redeposited before forming another rock
Siltstone	silt having the texture of shale
Skeptical	to have doubt
Solutes	a substance that has dissolved
Species	a group of organisms that share common characteristics that group them together and also distinguish them from others
Sponges	aquatic organisms that characteristically have a porous skeleton composed of fibrous material and often form colonies attached to an underwater surface
Stone flakes	debris left over from a rock while making tools
Stratified	a system that is set up in layers or strata
Stratigraphic	formation of rock where different layers can be picked out based on type and age of the rock
Subsidence	to flatten out so as to form a depression; to sink or fall to the bottom

Succession	a progressive change in the biological community as a result of a response from species to the changing environment
Surficial	pertaining to something that is on the surface
Suspension	a situation where the medium is able to support the weight of the particles trapped inside it
Systematic	done according to a plan
Thermatic	pertaining to a cause of heat
Thermokarst	sinking holes, caves and underground drainage that are produced in regions with permafrost from melting of ground ice and settling of the remaining ground
Thermokarst lakes	lakes where water is trapped in a cut off karst region
Thule Eskimo	a culture which arose in Northwest Alaskan about 1100 years ago. They are considered to be the ancestors to many of the modern day Inuit.
Topography	a description of the surface of a given area
Trace metals	a metal that is not essential in the sample but is found in small quantities
Tracheid	a pitted long cylindrical tube in the xylem of a plant used for water conduction
Transect	an imaginary line across a surface where observations are made
Tributary	a place where a stream feeds into a larger stream or lake
Trilobite	an ancient group of marine organisms that represents some of the oldest arthropods known and whose fossils are often found in rock
Turbid	stirred up material suspended in a medium leaving it unclear and opaque
Unconformity	a large break in the chronological sequence layers of rock
Vascular plants	a group of plants that have developed a good conductive system and that have structural differentiation
Velocity	rate of occurrence or action; quickness of motion
Volatile	an easily vaporized compound
Watershed	the region draining into a river, river system, or other body of water
Younger Dryas	the most significant rapid climate change event that occurred during the last deglaciation of the North Atlantic region

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