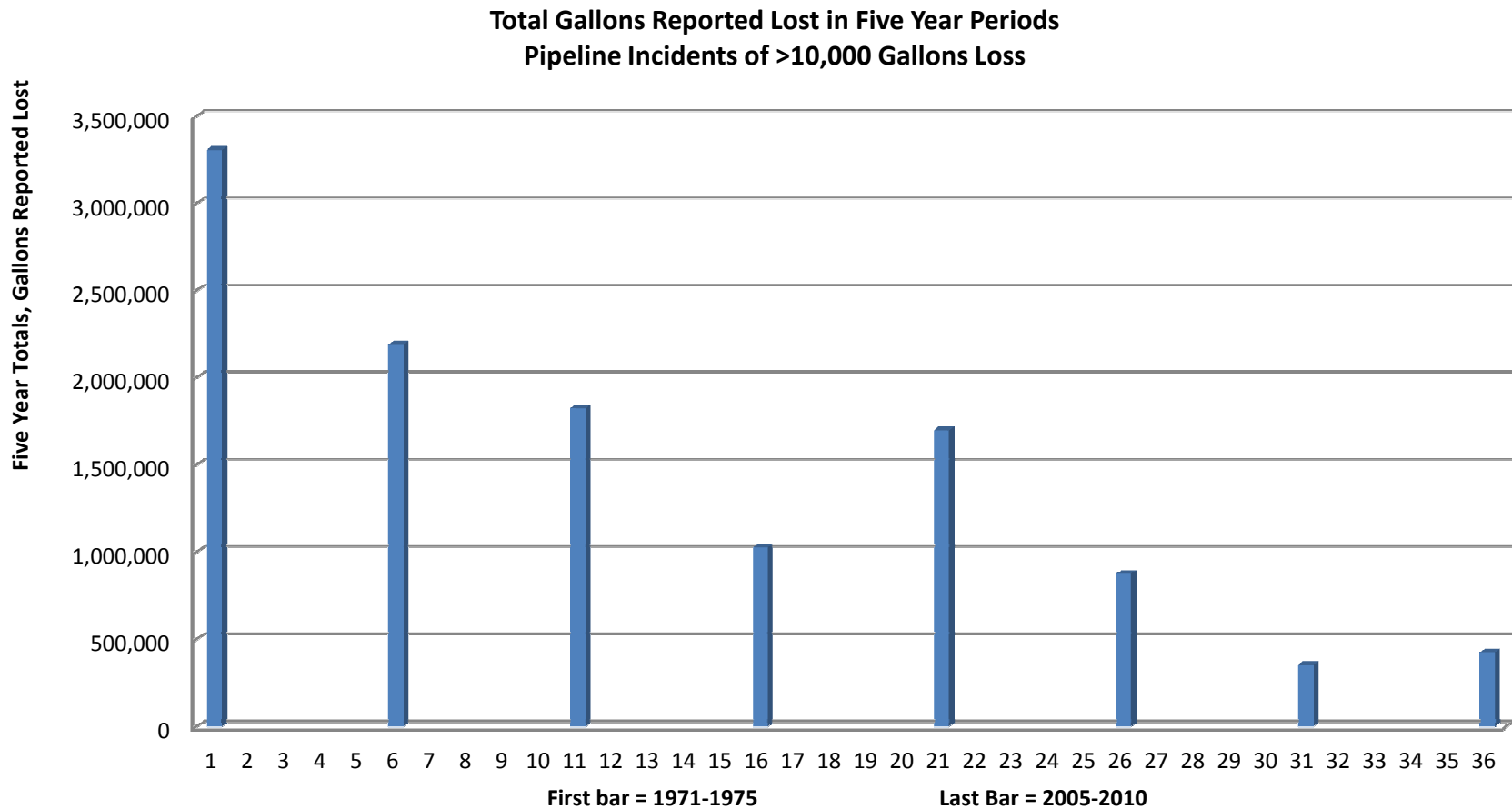


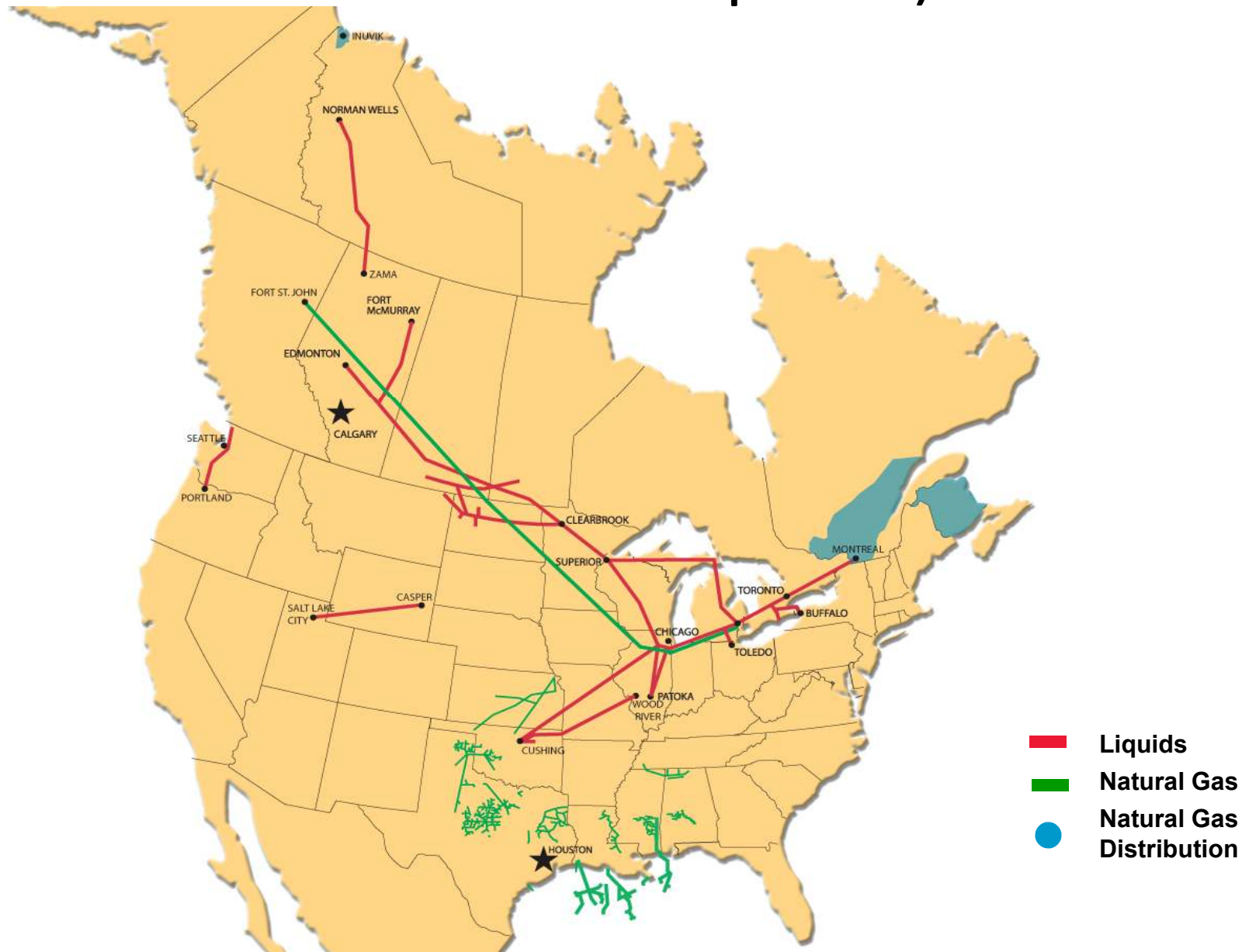
National Crude Oil Spill Fate and Natural Attenuation
Research Site. Thirty years of science.
The Pinewood site near Bemidji



Pipeline Spills >10K gallons



The Enbridge Pipeline System (formerly Lakehead Pipeline)



Canada to Clearbrook, then Superior and East

- First line built in 1950; expansions over time.
- Pipe in Mn. diameters of 18" to 48"
- Transports crude oil from western Canadian and North Dakota to Midwest markets.
- >2.0 Million barrels per day total – about 13% of the total U.S. crude oil imports)



Crude oil

The crude oil, under approximately 400 pounds pressure at the point where the pipeline broke, evidently blew a small hole in the ground and gushed out for a short time until the pipeline was shut down by remote control from Edmonton, Alberta.



Effects of spill

A small rabbit showed the effects of the Lakehead Pipeline oil spill near Pinewood.

In June the council finally awarded a sewer and water project to North Central Undergrasud, M. Coud. The company successfully obtained a court order to block an award to another bidder and the apparent low bidder agreed to accept a cash settlement from North Central and the hospital.

At the hearing, for which no date has been set, City Manager Dan Daugherty will function as a hearing examiner and all interested parties will be allowed to testify. Daugherty will then make a recommendation to the council.

The council also agreed to postpone hearing a bid to extend sewer service in Diamond Point Park until after the hearing because Sevede has also bid on that project.

The council also set a public hearing Sept. 17 to consider a \$1.6 million industrial revenue bonding proposal for the Holiday Inn.

The Holiday Inn plans to add four banquet rooms and between 23 and 40 rooms in a larger convention.

However, the council added the stipulation that it was not approving or disapproving the proposal at this time. Several council members also questioned whether the hearing should be held until the Holiday Inn can meet the requirements for obtaining municipal revenue bonds.

Doug Carr, attorney for the motel, told the council that his client could not meet a provision requiring its net revenue for the past two years to be equal to the total of its debts, including the proposed bonds.

"It looks like we're doing things in reverse," said councilman Henry Hessler.

(Continued on page 2)

Mostly cloudy, chance of showers and thunderstorms through Wednesday. High Wednesday mostly in the 70s. Low tonight upper 50s to middle 60s. Winds southeast to east 10 to 15 mph tonight. Probably a 1 to 2 inch precipitation 48 percent tonight and Wednesday.

Lakehead pipeline bursts near Pinewood

By JODY GRAU
Staff Writer

A crude oil pipeline owned by the Lakehead Pipeline Co. burst Monday morning about one and a half miles southeast of Pinewood sending up a geyser of oil which sprayed about ten acres of state-owned jackpine forest land.

The break in the line which runs from Edmonton, Alberta, to Superior, Wis., was reported to the company by a Gas Line maintenance man but the company's superintendent, Tom Gray, said the drop in pressure had already been monitored.

"I had already made the call to have the line shut down when we received the report," Gray said. He added that the portion of the line which is shut down lies between Clearbrook and Superior.

The oil settled into depressions along the Old Fossion Trail forming four pools. The largest of these formed at the break in the line and measured about 75 feet across and about two feet deep according to Willis Mattison, Detrick Lakes regional director of the state Pollution Control Agency.

Mattison said the only surface water apparently affected was a nearby sphagnum bog and that the major environmental concern would be to minimize the possibility of

contaminating ground water by cleaning up the spill as quickly as possible.

Lakehead dispatched a clean-up crew immediately following the blow out at about 9:45 a.m. and began pulling oil tankers into the area to transport the liquid spill.

Gray said the liquid would be taken to the pump station at Clearbrook and injected back into the other two Lakehead lines. He added that cleanup operations would go on throughout the night.

Mattison reported late yesterday afternoon that eight 8,000 gallon tankers had been filled and that the line was still draining oil. He also estimated that the oil had penetrated about eight inches into the sandy soil.

Jim Mattison, a wildlife biologist for the Federal Fish and Wildlife Service, said that from what he could see yesterday afternoon the impact on area wildlife would be small.

Although it's possible that waterfowl might mistake the oil for water when they come in to land for the evening, according to Mattison, the number of birds that might be affected would be small. He added that the spill would probably have very little or no effect on deer and other wildlife.

W.C. Cochran, general manager of Lakehead, said they had no way of

knowing what caused the line to burst until they could uncover the line.

"The line was not operated in excessive pressure according to all of our readings," Cochran said.

Cochran added that another line breakage had occurred about six years ago but that all the lines had been hydrostatically tested following that incident.

Clean-up workers will probably be working at the spill site for more than a week, according to Cochran, but around the clock efforts will cease as soon as all the liquid has been pumped up.

Retains DFLer lawyer for case—

Employer claims conflict, fires Republican lawmaker

ST. PAUL (AP) — A Minnesota lawmaker has been fired from his job as a district insurance manager because the company says he can't handle both lawmaking and insurance duties.

Rep. John S. Bierdorf, Owatonna, said he was terminated by Federated Insurance Companies after 13 years as a district manager.

He said the company believes he is a fulltime legislator and can't perform both jobs.

The action could precipitate the first test of a 1974 law that appears to safeguard the private industry jobs of Minnesota legislators.

Bierdorf, an Independent-Republican, has retained the legal services of state Rep. Harry Sieben, a DFLer from Hastings who serves as DFL leader in the House.

Sieben declined to say what action might be taken. Bierdorf, 54, has been with the Owatonna company for 13 years. He was elected in 1976 and said an arrangement was made at that time under which some, but not all, of his business accounts were assigned to other sales personnel.

"While you're up here, you can't sell as much as I've always felt I've been able to handle the service of my accounts," Bierdorf said in an interview.

The 1974 law says that any legislator who held a permanent job with a private employer when he entered legislative service "shall be continued or restored to such position, or to a position of like seniority, status and pay."

The law says the restoration to a private job must be done.

(Continued on page 2)

Soviet purchases

WASHINGTON (AP) — purchases of American goods by the year ending Sept. 30 reached a record 15.5 million dollars, the Agriculture Dept. reports.

The department announced Monday that the year's total so far include 5.98 million wheat and 11.68 million corn.

Young supporters

UNITED NATIONS (AP) — supporters of Andrew Young's meeting with Israeli ambassador today recognition of Palestine Monday they told the Liberation Organizational representative that the rights of both the Jewish and Palestinian homelands.

Officials of the Christian Leadership Conference had lunch Monday with U.N. observer, Zehdi L.

(Details on page 2)

Bank robberies

NEW YORK (AP) — old bank teller is the last in an exploding New York bank robbery rate. He occurred recently at the a day — more than 10 weeks.

Daniel Tishman was down Monday during robbery in three years a branch of the European Bank, police said. The robbers wore a monkey mask with 12,433.

August 20, 1979 Bemidji Pioneer

Soviets setback

WASHINGTON (AP)—U.S. intelligence officials say Nigeria, one of Africa's most important countries, has told Russia to reduce sharply the size of its military training mission there. This is regarded as a significant setback for the Russians in a country that is a major source of oil for the United States. Intelligence specialists who asked not to be named said the development is the result of long-festering Nigerian military discontent with the Soviet mission.

Board seeks more city funding

The price of a book has just about doubled, according to Bears chairperson Louis Marchand, and the board has not been able to purchase all the materials it would like to.

Under the funding proposal the rate of contributions from member cities and communities would be a minimum mill rate set by state statute, said Marchand, a more uniform system than that currently used.

However, Bemidji's share of the funding would fall under \$27,394 with the new system, according to Marchand. The city will again be requested to contribute this figure, he said, because the contract provides that no member will pay less than in the previous year.

In about three or four years this figure will reach the levy amount and then increase, he said.

Levels of contribution now differ, said Marchand, because each member negotiated individually when it joined.

Each city would also be required to provide and maintain its library building, paying for utilities and ground upkeep under the proposal.

Under the current contract the city of Bemidji pays building insurance and repairs and is reimbursed for operating expenses. The city would pick up all of the operating costs with the new agreement.

This fiscal year those costs, that included heat, electricity, and sewer and water services, totaled about \$5,600.

The information session begins at 8 p.m. Thursday in the library.

as some people think, according to superintendent Vernon Peterson. He reached this conclusion after looking at the results of a survey conducted by the League of Women Voters at the Beltrami County Fair.

There were 476 residents who responded to the survey, 398 rural and 187 from the city.

"Do you believe the present equipment and facilities are adequate for school programs?" was the first question; 56 percent of the rural and 56 percent of the city people said no.

"Projections for the Bemidji area indicate future population growth. Do you believe the present school buildings will then be adequate?" was the second question; 74 percent of the rural people and 79 percent of those from the city said no.

The third and last question read: "Much discussion has taken place about concerns relating to the Bemidji Public Schools. Which of the following do you think is - are the most important items to be given attention in District 11?"

Six items were then listed, and they were ranked by those surveyed in the following order of importance: More junior high space, new buildings, a middle school, transportation, building sites, and curriculum.

Respondents were also provided with space to give their own suggestions of concerns the district ought to be addressing. Some of those which came up often were: decreasing emphasis on sports and increasing emphasis on basics, the arts.

(Continued on page 21)

Cleanup underway at oil spill near Pinewood

By JODY GRAU
Staff Writer

Cleanup efforts at the site of Monday's crude oil spill just southeast of Pinewood continue, but apparently not always in accordance with state Pollution Control Agency standards.

Lakehead Pipeline Co. officials unnecessarily dumped about 100,000 gallons of oil onto the ground in direct opposition to a PCA recommendation, according to Willis Mattison, Detroit Lakes regional manager of the PCA.

Mattison said that about 100,000 gallons of oil had to be pumped out of the pipe to allow for the replacement of the split section and that he had recommended that the oil be pumped directly into tankers for transport. Instead it was pumped onto the ground, he said.

"The agency will have to decide what additional environmental aggravation this action may cause and then decide on what type of enforcement recourse should be followed," said Mattison.

He added that he fully expected some type of recourse to be taken and did not rule out the possibility of the matter ending up in court.

"It seems that getting the pipeline back in operation was their primary concern," Mattison said, adding that at one point Lakehead had 22 people working on replacing the pipeline and only two pumping oil.

Mattison said this morning that he now fears the ground water may be contaminated, which would render the water table in the area totally useless.

Soil boring operations were under way today and at 11 a.m. incomplete results showed that saturated oil is present down to 15 feet and that oil continues to be present down to at least the depth of 21 feet. Crew members said the soil is sand down to 21 feet and that they hit silty sand at that point and would continue to drill.

Mattison said oil residue breaks down very slowly under ground and that

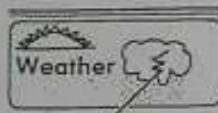


Cleanup underway

A bulldozer was being used today at the oil spill site near Pinewood to route oil covered marsh water into

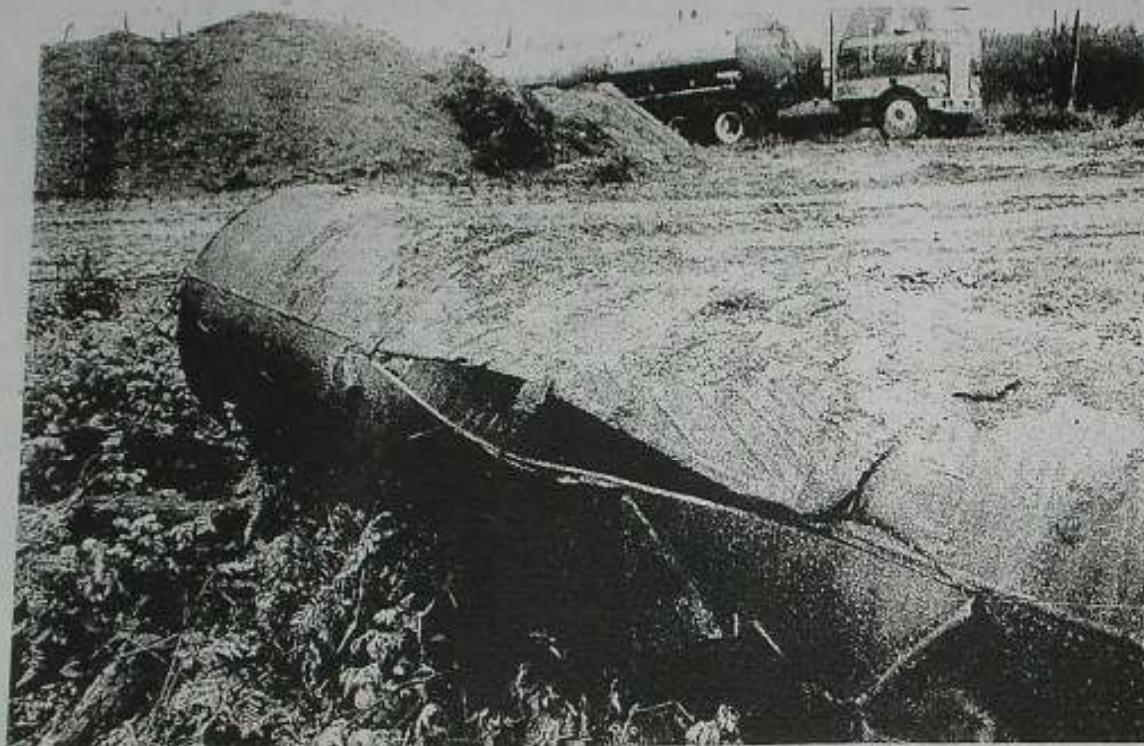
pools so that the oil can be pumped off the surface.

Photo by Jody Grau



Showers and thunderstorms ending this evening with partial clearing by late tonight. Low mild in upper 50s. Thursday partly sunny. High mild to upper 70s. Winds westerly under 10 mph tonight. Probability of measurable rain 30 percent tonight.

DRED INK



**250,000 gallon
break!!!**

Nearly a quarter of a million gallons of crude oil poured out of this split section of a Lakehead Pipeline Co. line near Pinewood Monday. Lakehead officials said the

pipe would undergo metallurgical testing to determine what caused the four-and-a-half foot rent in the 34-inch line.

Pioneer photo by Jim Almendinger

Oil clean-up to take months

PINEWOOD, Minn. (AP) — The cleanup of crude oil from a pipeline break north of Bemidji this week will take months, a Minnesota Pollution Control Agency official predicted Thursday.

The project is being complicated by the fact that some of the oil has seeped into the water table 15 feet below ground level.

As estimated 250,000 gallons of crude oil Monday poured from a ruptured 34-inch pipe carrying oil from Edmonton, Alberta, to Superior, Wis. The break occurred near Pinewood, about 30 miles northwest of Bemidji.

Lakehead officials have indicated that the total amount of oil lost in the spill may be as much as 250,000 gallons.

Richard Cable, head of the spills unit of the Minnesota Pollution Control Agency, said officials were trying to determine which direction the underground water was moving and were studying ways of removing the oil.

"The cleanup will take months, depending on what we have to do," Cable said. "And this could be something that would continue for years because we will be continuing monitoring the spill site."

Officials of Lakehead Pipeline Co. estimated that the cleanup work would cost the company at least \$150,000.

"We'll have to pay for cleaning up the oil, restoring the land as much as possible and possibly even reforesting the area," said Wes Cochrane, Lakehead vice president. "We'll do what has to be done, then add up the cost."

The pipe burst along a lateral weld and the pumps were automatically shut down by monitoring equipment that detected a pressure drop. A geyser of oil shot into the air when the pipe broke, covering five acres of vegetation and forming several large pools of oil. Tanker trucks hauled away considerable standing oil as repairs were completed on the broken line.

Cochrane said the section of pipe that broke would undergo metallurgical testing to determine why it failed. He said the oil in the pipeline at the time of the rupture was running at a pressure of 500 pounds per square inch, well below the maximum operating pressure of 638 pounds.

"We don't know what caused the break, but it wasn't pressure," the Lakehead official added.

John Aho, a MPCA geologist, went to the scene to determine what methods of containing and removing the oil would be most effective.

"The crews are working in a sandy, bog area, which makes removal of the oil more difficult," Cable said. "When we determine which way the water is moving, we can set up pumps downstream and try to remove it."

Trenches at least as deep as the water table probably will be dug around the perimeter of the spill to aid in recovery and to keep the oil from spreading, Cable said. He added that all of the contaminated soil may have to be removed.

WASHINGTON (AP) — The Energy and Agriculture departments say the Northern Tier pipeline proposal is the best way to bring Alaska crude oil from the West Coast to the Midwest. It is the only one of four proposed pipelines that would lie entirely in the United States.

The proposal by the Northern Tier Pipeline Co. was the only one to receive more than one recommendation from federal agencies asked to comment on the plan.

One proposal, that of the Kitimat Pipe Line Ltd., was not picked by any of the federal agencies involved.

Interior Secretary Cecil Andrus must recommend one of the proposals to President Carter by Oct. 15. Carter will make the final decision.

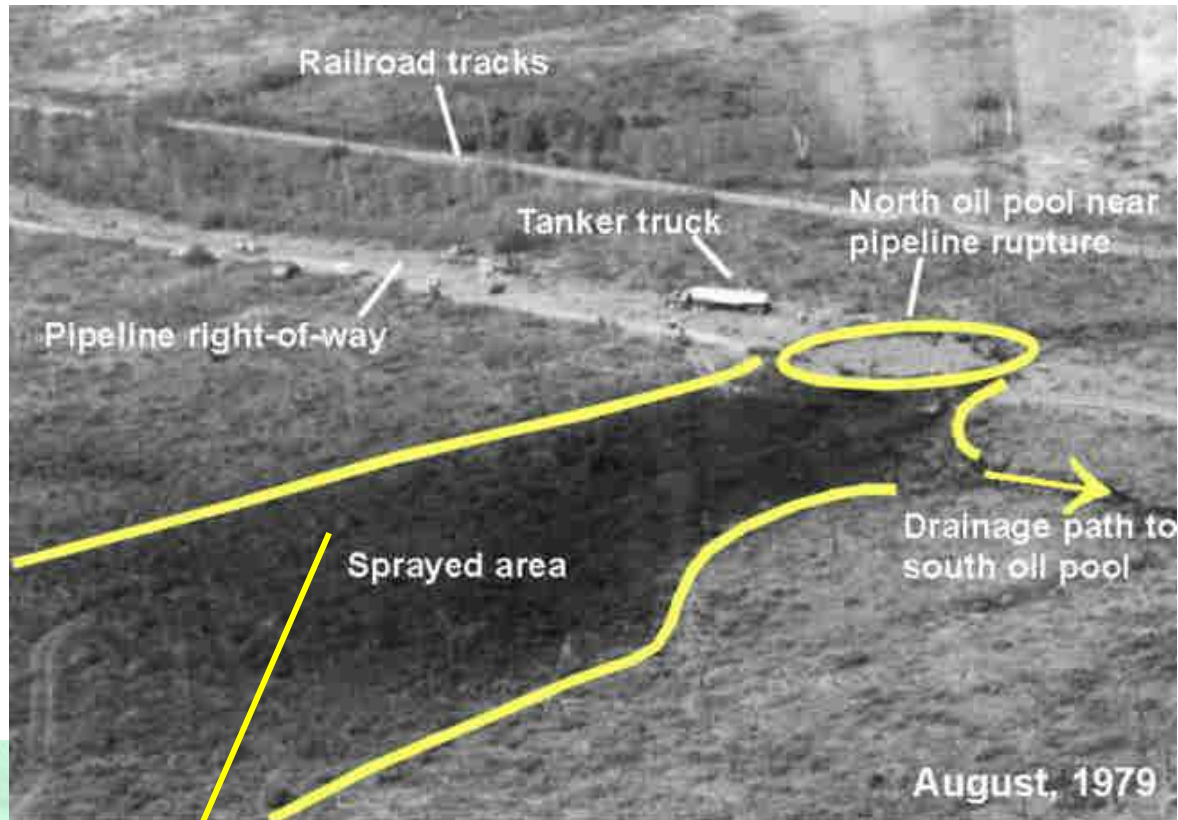
The proposals have sparked sharp disagreement among the federal agencies involved, according to their comments released Thursday by the Interior Department.

Northern Tier

The Pioneer

Serving the Minnesota North Country since 1896

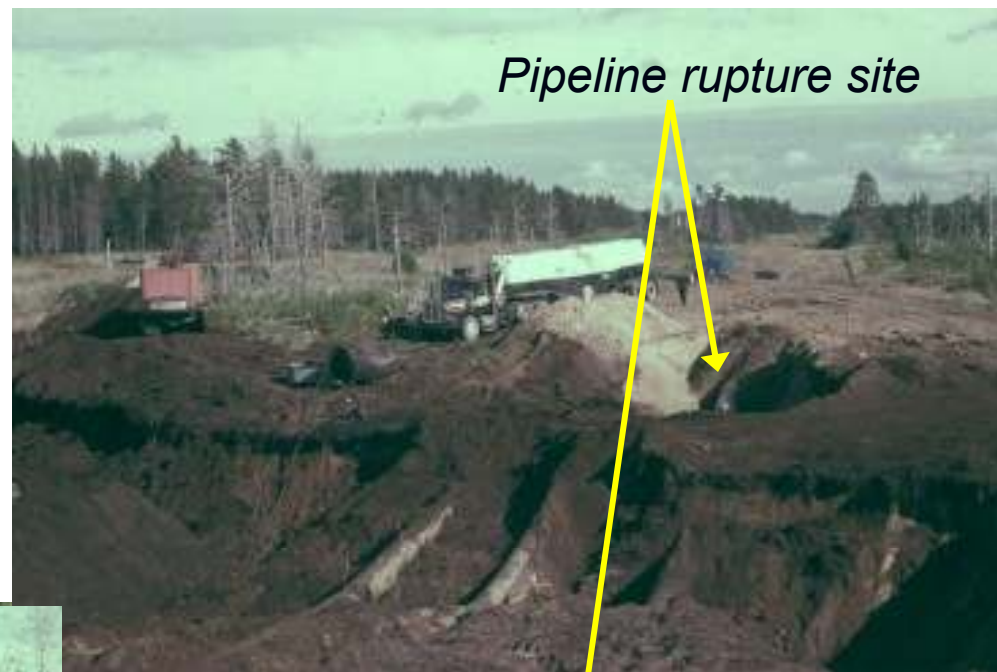
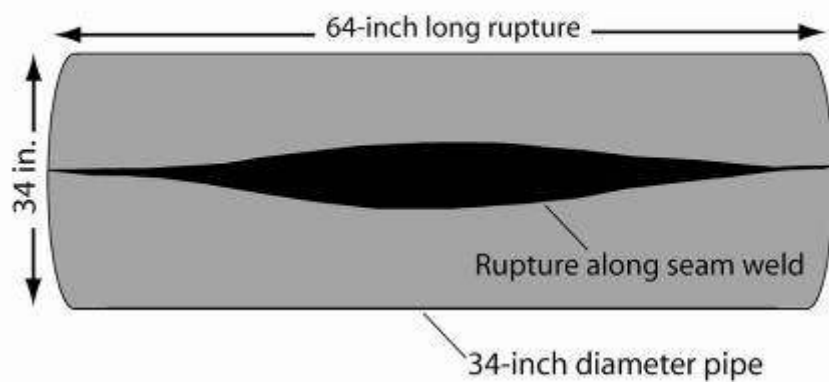
August, 1979



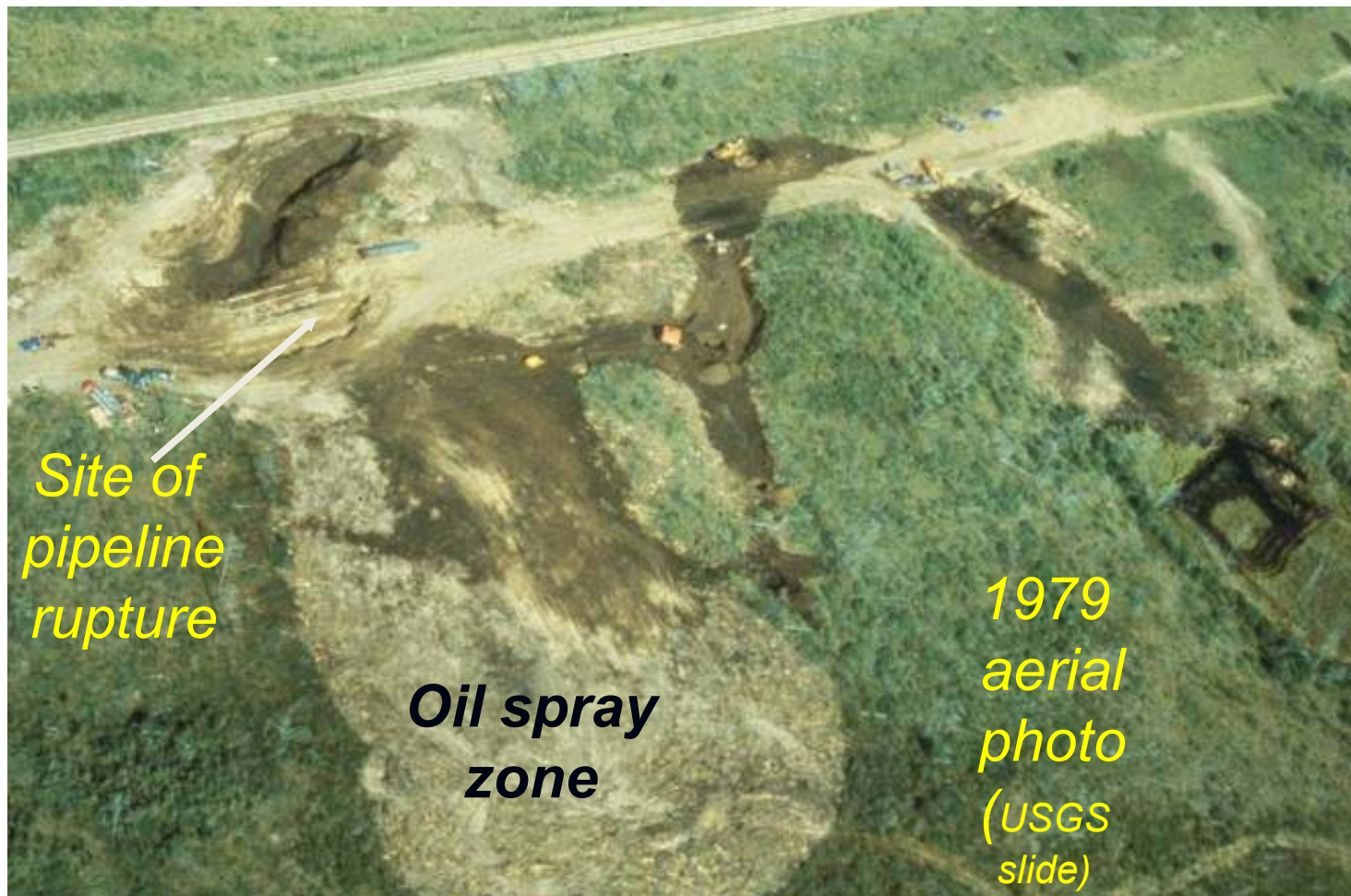
USGS slide, modified



SCHEMATIC DIAGRAM OF 34-INCH DIAMETER PIPELINE



Crude oil sprayed over large area



- Approximately 250,000 gallons lost
- Approximately 160,000 gallons recovered
- Pumping oil from ground and bog
- Excavations for disposal
- Land treatment
- Test wells, Dr. Olaf Pfannkuch
- Vegetation burns
- Hydrostatic testing of the line

- Normal response for that time- pump, burn, dig. Some degree of follow-up, but oil in subsurface left as unrecovered, or unrecoverable.
- Strategies have changed with time, with good and bad experience, and often with science. That's why we are here.

Researchers Take Advantage of a Natural Laboratory

Dr. Olaf Pfannkuch (U of Mn) and Dr. Marc Hult (USGS) began to research the site

Superfund and leaking tanks grabbed the MPCA's attention in the 1980's.

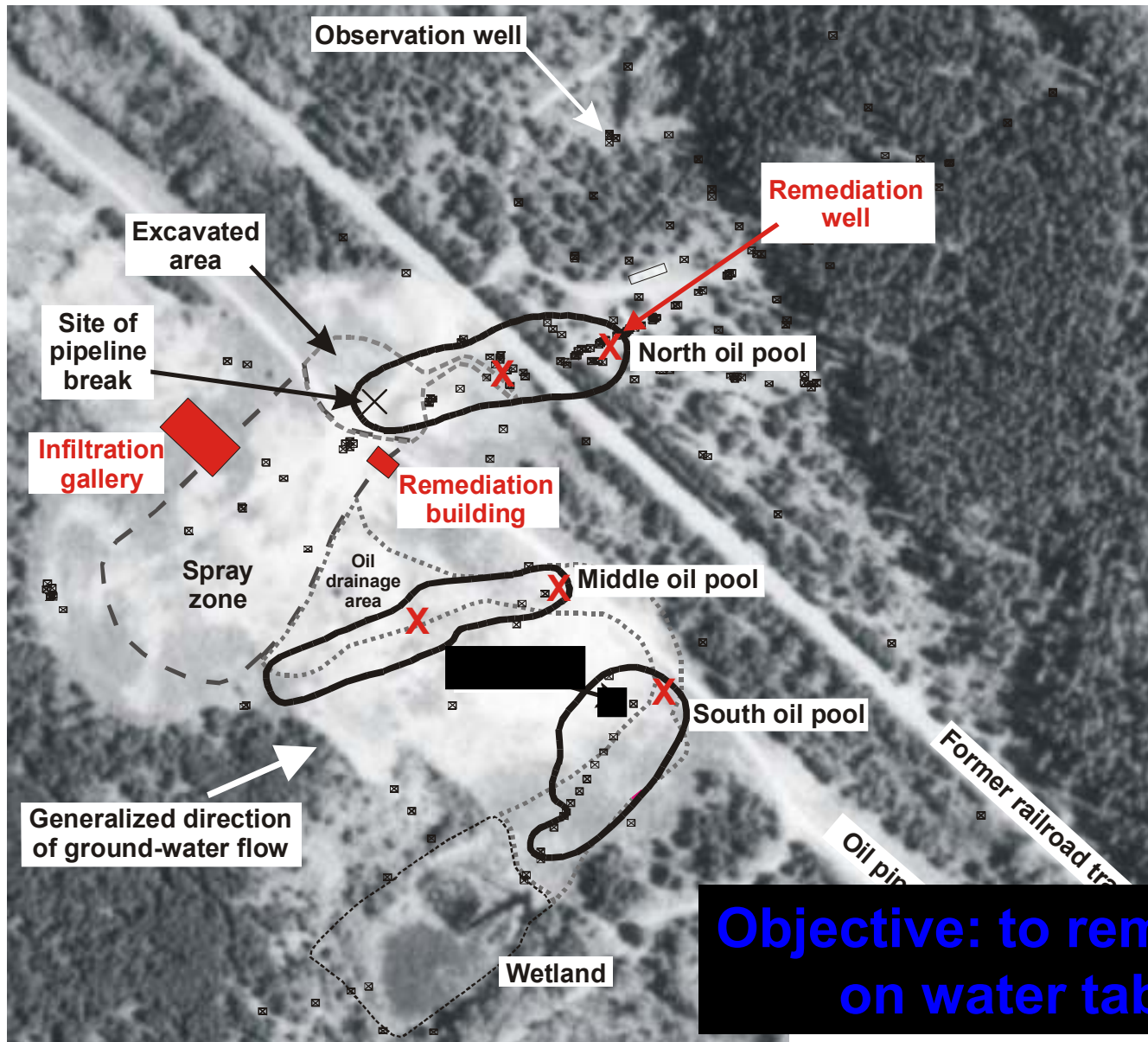
Petroleum pipeline spills and big petroleum terminals not picked up by those programs.
(we forgot about this one...)

Garfield Amoco “Ghost”

- An old pipeline break finds a well in 1991
- What other ghosts are lurking underground?
- MPCA went to the Pipelines and 104 big aboveground tank sites- let's cooperate on checking the old sites
- Sites that need a modern cleanup were separated from those where the risks are low

- Enbridge worked with MPCA on 2nd look and ranking of old sites
- Pinewood ID'd to need more work
- Pump/treat system established to remove oil but reached diminishing returns
- Company stepped back, developed proposal to dig

Renewed Remediation



Objective: to remove oil to a sheen on water table in the wells

Can we do something better than just dig it out?

- Alternative to “Dig it out, fill it in, seed it”?
- Excavation will destroy the research, with questionable net environmental benefit/risk reduction
- Enbridge, USGS, MPCA met- can we preserve research value while meeting environmental and business needs?

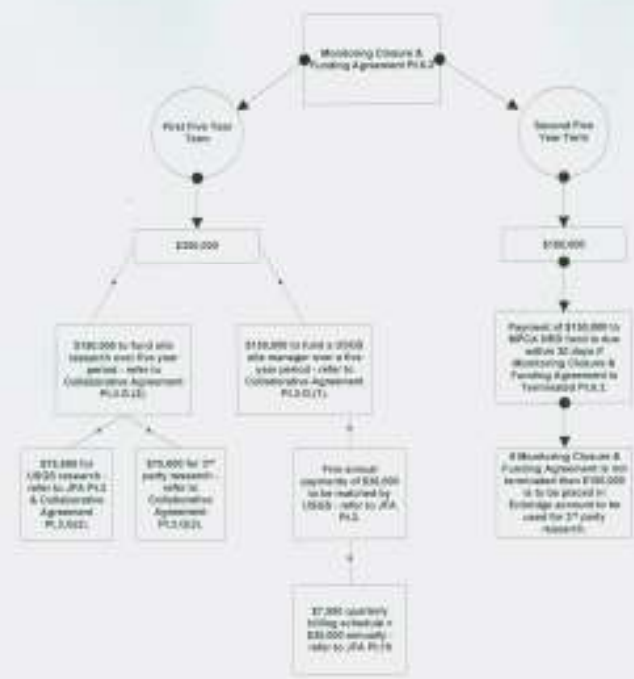
Group Goals

- Confirm that contamination is not going anywhere (environmental protection need);
- Assure that the research approach won't be reversed next year with a cleanup demand (Business need);
- Preserve the USGS research value;
- Include the County as landowner and accommodating partner.

Agreements to grow the science and to reap the science

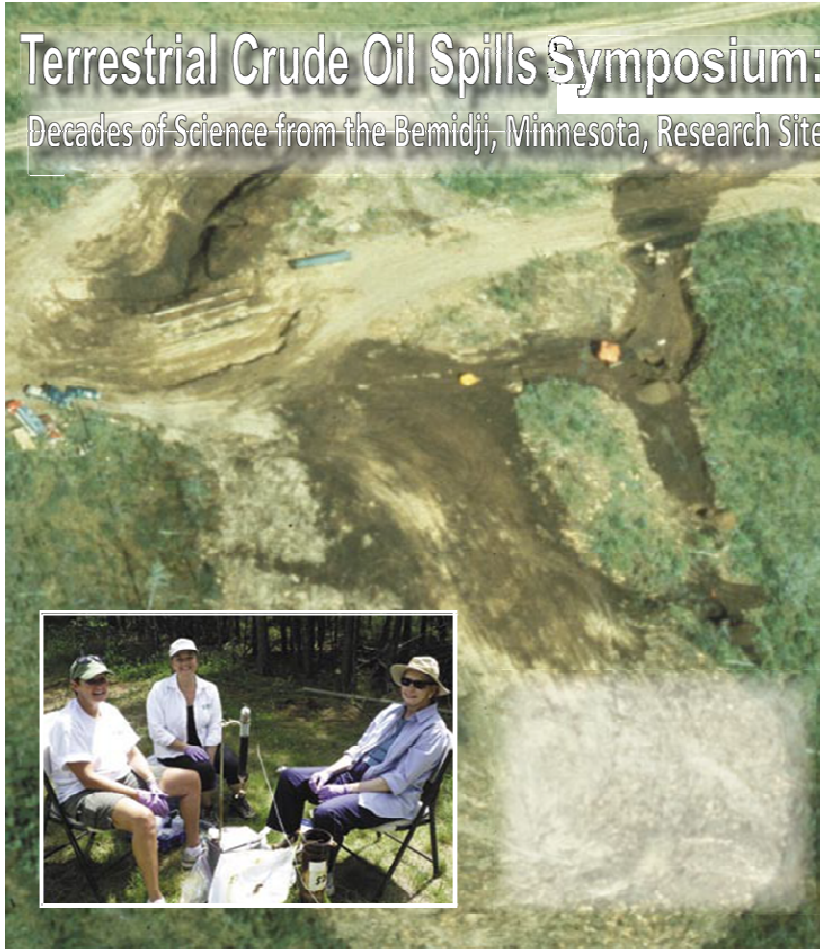
- Collaborative- 4 parties agree to cooperate
- Liability issues- residual contamination, response to any surprises, NRD settlement, ongoing safety
- Funding- Enbridge funding leveraging USGS and other funding for site management and research.
- Site manager, annual grants to researchers, annual symposium

Funding Sequence For "National Crude Oil Spill Fate and Natural Attenuation Research Site"



Terrestrial Crude Oil Spills Symposium:

Decades of Science from the Bemidji, Minnesota, Research Site



2012 Symposium Sessions

Welcome and opening remarks

How did the oil get into the ground, how did the national research site get off of the ground, and why is the science important?

Early USGS project design and research direction

Oil and contaminant transport research at the Bemidji, Minnesota crude oil spill site —historical perspectives

Evolution of the Bemidji north pool plume and oil over the last 30 years

What controls the rates of biodegradation in contaminant plumes?

Biodegradation in the vadose zone: What can we learn from measuring gases?

Temperature increases due to subsurface microbial activity

Bringing the lab into the field: using in situ approaches to measure biodegradation reactions

Is the north pool oil body stable or still spreading? – Testing a hypothesis

Using electrical geophysics to understand long term biodegradation of a mature oil spill

Spatial distribution of water repellency of soil at the Bemidji oil spill site; effects on vegetative growth and testing of a proposed remediation approach

Why does the science matter?

- Regulatory and cleanup programs must be based on science.
- To get the cleanup done right, the first time
- To minimize the damage done by cleanups
- Quicker, better, cheaper, surer

- Consultants, companies, regulators, contractors-
 - What are you hearing that you can apply?
 - What are your recalcitrant cleanup problems that could use some research?
- Researchers-
 - What is the state of remediation? Understand the recalcitrant problems
 - What gee-whiz thinking can be turned into fact in the field?

- <http://mn.water.usgs.gov/projects/bemidji/>