Environment Canada Environnement Canada

The Effects Monitor

Environmental Effects Monitoring Newsletter for the Atlantic Region

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Community-Based Water Quality Monitoring

Water quality monitoring has traditionally been carried out by regulatory agencies, regulated industries or by researchers at government and academic institutions. In recent years, public environmental interest groups have become more active in influencing decision making in government, to the point where, in the United States, some 12,000 volunteer groups routinely carry out environmental quality monitoring.

Through the Atlantic Coastal Action Program (ACAP), multi-stakeholder groups are building a sense of community involvement and ownership in their local watersheds, rivers, estuaries, and coastal environs. At every ACAP site, there has been a strong desire to carry out community planning, but an even stronger desire exists to go out and "do something" constructive in the short term. A common response that has emerged is to implement community-based water quality monitoring. The Canada-New Brunswick Water/Economy Agreement was viewed as a mechanism by which community-based water quality monitoring pilot projects could be supported. A proposal was prepared and annual support of $25,000 was obtained from the Agreement for 1993 and 1994.

Due to expressed interest from four established ACAP sites in New Brunswick, water quality monitoring pilot projects were initiated at Madawaska, Miramichi, St. Croix and Saint John. The pilot projects presented opportunities to develop a product that could meet the desire of other ACAP groups to operate an action oriented project. Each of the four pilot projects successfully implemented a community based monitoring pilot study that was designed for the priority water issues in their respective communities. While no two were identical, there were similarities in approaches between the sites.

A guidance document entitled - ***Monitoring Surface Water Quality: A Guide for Citizens, Students, and Communities in Atlantic Canada*** was prepared by staff from Environment Canada, New Brunswick Department of the Environment, New Brunswick Community College and Huntsman Marine Sciences Centre. Information from Environment Canada, the United States Environmental Protection Agency, the University of Maine Cooperative Extension Program and from volunteer groups were incorporated.

Positive feedback from volunteers in the project included: community involvement and participation was important; good background data had been gathered; there was a better understanding of the effort and cost of environmental monitoring; the data were independent of government or industry; and the information could be used as a basis to monitor changes in water quality.

For further information or to obtain a copy of the guidance document contact:: Hugh O'Neill (506) 851-6606

Water Quality Monitoring at the Hibernia-Bull Arm Construction Site

In the fall of 1990, construction of the gravity-based structure (GBS) and one of five topside modules began at the Bull Arm site, which is on the Isthmus of Avalon, off Trinity Bay. A great deal of marine construction work was required to prepare the site, including underwater blasting, dredging and ocean disposal of dredge spoils in Great Mosquito Cove at an Environment Canada approved site. All of these activities have the potential to introduce sediment into the water column and this was a concern to commercial

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inshore fishers in lower Trinity Bay. Accordingly, the Hibernia Management and Development Corporation (HMDC) established a water quality monitoring program to detect any increases in total suspended solids (TSS) and/or turbidity in Bull Arm. This program was intended to be an early warning system, so that appropriate mitigation could be put in place to avoid impacts on the commercial fishery.

In June 1991, HMDC initiated a weekly sampling program in conjunction with local inshore fishers who were trained in proper water quality sampling techniques. Sampling from June to October has continued each year since 1991 and an interpretative report on the results is made available shortly after the last samples of the season are collected.

Surface and mid water-column samples were collected by local fishers at 8 locations in Bull Arm and analyzed for turbidity and TSS. Two additional near field stations were added in 1992 and one station was moved to better coincide with the larger environmental monitoring program. The water quality monitoring program was expanded in 1994 to include bottom sampling and additional stations near the ocean disposal location in anticipation of increased activity due to the removal of the berm around the GBS site.

Over the sampling period 1991-93, data analyses has supported the original null hypothesis that sedimentation to marine habitats and the water column of productive fishery areas should not consistently exceed the maximum acceptable environmental limit (MAEL) which was established as 30 mg/L of TSS and 5 NTU for turbidity. The results for the 1994 season are not yet available, however preliminary results indicate that despite the activity in Great Mosquito Cove this summer, neither parameter exceeded the project-specific MAEL's at any of the sample location.

For further information, contact:
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Status of EEM Studies at Atlantic Region Pulp Mills

In July and August, 1994, the Regional Authorization Officer issued approvals for six environmental effects monitoring programs at pulp and paper mills in the Atlantic provinces:

- **Minas Basin Pulp and Power and CKF Inc. in Hantsport, N.S. for a joint study;**
- **Miramichi Pulp and Paper, Newcastle and Nelson, N.B. for a joint study for the two plants.**
- **Lake Utopia Paper in St. George. N.B.**
- **Bowater Mersey Paper Company in Liverpool, N.S.**
- **Fraser's Inc. in Edmundston, N.B.**
- **Conditional approval was granted to the Nova Scotia Department of Supply and Services for an environmental effects monitoring study at the Boat Harbour Waste Water Treatment Facility in Pictou County, N.S. pending a decision on the location of a new effluent pipeline and diffuser in the Northumberland Strait.**

In September and October, field work was conducted at several of the mills that had received approval. Sampling took place in the Saint John River near the Fraser's mill, in the Minas Basin adjacent to the two mills in Hantsport; in the L'Etang Estuary near the Lake Utopia mill and in the Miramichi River around the two Miramichi Pulp and Paper mills.

The pre-design study report and the design proposal for the environmental effects monitoring program at the St. Anne-Nackawic Pulp Company Ltd. was received by Environment Canada in October. All of the remaining pulp and paper mills in the Atlantic provinces have contracted consultants to prepare their pre-design reports and EEM study designs and these are expected to be submitted to Environment Canada in the next few months.

For further information, contact:
Roy Parker (902)426-8564

Environmental Monitoring Program at the Cohasset-Panuke Oilfield

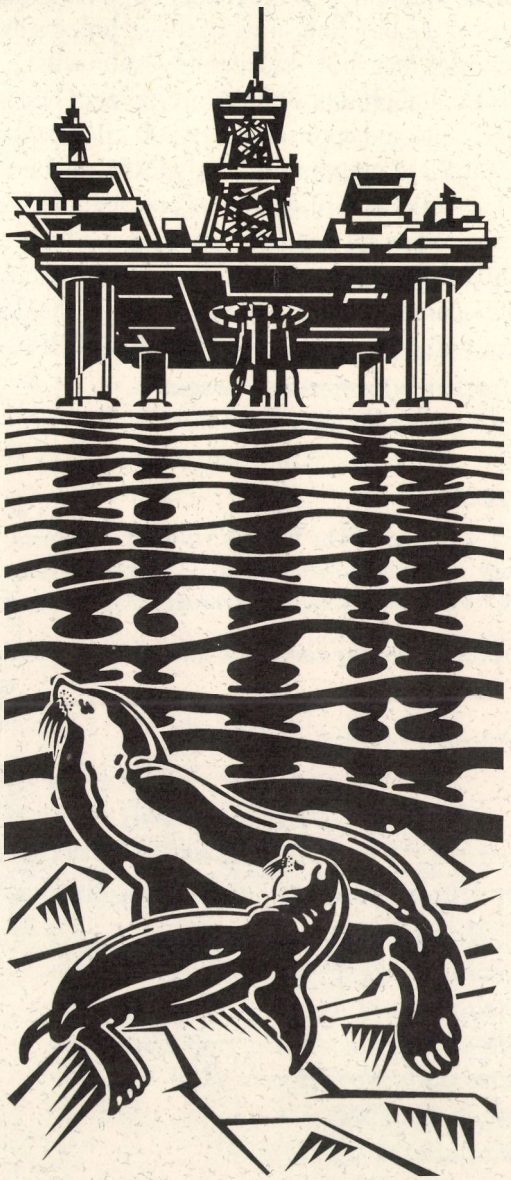
LASMO (Nova Scotia) Ltd. recently released preliminary results of an environmental monitoring study that was conducted in 1993 to assess potential environmental impacts from the discharge of oil-based mud drill cuttings. The Canada-Nova Scotia Offshore Petroleum Board required the company to conduct the monitoring program as part of the decision to allow the use of oil-based drilling fluids at the Cohasset site. The monitoring program consisted of three components: measurement of the oil content of the drilling wastes discharged from the drilling platform; an assessment of the benthic invertebrate community; and an evaluation of shellfish tainting.

Two benthic community surveys were conducted; the first in May before drilling was started and the second in December, after drilling had been completed. Samples were collected along two straight lines at bearings 070° T and 340° T from the drilling rig. These transects represent the main downstream current directions during storm events and due to tides. Sampling along these transects started 140 metres from the drill rig and extended out to 5000 metres from the platform. The results of these two surveys indicated that the benthic communities in this area of the Scotian Shelf are extremely variable in terms of number of species, number of organisms and other common evaluation criteria. There was no indication of any impacts on the benthic community as a result of the discharge of the drilling wastes.

In April, 1993, blue mussels were acquired from aquaculture facilities in Nova Scotia, transported to the site and placed in cages suspended in the water column near the drilling platform. At regular intervals over the next 9 months, the cages were retrieved and a sample of mussels was removed. These samples underwent tainting evaluation at the Technical University of Nova Scotia and were also analyzed for oil content. The testing panel determined that there was a difference in taste and odour between mussels held within 500 metres of the drilling rig and fresh mussels from an aquaculture facility. The panel did not indicate that there was an unpleasant or unacceptable flavour or odour from the mussels held offshore, only that they tasted and smelled different from the mussels taken from a near shore aquaculture facility. Chemical analyses of the mussel tissue indicated the presence of low concentrations of oil in the tissue of mussels held at location near the rig.

For 1994, the shellfish tainting studies and measurements on the oil content of drilling wastes have been continued. Since the results of the benthic community assessments were so variable and inconclusive, LASMO has requested that this component of the program be discontinued. In conjunction with Environment Canada, toxicity tests will be conducted on samples of sediment collected near the drilling platform. A final report on the 1993 monitoring results will be available in January, 1995.

For further information, contact:
Cal Ross, LASMO (Nova Scotia) Ltd. (902)422-4500.



Hibernia Offshore Environmental Effects Monitoring Baseline Study

The Hibernia Management and Development Company Limited (HMDC) carried out the first field work in September for the baseline study of its offshore EEM program. The program design included extensive consultation with regulatory agencies and the public during the spring of 1994 and the baseline study design was accepted by the Canada-Newfoundland Offshore Petroleum Board (CNOPB) in August, 1994. The program includes trace metal and petroleum hydrocarbon measurement in sediments; sediment toxicity assessment using a suite of toxicity tests; and body burden and taint detection in flounders and scallops.

The sediment sampling took place between August 31 and September 10, 1994 from the supply vessel Tignish Sea. Using a cylindrical box corer, 167 samples were collected at 47 locations covering a distance of up to 16 kilometres from the future production site. To date, all samples have been screened using the Microtox assay on both the solid and pore-water phases. A subset of the samples (minimum 16%) is presently being evaluated using amphipod acute toxicity tests and sea urchin fertilization assays.

The National Research Council is assisting HMDC in pre-qualifying laboratories for the chemical analyses portion of the baseline study of the sediments by providing interested labs with reference materials to analyze. The laboratories that show acceptable results will be invited to bid on the sediment analyses package. HMDC and NRC are also collaborating on the development of a new standard reference material (SRM) for Grand Banks sediment. HMDC collected approximately 800 kilograms of additional sediment during the baseline survey and provided it to NRC for SRM preparation. This SRM can be used for future offshore analytical requirements.

The collection of flounders and scallops has not been completed, but it is expected to be done in the next few months. When all the data becomes available and is analyzed, HMDC will be submitting a baseline report to the CNOPB. This report will be useful in determining appropriate maximum acceptable environmental limits (MAEL's) for the operational phase of the project. The design of the EEM program for the production phase of the Hibernia project will require approval from the CNOPB.

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Correction

In the last edition of **The Effects Monitor** (Volume 1, Number 2), a typographical error occurred in the article about mercury contamination from pesticide use on golf courses. In the third paragraph of the article, the concentration units should have been reported as micrograms per kilogram (ug/kg) not grams per kilogram (g/kg).

We apologize for any confusion this error might have caused.

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The Effects Monitor will be published quarterly by Environment Canada, Atlantic Region. Anyone interested in receiving a copy of the newsletter, submitting an article for the newsletter or making any comments or suggestions, should contact:

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