Focus on International Joint Commission Activities

Volume 9
Issue 4 *Focus on Great Lakes Water Quality (ISSN 0711-0855): vol.9 iss.4*

Article 1

1983

Focus on Great Lakes Water Quality (ISSN 0711-0855): vol.9 iss.4

UWindsor Administrator
University of Windsor, scholarship@uwindsor.ca

Volume 9 Issue 4
ISSN 0711-0855
1983: Winter?

FOCUS
On Great Lakes Water Quality

From Bonfires to Beacons

Lighthouses in the Great Lakes were built to keep ships carrying grain, timber, fur and minerals off the bottom of the lakes. Between 1878 and 1898, 6,000 Great Lakes ships wrecked. Ship owners who lost a lot of time and money lobbied the federal government to install more navigational aids. By 1925 there were 433 lighthouses, 10 lightships and 120 fog signals.

Most early Great Lakes lighthouses were built on the mainland or islands. They were small houses attached to a tapered tower holding a lamp encased in a huge magnifying lens. Later, to mark reefs or shoals, lights were housed on large concrete foundations in open water miles from shore.

Because they were navigational signals and landmarks, every detail of a lighthouse had significance to lake travellers. During the day, a Great Lakes navigator knew where he was by observing a lighthouse's color, size and shape. Some towers were painted white, red, or black, in patterns of stripes, bands or rectangles. The observant eyes of a mariner could detect the number of balconies near the top of the tower or distinguish whether the tower was cylindrical, hexagonal, or octagonal.

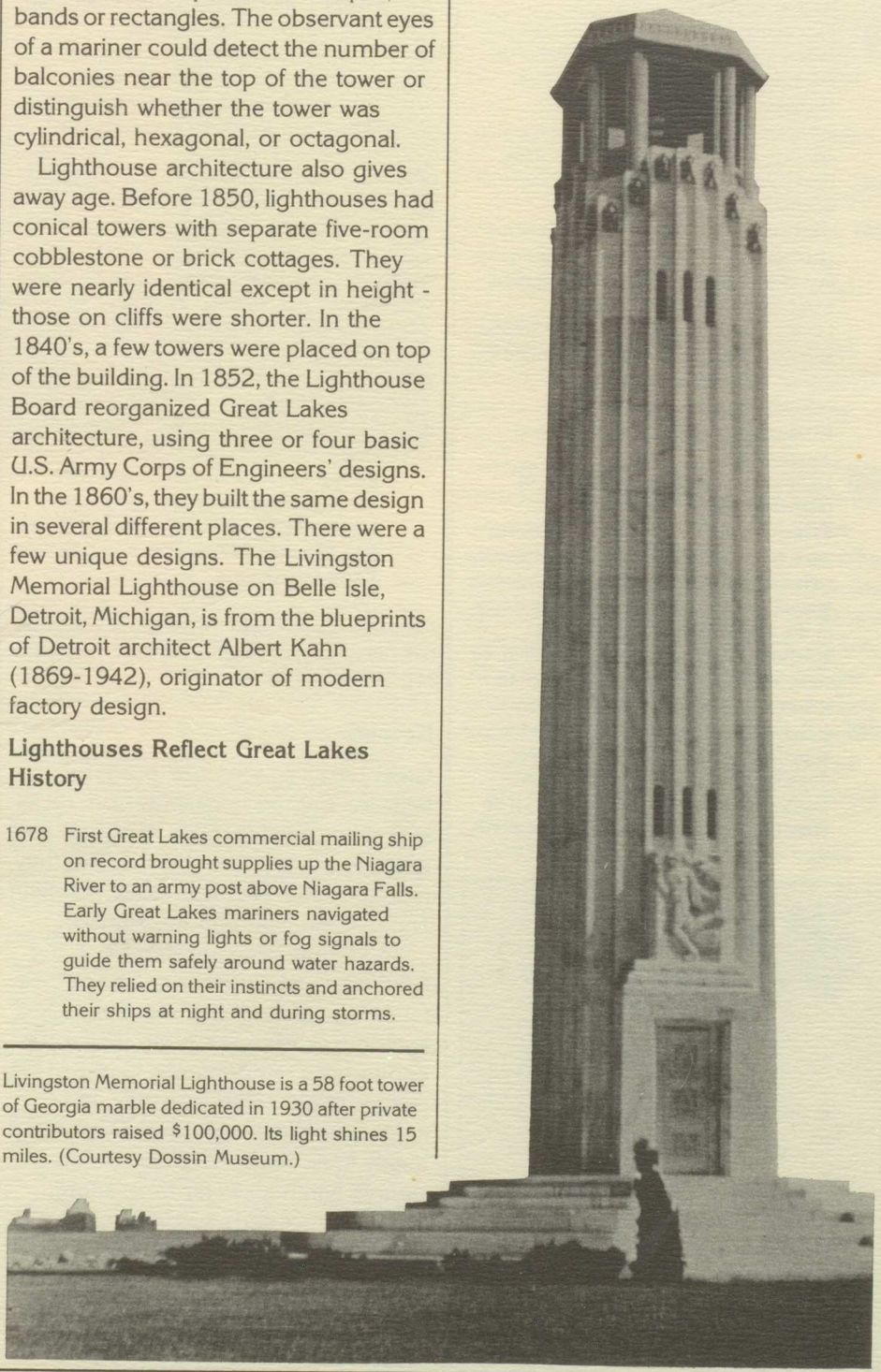
Lighthouse architecture also gives away age. Before 1850, lighthouses had conical towers with separate five-room cobblestone or brick cottages. They were nearly identical except in height - those on cliffs were shorter. In the 1840's, a few towers were placed on top of the building. In 1852, the Lighthouse Board reorganized Great Lakes architecture, using three or four basic U.S. Army Corps of Engineers' designs. In the 1860's, they built the same design in several different places. There were a few unique designs. The Livingston Memorial Lighthouse on Belle Isle, Detroit, Michigan, is from the blueprints of Detroit architect Albert Kahn (1869-1942), originator of modern factory design.

Lighthouses Reflect Great Lakes History

1678 First Great Lakes commercial mailing ship on record brought supplies up the Niagara River to an army post above Niagara Falls. Early Great Lakes mariners navigated without warning lights or fog signals to guide them safely around water hazards. They relied on their instincts and anchored their ships at night and during storms.

1804 Canada built the first lighthouse at the mouth of the Niagara River.

1818 First U.S. lighthouse on Lake Erie at Buffalo, New York.



Livingston Memorial Lighthouse is a 58 foot tower of Georgia marble dedicated in 1930 after private contributors raised $100,000. Its light shines 15 miles. (Courtesy Dossin Museum.)

Inside...

1820 First American lighthouse on Lake Ontario at Galloo Island.

1825 Lighthouse at Fort Gratiot, at the outlet of Lake Huron.

1829 First lighthouse on Lake Michigan at Racine, Wisconsin.

1837 First lightship (boat with a light stationed over a hazardous area) at the Straits of Mackinac between Lakes Huron and Michigan. For the next century, 12 lightships rode Great Lakes waters marking extreme dangers that could sink ships.

1847 First lighthouse on eastern Lake Superior at White Fish Point.

1851 Mechanical bells warned ships when fog obscured the beacon. These replaced the first Great Lakes lighthouse fog signals, hand-rung bells. South Manitou Lighthouse on the eastern Lake Michigan shore installed the first steam-operated fog signal. These were replaced by compressed-air fog horns run by combustion engines or motor-driven compressors.

1860 Lighthouses installed one to six-foot diameter, beehive-shaped, French Frensnel lenses. These focusing prisms were enclosed in a glass and brass dome, reflecting light in parallel rays. Lighthouse keepers could beam the concentrated light in the direction they wanted. Each lighthouse used a distinct signal pattern so mariners knew which light they saw to determine their ship's exact position.

1865 U.S. Lighthouse Service established to supervise seven lighthouses on Lake Ontario, 12 on Lake Erie, 10 on Lake Huron, 26 on Lake Michigan and 15 on Lake Superior. Lighthouse construction flourished through the 1930's as shipping trade increased.

1904 Lighthouses, except the most remote, switched to oil vapor lamps six years after they were introduced in France. Early beacon towers burned sperm whale oil, lard (animal fat) oil or mineral oil.

1918 Telephones, electricity and radio beacons modernized all but the most remote lighthouses. Radio waves controlled fog signals and automatic clocks operated electric range lights.

1938 U.S. Coast Guard absorbed the Lighthouse Service, assuming responsibility for navigation warning signals and mariner safety.

1960s The Coast Guard actively automated Great Lakes lighthouses so fewer required keepers to maintain them and operate light and fog signals.

1970s The last Great Lakes lightship was discontinued.

1983 The Sherwood Point, Wisconsin and Point Betsie, Michigan Lighthouses were closed - the last Great Lakes lighthouses with keepers. Sherwood Point Lighthouse keepers had guided ships through Green Bay, Sturgeon Bay and Lake Michigan Ship Canal for 100 years.

From: *Our Great Lakes,* University of Wisconsin Sea Grant College Program, Madison, Wisconsin, August 1984 (in press).

Keepers

Great Lakes lighthouses' powerful beacons warned ships away from rocky shorelines, islands, reefs or shoals and guided sailors to safe harbor. But they required lighthouse keepers to maintain and operate light and fog signals.

You might imagine what life in the lighthouse was like for keepers and their families and what today's vacant, locked lighthouses were like when they were comfortable family homes. Some of the picture might seem romantic, but lighthouse keepers and their families led lonely lives. Some keepers operated remote lighthouses far from shore. Supplies, mail and paychecks arrived by government lighthouse tenders whose schedules depended on good weather.

"Keeping" the lighthouse was not easy, especially in stormy weather. Tasks included trimming the wick, replenishing the oil, cleaning the lenses, turning the light by hand at different speeds or intervals to produce a distinct sequence of flashes, warming congealed lard oil during cold weather and diligently hauling it up flights of stairs.

During most of the time, keepers were confined to the light tower or the small rock around the lighthouse. Boredom could be a mortal enemy. Even though winter iced over the shipping lanes so lighthouse warnings were not needed, keepers were still isolated eight or nine months a year.

Keepers faced danger from storms, ice, fire and the constant threat of exploding oil lamps. In 1855 the schooner *OLGA* rammed the lighthouse on the north pier of the Sturgeon Bay ship canal. The ship's bow pierced the light tower, smashed glass and demolished the light. Fortunately, the keeper was not in the tower. (Source: *Our Great Lakes,* Don Davenport).

If you can imagine what life was like when lighthouses were tended by keepers, what do you imagine it would be like to live in a lighthouse today? A 64-year-old Chicago Harbor lighthouse is "home" for Sterling Bemis, a *Good Housekeeping* magazine advertising salesman. He has lived in the lighthouse more than three years, piloting his 21-foot Long Island clam boat up the locks of the Chicago River every day for work. He spent a year and a half convincing the Coast Guard to let him inhabit the vandal-plagued lighthouse, vacant since it was automated in 1978.

A Teaching Resource

Six years ago, the Charlevoix School District in Charlevoix, Michigan bought the Beaver Island Lighthouse with 65 acres and 2,200 feet of shoreline. Using federal grant money from the now defunct Comprehensive Employment and Training Act (CETA) and 50 students on summer vacation, the

International Joint Commission
United States and Canada
Great Lakes Regional Office

Editor: Patricia Bonner
Design & Layout: Yvan Gagné

For Additional Copies:
Write to Patricia Bonner, Editor, Focus on Great Lakes Water Quality, IJC Regional Office, 100 Ouellette Ave., Windsor, Ontario, Canada N9A 6T3.

Beaver Island Lighthouse. (Courtesy Charlevoix School System.)

district restored the lighthouse and several buildings. The lighthouse has three apartments and a full-time caretaker.

The site is used for environmental education and teacher in-service training and is shared with other school systems, 4-H groups and universities. Two hundred people attend Environmental Education Camp, lodged in platform tents. The camp also has two log cabins with a dining room and kitchen. Third graders spend a week on the island. Biology classes take field trips to observe unique animal and plant groupings that differ from mainland ecological systems. The state champion cross country track team trains there.

Contact Gordon Van Wieren, Superintendent of Schools, Charlevoix School District, 208 Clinton St., Charlevoix, Mich. 49720 (616) 547-3200 for more information on using the Beaver Island Lighthouse.

One Family's Lighthouse Museum

A visitor to Presque Isle Harbor, Michigan on Lake Huron in the mid-nineteenth century would have found docks, a sawmill, a store, barns and several shanties owned by lumbermen and fishermen. Beginning in 1838, materials were brought in by boat, and construction of a lighthouse was done by Jeramiah Moors of Detroit. The tower walls are four feet thick, and great blocks of stone are carved to form the circular stairway to the top. Very impressive engineering, even by our modern standards, went into the design of the building. The tower was officially lit in September of 1840. Thirty years later a taller lighthouse was built a mile north, and the light keeper moved into his new quarters. The Old Lighthouse was left neglected and abandoned until the early 1900's when S.J. Stebbins, along with his family, purchased the buildings and made a project of restoring the old cottage and lighthouse tower. Today, the family's antique collection provides an authentic glimpse of everyday life during those years of lighthouse service at Presque Isle in the Old Lighthouse and Museum which is open to the public for a small admission charge.

Historical Sites

The Ohio Department of Natural Resources is preserving the Marblehead Lighthouse as part of East Harbor State Park. The Marblehead beacon has been warning sailors since 1822. Located at the mouth of Sandusky Bay on Lake Erie, it is the oldest continuously operated lighthouse on the Great Lakes. (Great Lakes Historical Society)

The Coast Guard has applied with the National Register of Historic places to have all Great Lakes lighthouses registered, but many light piers and catwalks are in danger of being demolished unless communities act quickly to get them registered as historic places. In the 1870's, the U.S. Army Corps of Engineers developed pierheads in harbors to keep sand bars from forming. They had to put lights on the ends of the piers to guide ships around them and built elevated catwalks so the lighthouse keeper could reach the light during storms. Since the lights are controlled now from an electric switch on shore, the Coast Guard no longer wants to paint, clean and accept liability for the catwalks. Only two have been preserved by having them registered.

For information on how to go about getting your lighthouse registered, contact Mike Van Hoey, Great Lakes Lighthouse Keepers Association (GLLKA), P.O. Box 2907, Southfield, Michigan, 48037; U.S. Coast Guard, Office of Aids to Navigation, 9th Coast Guard District, 1240 East Ninth, Cleveland, Ohio, 44199, (216) 522-3950; or the historic preservation office of your state historical society.

According to the U.S. Coast Guard, 200 lighthouses are available for nonprofit organizations to lease. Mike Van Hoey at GLLKA has written for the list. (The Keepers Association sponsors regional annual lighthouse conferences from May through September. They show slides, have guest speakers from local museums or groups and arrange

with the U.S. Coast Guard to climb the towers. Write the Association for information about 1985 events.)

For More About Lighthouses:

- *Michigan Natural Resources Magazine* special lighthouse issues, January - February 1984 and July - August 1981, $2 each. Contact: Outdoor Store, P.O. Box 30034, Lansing, Michigan, 48909, (800) 248-5848.
- *Our Great Lakes,* Revised Edition, University of Wisconsin Sea Grant College Program, August 1984 (in press). Contact: Sea Grant Communications Office, 1800 University Avenue, Madison, Wisconsin, 53706 (608) 263-3259. First copy free, bulk orders at cost.
- "Lights of the Lakes" Michigan lighthouse poster. Contact: Coastal Management Program, Div. of Land Resources Programs, Michigan Department of Natural Resources, P.O. Box 30028, Lansing, Michigan, 48909.
- "Historically Famous Lighthouses," historical lore surrounding 56 famous American lighthouses, illustrated, 88 pages, 1972, $1.40. Contact: Superintendent of Documents, U.S. Government Printing Office, Washington, D.C., 20402. Order #5P1S/N 050-012-00097.2.
- *The Beacon* newsletter, lighthouse bibliography and information brochure. Contact: Great Lakes Lighthouse Keepers Association, P.O. Box 2907, Southfield, Michigan, 48037.
- Prof. Charles K. Hyde, Wayne State University Department of History, surveyed Great Lakes lighthouses for the U.S. Coast Guard in 1979. He has compiled his study in a comprehensive book that will be available in the fall for about $25. Contact: Russel McKee, *Michigan Natural Resources Magazine,* Box 30034, Lansing, Michigan, 48909, (517) 373-9267.

[Editor's Note: *Focus* gratefully acknowledges permission of *Lake Connection* to use the May, 1984 issue and the research work of Rhonda Lee, writer, as the basis for the Lighthouse items. *Lake Connection* is published for teachers by: Ellen Fisher, UW-Extension, Environmental Resources Center, 216 Agriculture Hall, 1450 Linden Drive, Madison, WI 53706. Please send letters or short articles to *Focus* about special lighthouses near you.]

CORRECTION: Bookshelf, page 4, column 3 in FOCUS 9-3 - York University's NIMBY Proceedings are $20 **plus** $2 postage and handling.

BRIEFS

Ontario's first mediation process to settle an environmental issue ended July 10, 1984 when 13 of 14 participants ratified continued operation of the Pauze Landfill site near Perkinsfield for up to three years. The Ministry of the Environment will give $380,000 toward provision of a communal water system for Perkinsfield residents. (MOE release)

****

The Metropolitan Toronto and Region Conservation Authority has a $99,000 grant from the Ministry of the Environment for water quality and pollution control studies in the upper Humber River watershed. Studies will be conducted to determine sources of bacteria, sediment and contaminants affecting water quality. Proposed work includes identifying and mapping areas of soil loss, point source discharge and other potential contaminated sources.

****

Ontario's Ministry of the Environment launched a $150,000 study of ozone emissions in the Sarnia/Lambton area. Results will be used in developing an ozone strategy for Ontario. Ozone, formed by photochemical reaction of nitrogen oxides and hydrocarbons, causes $15 million damage annually to Ontario vegetation including tomato, potato and white bean crops. (MOE release)

****

The Ministry of the Environment announced a three-part program to study means to reduce bacterial contamination in the Bay of Quinte. The program calls for:

- At Trenton, a source assessment study to identify and measure the significance of all major bacteriological sources.
- At Belleville, a water quality study to assess the effectiveness of the current sewage treatment plant expansion and a new diffuser outfall in reducing bacterial discharges.
- At Picton, a thorough study of the municipal sewage collection system to develop further measures to minimize overflows to combined sewers.

****

Reserve Mining Company of Silver Bay, Minnesota went to on-land disposal of its taconite tailings in 1980. (See Focus 5-3). Recently Reserve asked for and received a National Pollutant Discharge Elimination System Permit from the Minnesota Pollution Control Agency to resume discharge. Because the plant is operating at only 45 percent capacity, processing taconite ore into pellets used in steel making, less water is being recycled out of the tailings basin to its operation at Silver Bay. The basin is filling up much too fast and could overflow by January. Reserve wants to discharge 3,500 gallons of water a minute to the Beaver River, a Lake Superior tributary, from its tailings basin. A $2 million plant is to be constructed to remove potentially harmful asbestos-like fibers before they are discharged to the Beaver River.

****

In late July, 60 people met at Racine, Wisconsin in a conference called "Sustainable Redevelopment for the Future of the Great Lakes Region." They agreed there is a need for development of regional consciousness and made several recommendations:

- Defend Great Lakes water from external threats of diversion by establishing either a binational Great Lakes Authority or a binational political party to work within government on both sides of the border.
- Establish a binational, regional common market with a regional industrial policy.
- Set up a regional development fund, either through government or regional banks.

- Establish a Great Lakes ecosystem agreement to encompass water quality, water quantity, fish and wetlands.

- Forget trying to recapture the area's past, and build instead on the region's strengths, including the vast supply of water, good transportation access to markets, good educational institutions and farmland.

- Avoid habitat destruction by contamination, overfishing and other violations and work to rehabilitate destroyed areas in the lakes.

- Create a mandate for a long-term, integrated approach to resource management.

****

Seven major Hamilton-Wentworth environmental improvement programs will receive Ontario Ministry of the Environment support totalling $625,000.

The Upper Ottawa Street Landfill Site - $120,000 for site improvement work, including landscaping to control erosion and to minimize the infiltration of water through the site.

Greenhill Storm Water Control Facility - $100,000 towards a system to retain overflow from the collection system during severe storms.

Windermere Basin - $50,000 to study options for solving the aesthetics problems caused by sediment.

Van Wagner's Beach - $30,000 to track the sources of bacteria contamination which necessitated beach closures in 1983.

Sewage and Water Treatment Projects - $218,000 grant for a control system for the Woodward Avenue Water Treatment Plant; $71,000 for a new chlorination system at the Water Treatment Plant, and $36,000 for an extension into the outfall sewer at the Woodward Avenue Sewer Treatment Plant.

****

Ontario Ministry of the Environment made an initial grant of $283,749 in July to increase the treatment capacity of sewerage facilities of the Regional Municipality of Niagara. The funding was made available under a special agreement between Environment Canada and the Ontario Ministry of the Environment under the Special Recovery Capital Projects Program. The agreement is part of a cooperative federal and provincial government effort designed to accelerate selected capital projects in support of economic and regional development objectives for employment and industrial expansion. The Regional Municipality of Niagara is using the grant to expand the capacity of the Niagara Falls Water Pollution Control Plant to 68,100 cubic metres per day for a design population of 107,050 people. Total cost of the modifications is estimated at $12 million.

****

Ten years ago the Federal Environmental Assessment and Review Process (EARP) of Canada was created to help the Government understand the environmental implications of its proposed actions. This July it was strengthened and updated three ways:

1. An Order-in-Council, outlining the responsibilities of participants in EARP. The initial environmental screening and assessment of proposals of government departments will be done in a more systematic manner. Information about these activities provided by the departments concerned will be published regularly by the Federal Environmental Assessment Review Office (FEARO) which administers the process.

2. Better means of applying sophisticated scientific techniques are being developed to produce more effective environmental assessments. To this end, FEARO has been allocated $500,000 annually for joint programs with departments, industry, and other governments as recommended by the recently created Canadian Environmental Assessment Research Council (CEARC).

3. The Cabinet has asked that a paper be developed recommending a policy on intervenor funding government-wide, taking into account an evaluation of the pilot intervenor funding program in the just completed Beaufort Sea environmental review.

FEARO is working with major departments to produce a comprehensive screening and initial assessment guide and core procedures governing public reviews are being drafted, and is providing copies of the Order-in-Council and supporting information to encourage discussion on how to implement EARP improvements. (Minister, Environment Canada Release).

****

In June the Board of Directors of the Ontario Waste Management Corporation received reappointment for a further three-year term: Chairman, Dr. Donald A. Chant (Toronto), Vice-Chairman, V. Harvey Polk (Hamilton) and members, Firman Bentley (Sarnia), Edith Fuller (Haldimand), James King (Peterborough), R. Stephen Rodd (Guelph), Frank Sommer (Haldimand West), and new appointee Graham W.S. Scott (Toronto). The Hearing Panel on Industrial Waste Management was expanded: Chairman, Dennis M. Coolican (Ottawa), Vice Chairman and Hearing Officers Dr. O. Harold Warwick (London), A.H. "Bert" Weeks (Windsor), Dr. George M. Delgrasso (Sarnia), and Harry M. Smith (Ajax).

****

Late in May the Honourable Andrew S. Brandt, Ontario Minister of the Environment, made a statement to the legislature on "New Initiatives in Great Lakes Environmental Protection." He reported on the meeting of Great Lakes

Environmental Administrators from state, provincial and federal jurisdictions, the object of which was to develop a joint Great Lakes agenda to address the central issue of controlling toxic substances. In areas of direct interest to the Province of Ontario, the administrators resolved:

- To explore jointly among the Great Lakes jurisdictions the feasibility of a program to monitor the atmospheric deposition of Toxic Substances. Michigan agreed to convene a group of technical experts from each jurisdiction to examine the costs and technical aspects of the proposal.

-To request the International Joint Commission to step-up efforts to examine various approaches to the assessment of risks with Toxic Substances and the application of knowledge concerning risk tolerance activities.

-To promote alternatives to landfilling and encourage development of technologies for reducing, reusing, recycling and recovering waste with particular reference to hazardous wastes.

-In co-operation with IJC's Water Quality Board, to work towards a greater compatibility of fish monitoring data among the jurisdictions to ensure improved human health advisories and increased public knowledge.

****

A three-member commission has been established to conduct public hearings on Ontario Ministry of the Environment proposals for the regulation of mobile facilities for the destruction of PCBs or polychlorinated biphenyls. Members, Mary G. Munro of the City of Burlington, Chairman; Robert G. Eisen, Q.C. of the City of Toronto, and James W. Britnell of the City of Goderich, are on the Environmental Assessment Board. A $50,000 fund, which will be administered by the Hearing Commission, was established to assist parties participating in the inquiry.

****

Illinois, Indiana, Michigan and Wisconsin reached tentative agreement with USEPA to pool their personnel and data in an attempt to uniformly assess the potential health hazards posed by eating Lake Michigan fish. The agreement applies to monitoring trout and salmon for PCBs and other organochlorines, and sets up standard procedures for collecting and preparing samples for analysis. Contact David DeVault at 236 S. Dearborn Street, Chicago, Illinois 60604; (312) 353-1375.

Metropolitan Chicago's TARP

Water Management Strategy

by: Bill Macaitis, TARP Project Staff

[Editor's Note: At great cost and effort, the largest metropolitan area in the Great Lakes Basin is working to solve its combined sewer and associated problems, eliminating such discharge to the Great Lakes. The following article explores this comprehensive water management project. Vinton Bacon, now U.S. Chairman of the IJC's Great Lakes Science Advisory Board, headed the Chicago Sanitary District during much of the project period.]

Water resources management strategy in the metropolitan Chicago area revolves around one of the most ambitious pollution and flood control projects in the world. The Tunnel and Reservoir Plan in name and almost every other aspect - area, project features, construction time and cost - is large scale. Mercifully the project's acronym, TARP, is pronounceable, succinct, and generally used by the thousands employed in the project's implementation. Nonetheless, many of the Chicago area's residents know it only as the Deep Tunnel, an early but erroneous designation. To add to the confusion in its ongoing study, the U.S. Army Corps of Engineers calls the flood control elements of the project the Chicago Underflow Plan, and the Government Accounting Office (GAO) includes in its definition of the scope of the project over $3 billion worth of peripheral, independent capital improvements such as sewage treatment plant advanced treatment and channel widening for navigation.

The Metropolitan Sanitary District of Greater Chicago, the regional sponsor and implementing agency for the project, estimates the total capital cost of TARP to be $4.1 billion. It basically consists of 131 miles of deep tunnels, 10 to 35 feet in diameter, bored in the mostly limestone rock underlying the metropolitan area; three pumping stations with a total capacity of 2,700 million gallons per day (MGD) and three large surface reservoirs with 127,550 acre-feet of storage. (Picture a hole in the ground, one acre in area over 24 miles deep.)

For funding and implementation purposes, TARP has been divided into two phases. Phase I, the pollution control portion of TARP is being constructed by the Sanitary District. Over half of TARP Phase I, 47 miles of tunnels and the three pumping stations, costing $1.2 billion, is under construction or completed. In 1976, Congress shifted the responsibility for Phase II, the flood control element, to the Corps of Engineers. The Sanitary District estimates the cost of Phase I at $2.5 billion and Phase II at $1.6 billion.

The genesis of TARP lies in the area's water problems, a half century of water litigation and a number of Supreme Court decrees. The litigation centered around the diversion of Lake Michigan water to the Illinois River (Mississippi) system. The resultant Supreme Court decrees have effectively placed the

Chicago metropolitan area on water rationing.

The Metropolitan Sanitary District of Greater Chicago was created in 1889 to reverse the courses of the Chicago and Calumet river systems. These systems flowed into Lake Michigan at Chicago, carrying raw sewage from nearly a million people to the Lake. Waterborne disease epidemics were common; river reversals were to keep the Lake Michigan drinking water supply clean. By 1900, the flow of the Chicago River was reversed and litigation started. Upstream Great Lakes States claimed the diversion adversely affected the lakes levels and requested relief from the courts.

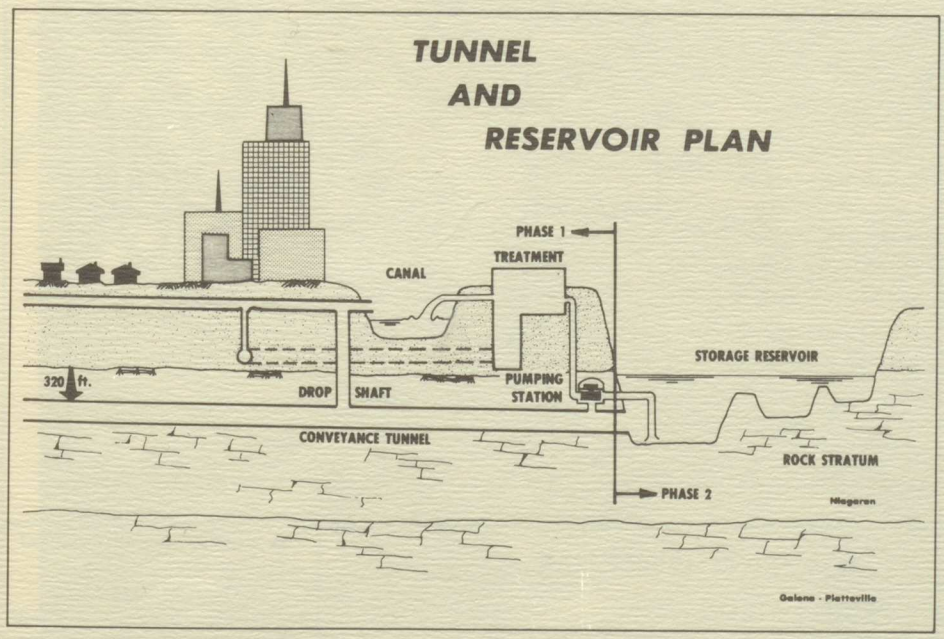
The Sanitary District's canal system was designed to dilute the area's sewage with the addition of a flow from Lake Michigan of 10,000 cubic feet per second (cfs). Supreme Court decrees and growing population have reduced the amount of available dilution water by almost 97 percent. Illinois is now limited to a total diversion for Lake Michigan and its tributary watershed of 3200 cfs. More than half of this total is used as water supply, and most of the remainder is uncontrollable stormwater. Primarily sewage treatment has accommodated environmental impact on the area's waterways. From 1900 to 1950 the Sanitary District built major treatment plants, including the world's largest secondary plant, the 1200 MGD West-Southwest Treatment Works.

Flooding has also plagued the Chicago area. The flat topography which allowed the reversal of the rivers, aggravates flooding problems. The sluggish, largely man-made drainage systems only reluctantly accommodate the increasing quantities of storm runoff brought on by urbanization so each year over 1.6 million people in the metropolitan area are flooded. [Editor's Note: Because a large portion of the metro Chicago area is served by combined storm and wastewater sewers, floodwater in canals, drains, rivers, basements and Lake Michigan can contain sewage.]

Since the construction of the first canal, the metropolitan area's population has increased over seven-fold to 7.1 million. Developing communities resorted to wells for water supply. Demand has resulted in the mining of the area's aquifers, increasing pumping costs and projected shortfalls of well water. Water levels in the deep sandstone aquifer, which is most heavily pumped, declined an average of 10 feet annually during the period 1966-1975. Only 106 of the 196 municipalities, utilities and other entities which have applied to the State for Lake Michigan water allocations are presently supplied with lake water, though within 30 miles of Lake Michigan, over one million people depend on wells for water.

Navigation must also be factored into Chicago's water management strategy. The stimulus for the settlement of Chicago in the 1840's was construction of the Illinois and Michigan Canal. Later, the reversal of the river systems gave, as a by-product, deep cut canals connecting the Great Lakes with the Illinois and Mississippi rivers. Four lock and dam facilities control the use of the Lake Michigan dilution water and when closed also serve to keep combined sewer overflow out of Lake Michigan except in the more severe floods. The levels of water within the waterway system are regulated by the Corps, and levels in the canals during rainstorms often adversely affect navigation.

TARP was developed specifically to solve the pollution and flood problems of the 375-square mile combined sewer area, but it is the key element of a comprehensive water management strategy for metropolitan Chicago. The combined sewer area is the most densely urbanized portion of the metropolitan area; it has a population of over 3 million people, and includes Chicago and 51 older suburban municipalities. Combined sewers carry both stormwater runoff and domestic and industrial sewage. It is characteristic that during dry weather periods only a small portion of the capacity of the sewer is used by sewage flows. Sewage generation is relatively constant during dry and wet weather. During wet weather, stormwater runoff generally takes the majority of the sewer's carrying



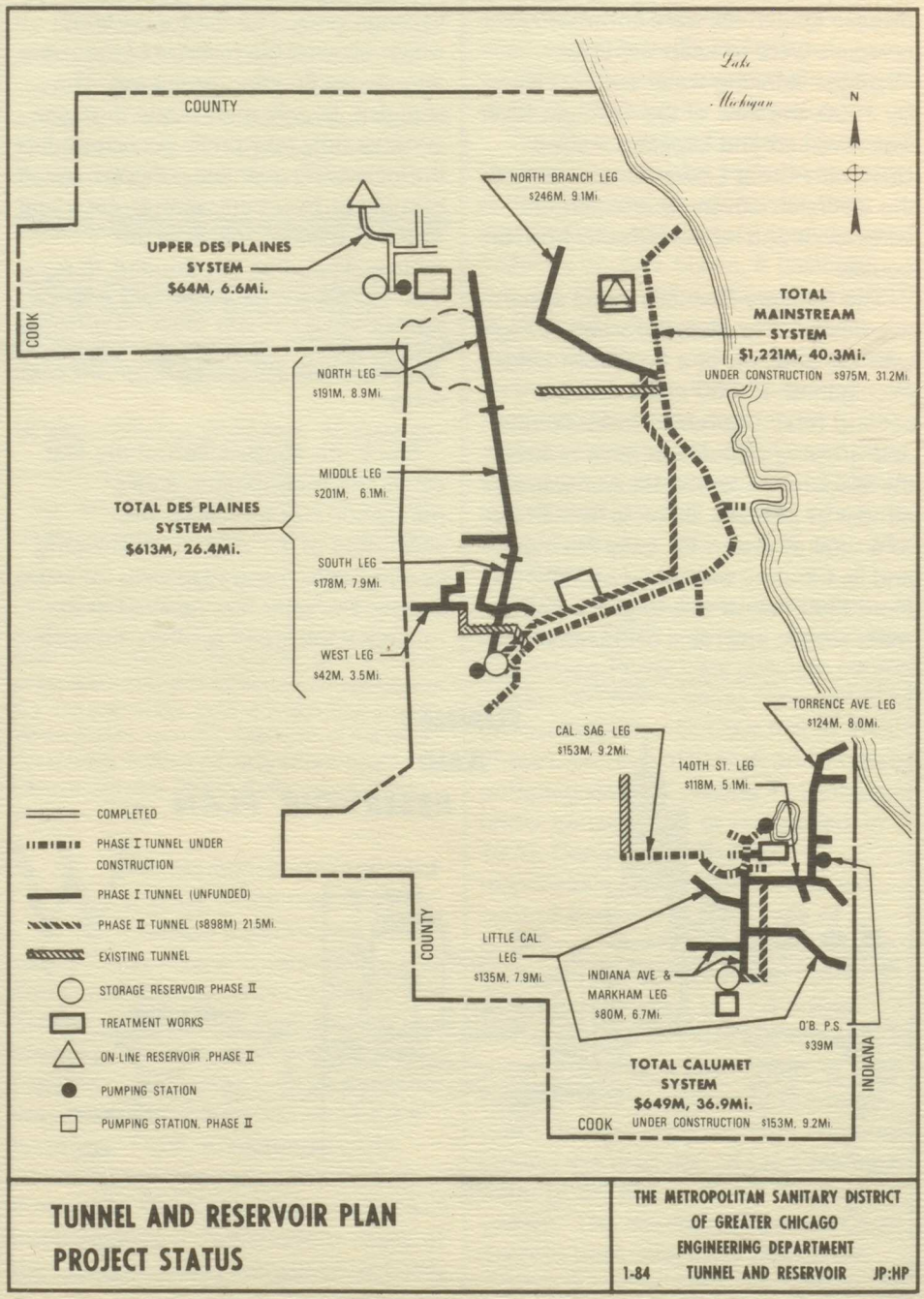
capacity and often overtaxes the sewer. The large volumes of combined stormwater runoff and sewage generated during a storm also overtax the Sanitary District's treatment capabilities. As a consequence, overflows of combined sewage enter the Chicago area's waterways at 645 overflow points on an average of once every four days. An average combined sewer overflow event has a raw sewage pollution loading of a day's waste discharge from 4 million people. This short-circuiting of the treatment system severely pollutes both the natural and man-made streams of the Chicago area and the downstream Illinois River system.

Significant rainfalls also cause flooding. For the last 30 years major storms have disrupted man's control of the area's hydrology causing the river systems to flow back to Lake Michigan on an average of about once a year. However, the frequency of backflows is increasing, and in 1981 a record number of five independent backflows occurred. Raw sewage mixed with storm and river water is flushed into the Lake at up to three points during backflow events. Area swimming beaches are closed and the prime water quality objective of keeping Lake Michigan and the area's drinking water supply clean is defeated.

In 1970, a Flood Control Coordinating Committee, having representatives from the State of Illinois, County of Cook, Metropolitan Sanitary District of Greater Chicago and City of Chicago began a multi-million dollar comprehensive study to establish a solution for the combined sewer area pollution and flooding problems. Three principal goals were established for the selection of a solution: prevent backflows into Lake Michigan; eliminate waterway pollution caused by combined sewer overflows; and provide an outlet for floodwaters.

These goals served as criteria to compare alternative solutions. Some previously proposed projects, such as increasing waterway channelization and conveyance capacity were eliminated quickly. The goal to clean up the inland waterways could not be achieved by channelization, as it would cause raw sewage and stormwater to be dumped more rapidly on a downstream Illinois River also plagued with pollution and flooding problems.

The "provide an outlet for floodwaters" goal evolved from an initial flood control goal through the Committee's technical analysis which



indicated that local sewer improvements (increases in carrying capacity) would be necessary for any flood control solution. The Sanitary District's intercepting sewer system acts as a wholesale collector of sewage from 52 municipalities' local sewer systems. Chicago's sewer system can now deliver 55,000 cfs of flow to a waterway that can only handle 10,000 cfs on a sustained basis.

After two years of study, TARP was selected as the most cost-effective solution meeting the goals of the region. Using mathematical models, the area's hydrology was simulated. Test tunnels were constructed using conventional drill and blast methods and newer boring techniques. Detailed preliminary engineering continues, expanding the subsurface exploration and refining the hydraulic criteria for the project.

TARP will intercept combined sewer overflows and transport these flows to large aerated holding reservoirs. During dry weather, when the waterways and treatment plants again have excess capacity, the reservoirs will be pumped out, and all of the combined sewage will be given complete treatment before discharge to the waterway. Effluent and stream pollution standards will be maintained, and flooding will be prevented. As the drainage is stored in the Chicago area until after the generating storm, the downstream Illinois River will benefit from reduced wet weather flows. Also, because of the storage, the Sanitary District's treatment plants need not be increased to the 2.5 times dry weather flow required by the U.S. EPA for plants serving a combined sewer area. The District's TARP dewatering treatment plants, which have existing excess dry weather capacity now, will only be expanded to 1.5 times dry weather flow.

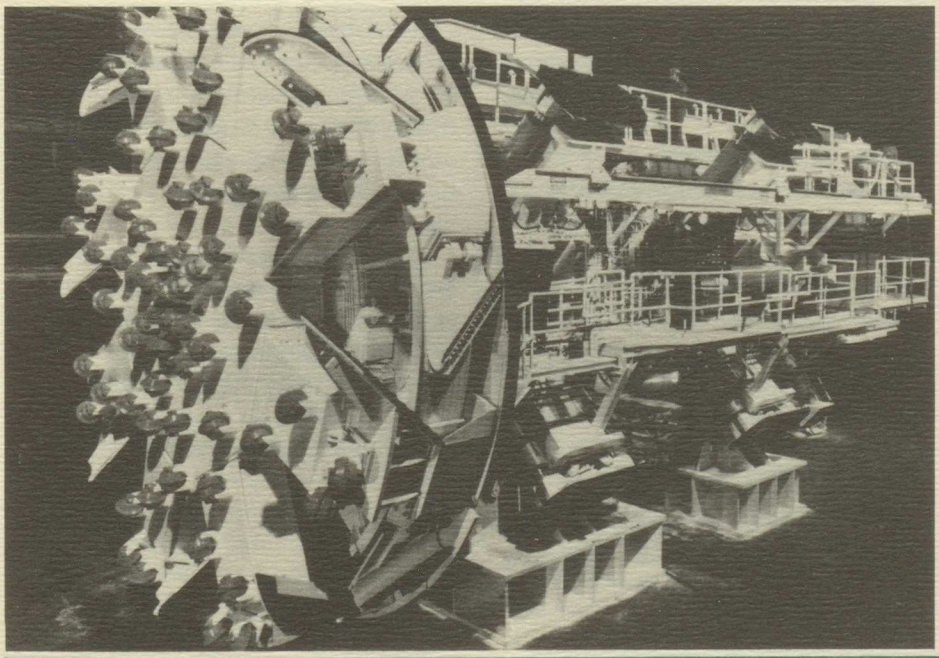
Upon completion of the Committee's report, the Sanitary District was selected to implement TARP. In 1975 U.S. EPA Clean Water Act grant funding was obtained for the project, but the project was divided into two phases. U.S. EPA regulations allowed the grant funding of only pollution control projects, and TARP constituted a multi-purpose pollution and flood control project. As the majority of the pollution control benefits (85 percent reduction in combined sewer overflow biochemical oxygen demand) were obtainable by the construction of most of the planned tunnels, 110 miles of tunnels and the pumping stations were designated as the pollution control, Phase I, element of TARP. The remaining 21 miles of tunnels and the planned reservoirs provided about 70 percent of the water damage related reductions, and were designated as Phase II. TARP Phase I is required to meet provisions of the Clean Water Act and Illinois' Water Pollution Rules and Regulations. The U.S. EPA is funding approximately 75 percent of Phase II to the Corps of Engineers. Construction was started on the first Phase I projects in 1975. Also in that year, design of the remaining Phase I projects was started.

In 1977, the State of Illinois made its first Lake Michigan water supply allocation pursuant to 1967 Supreme Court findings. The allocation determined that 320 cfs of direct lake diversion for water quality purposes or enough water for over 2 million people could be diverted to water supply usage when TARP came on line. This dilution water would no longer be necessary to maintain stream water quality standards once TARP removed the combined sewer overflow pollution load from the waterways. Additionally, the State found that diversion requirements for navigation could be cut from 95 to 30 cfs due to TARP.

TARP was reaffirmed by a six-county Northeastern Illinois Areawide Water Quality Plan in 1978. The intensive public participation effort associated with this plan resulted in over 200 public meetings. In addition, the Sanitary District held 19 public meetings focused on TARP and Phase I projects.

In 1979 the first U.S. Department of Agriculture, Soil Conservation Service (SCS) watershed plan for a basin adjacent to the TARP area was

TARP 30-foot diameter boring machine



completed. The Sanitary District was the major local funding sponsor for six SCS watershed studies started in 1972. These studies were aimed at overbank flooding in the separate sewer drainage basins peripheral to the TARP area. With TARP these watershed plans provide comprehensive flood control for a 1200 square mile metropolitan drainage area. The last of the watershed plans, the Lower Des Plaines Plan, will be completed in 1984. Five flood control projects have been constructed under the SCS watershed program at a cost of over $19 million. One reservoir is under construction ($5 million construction cost) and five other projects are in design.

By 1980, 47 miles of TARP Phase I tunnels and the three pumping stations with a contract award value of $1.2 billion were under construction. In May 1980 the first independent TARP system, 6.6 miles of tunnels located just north of the O'Hare Airport, was placed in operation. This system, in continuous operation since 1980, has met all of its design objectives. It is expected that all of the elements of TARP Phase I presently under construction will be operational by mid-1985. TARP projects have been scheduled for construction so that with the completion of the pumping stations, each tunnel project will become operational.

In 1983, the Corps released its first interim report on the flood control, Phase II, TARP project. The study focused on the O'Hare TARP subarea. It concluded that an $8 million reservoir providing storage for the runoff from a 10-year rainfall event was economically justified by federal National Economic Development (NED) Plan criteria. The Sanitary District's $1.6 billion price tag for all of TARP Phase II was predicated on a reservoir sized for a storm on the order of a 100-year frequency. The Corps is to complete its study of the remaining TARP areas in 1985.

Controversy concerning TARP has ebbed and flowed over almost two decades. Early controversy focused on which alternative solutions to the pollution and flood control problems would be chosen. Concern later shifted to cost and affordability. Phase I is affordable according to USEPA criteria. Considering that by population the Sanitary District's area would rank as the fourteenth largest state and the unique water resources constraints imposed on the area, the project's affordability can be more readily appreciated. Increases in the cost of TARP over the years have closely reflected inflation.

Recently, low technology alternatives have been claimed as more cost-effective. Generally, these alternatives do not meet the goals and requirements of TARP; they do less and cost less. Every proposed alternative has undergone detailed analysis by the District and others, and no more cost-effective alternative to TARP has yet been found.

TARP evolved from the water problems of the metropolitan Chicago area, and it presently plays a key role in solving those problems comprehensively. The protection of Lake Michigan, the upgrading of the inland waterways, flood control and an adequate water supply directly depend on the completion of TARP. With possible Corps of Engineers Phase II projects, the construction of TARP may extend into the twenty-first century. It has been termed the largest public works project in the United States.

About the Author

Mr. Bill Macaitis is the Assistant Chief Engineer, Collection Facilities Division, Engineering Department of the Metropolitan Sanitary District of Greater Chicago. The Division has planning, design and regulatory responsibilities as well as the responsibility for TARP, Phase I.

PBS will air "The Greatest Lakes", a half-hour documentary on Canada-U.S. cleanup, produced by WHA-Madison, October 1 at 10:30 PM EST, 9:30 CST. Call your local station for details.

LETTERS TO THE EDITOR

(and from)

Dear Readers

Since the forms for *Focus* continuation were mailed in May, response has been gratifying. Thank-you - so many of you - for personal notes on or with the returned forms. It is great to know that *Focus* is read and used.

Please write with your suggestions for making *Focus* better: send articles, topic ideas and possible authors, and items for use in regular columns. The editor's job is easier when the magazine "writes itself."

I guess the people who do not like *Focus* just did not respond because mail to IJC was tremendously encouraging. We received a 65% return. Again, thanks.

Sincerely,
Patricia Bonner
Editor

from James Fish, Executive Director, Great Lakes Commission, Ann Arbor, Michigan

I am enclosing a copy of our most recent Great Lakes Commission Commissioners and Advisors list for your reference. It is our hope that each of the individuals named on this listing could continue to receive *Focus*. We will provide you periodic updates of this list as significant changes come to our attention.

I also believe that it is important that the Great Lakes legislators continue to be informed on the activities of the IJC under the Water Quality Agreement. Since these individuals are the principal decision-makers in providing funding for the Great Lakes water quality clean-up activities (and could have increasing importance if current Administration proposals are enacted), it seems particularly critical that they have a constant flow of information relating to the quality of the lakes. It can

only assist state units of government who have management responsibility for Great Lakes waters and tributaries.

If you ever need assistance in contacting our Commissioners or Advisors on general or specific information items, do not hesitate to be in touch with the Commission staff. It is our mandate to provide our Commissioners with as much information from other agencies as we can secure in the area of Great Lakes water quality.

from Elissa Lichtenstein, Staff Director, American Bar Association, Washington, D.C.

...I very much enjoy receiving Focus and find the articles and brief notes very useful.

from Augusta Prince, Natural Resources Director, Ohio League of Women Voters

...I take this opportunity to say how much I enjoy reading Focus, as a resource for my LVW work for water quality...

from Dorothy Waldron, State President, Federated Garden Clubs of Minnesota

...The information is valuable to our organization and we really make use of it.

from Kenneth E. Shull, Consultant to Philadelphia Suburban Water Company

...It's such a fine publication, and I enjoy so much receiving it, that I'd hate to be dropped from the list.

from the Honourable Margaret Scrivener, Member of Provincial Parliament for St. David, Ontario

...I wish to continue receiving this fine publication,...

from Peter Wendel, President, Wendell Engineers, P.C. Lockport, New York

Focus...has many informative articles, and therefore is widely read in my company.

from Alan Kuper, Sierra Club, North East Ohio Chapter

...Focus 9-3 is a goldmine of environmental education references...

LAW AND THE COURTS

The United States EPA-Region V has

- Filed several administrative suits for hazardous waste violations under the Resource Conservation and Recovery Act:

- State Plating and Finishing of Grand Rapids, Michigan cited for failure to meet specific requirements dealing with preparation of contingency plans and personnel training.

- Michigan Waste Systems' Woodland Meadows Landfill (north of Wayne, Michigan) for violation of federal regulations for storage and disposal of hazardous waste, specifically requirements for monitoring groundwater.

- Environmental Waste Control, Inc. of Inkster, Michigan for violation of federal regulations relating to groundwater monitoring, specifically installing monitoring wells, preparation of sampling and analysis plan and a groundwater quality assessment program plan.

- Wyckoff Chemical Company of South Haven, Michigan for failure to meet specific requirements relating to financial assurance for closure and liability, the use and management of containers, and certain permit requirements.

(Each company is given 30 days to request a settlement conference.)

- Cited six Indiana drinking water supply systems for failing to meet Federal safe drinking water regulations; five for failing to sample for coliform bacteria and one for exceeding the standard for coliform bacteria. The towns with problem systems are: Bethany, Danville, Jeffersonville, Pence, Pendleton and Rensselaer. For details contact: EPA Region V, 230 S. Dearborn, Chicago 60604 - Joseph Harrison (312) 886-6206.

****

In May, U.S. EPA issued more stringent clean water standards for certain iron and steel making plants to settle separate lawsuits brought by environmental groups. Revised standards for oil refineries, coal mines and coal-preparation plants were issued earlier. (*Wall Street Journal,* May 10, 1984).

****

On June 6, U.S. EPA filed a civil suit against Republic Steel Corporation for air pollution violations at Warren and Youngstown, Ohio. The suit seeks to enforce terms of a court order Republic agreed to in March 1979 - to build a wastewater treatment plant by December 31, 1981 to treat wastewater (quenching water) from the two coke batteries. According to EPA, Republic owes the U.S. Government $7,500 for each day of noncompliance since December 31, 1981.

****

U.S. EPA - Region V announced June 19, that the Agency and Johns-Manville Sales Corp. have entered into an administrative consent order under which the corporation will conduct an investigation at its Waukegan, Illinois facility to determine the extent and impact of environmental contamination which may have resulted from past on-site disposal practices.
Johns-Manville has been disposing of asbestos wastes and other hazardous waste on its Waukegan facility since 1923.

The company will also propose to the Agency a cleanup plan to rectify any environmental problems resulting from its disposal practices that may be identified by the corporation's site investigation. Additionally, the corporation has agreed to pay the Federal Government $43,735 as reimbursement for investigative costs incurred by the U.S. EPA on this matter since August 26, 1982. The reimbursement is to be made to the

Federal Government's Hazardous Substance Response Trust Fund.

****

In August, Michigan became the first state to receive dredge and fill regulatory authority from U.S. EPA under the Clean Water Act Section 404 Permit Program. With the approval the State of Michigan becomes the issuing authority for all dredge and fill projects affecting most State waterways, including wetlands (except navigable waterways and those waters which could reasonably become navigable).

Science Board in Montreal

The Great Lakes Science Advisory Board held its 54th meeting in Montreal. Following its new format of public interactions and site tours, the Board saw the Montreal Sewage Treatment Plant in construction and visited the huge docking and material storage areas of the Port of Montreal.

The group was honored with a reception from His Worship Jean Drapeau, Mayor of Montreal and had the opportunity to meet Adrien Ouellette, Quebec's Minister of Environment, and several members of his staff during a reception and dinner.

Montreal City Hall.

(Photos - P. Bonner)

During the meeting the Science Advisory Board heard of management and development conflicts re: Lac St. Pierre. Following the tours and meetings, the Board held a news conference and locally distributed a news release.

Mr. Pierre Legault showing features of the Port of Montreal to Board members.

Board members on tour at the Montreal treatment plant.

The Board, its guests and Deputy Mayor Jocelyne Menard (second from left front row) at the Mayor's reception. (Photo courtesy Ville de Montreal)

Adrien Ouellette and Commissioners J. Blair Seaborn and Charles Bedard.

Board Chairman Dr. Richard Thomas signing a guestbook with Deputy Mayor.

EVENTS

Nonpoint Pollution Abatement - Technical, Managerial and Institutional Problems and Solutions will be held April 23-25, 1985 at the Hyatt Regency Hotel in Milwaukee, Wisconsin. Abstracts of 250-500 words are being sought. Call (414) 224-3524 (Vladimir Novotny at Marquette University) or (608) 266-1956 (John Konrad), Wisconsin Department of Natural Resources) for information.

****

The second Great Lakes Bioregional Congress will be held at Mystic Lake Camp, Clare County, Michigan, October 13-14. For information write or call Phil Theil, Route 1, 586 Kasson Road, Maple City, Michigan 49664, (616) 228-6494.

****

The Federal and Provincial Governments of Canada will sponsor an International Symposium on Acidic Precipitation as Muskoka Conference '85. It will be held at Clevelands House/Paignton House, Lake Rosseau in Muskoka, Ontario, September 15-20, 1985.

The Symposium will be devoted to aspects of the long range transport of airborne pollutants (LRTAP) and associated interactions and responses of the ecosystem. The focus is to be on acidification and the interactions with trace elements that result in ecosystem impairment.

The Symposium will include comprehensive plenary sessions, specific topic symposia and poster sessions. The specific topic symposia are expected to include: Deposition of Acidic Materials; Source/Receptor Relationships; Historical Perspective of Acidification; Chemical Transformation in Terrestrial and Aquatic Systems; Aquatic Regime Responses to Acidification; Forest and Crop Responses to Acidification; Weathering and Soil Chemistry Reactions; Mitigation and Reversibility of Acidification Effects; and Socio-Economic Assessment of LRTAP Concerns.

Express interest in participating by requesting information or submitting a title that would contribute to one of the listed topics or related areas of Acid Precipitation concerns to the Symposium Program Committee, Muskoka Conference '85, 112 St. Clair Ave. West, Suite 303, Toronto, Ontario Canada M4V 2Y3, (416) 961-6505.

****

The National Association for Environmental Education will be holding its annual conference in Banff, Alberta, October 5-9. The title for the conference is "International Perspectives on Environmental Education: Issues and Action". The subthemes to be considered are: Issues of Global Futures; World Campaign for the Biosphere; Environmental Education Planning; World Conservation Strategy and Environmental Education, and The Built Environment. For information on registration and reduced travel costs, contact NAEE, Box 400, Troy, Ohio, 45373.

****

The Lake Michigan Maritime Museum held its first Great Lakes Maritime Preservation Conference September 11-12. Co-sponsored by the Ontario Heritage Foundation, the two-day program was to be a forum for the exchange of ideas and knowledge leading to a network of cooperation among Great Lakes maritime preservation organizations. For information on the conference results write: Lake Michigan Maritime Museum at P.O. Box 534, South Haven, Michigan 49090.

****

The 1984 Michigan Society of Planning Officials Annual Conference is jointly sponsored by Ontario local officials and offers sessions on comparative planning/zoning and economic development in Ontario and Michigan as well as sessions on the "Wise Use of Our Freshwater Resources", the theme of the conference. The conference will be held October 11-13 at Sault Ste. Marie, with sessions on both sides of the river. For more information or a *free* preliminary conference program, write MSPO, P.O. Box 18187, Lansing, Michigan 48901; or call (517) 484-3333.

BOOKSHELF

Lake Huron Guide is a pocket-sized paperback available from Michigan Sea Grant (4107 IST Building, 2200 Bonisteel Blvd., Ann Arbor, Michigan, 48109). It describes both weather and recreational opportunities for all four seasons.

****

Wildlife in Jeopardy, a new, very detailed teaching kit produced by the Federation of Ontario Naturalists, is concerned with Ontario's endangered and threatened plants and animals and their habitats. The 283-page kit has five teaching units in booklet form. The units are Wildlife in Jeopardy; What is a Community?; Communities in Jeopardy; What is Being Done? and What Can You Do?. Each illustrated unit has detailed lesson plans and topics for discussion. The greater bulk of the material will be used in grades 7 and 8, but the inclusion of games, projects, quizzes, crossword puzzles, and experiments means that there is something for all ages, as well as for group or individual activities. This versatile approach allows teachers to use the kit in a formal classroom or small-group situation. All subjects that complement The Formative Years and the Intermediate Science Curriculum -

the curriculum guidelines of the Ontario Ministry of Education - are identified. Order *Wildlife In Jeopardy: Ontario's Endangered and Threatened Species,* Teaching Units 1-5 and Resource Unit (20 Colour Slides, 25 Species Fact Sheets, 65 Community Fact Sheets, Wildlife Reader, short stories, list of 16mm films, 19 Booklets and Brochures), from Federation of Ontario Naturalists (355 Lesmill Rd., Don Mills, Ont. M3B 2W8) for $45.00 Canadian. (From a review by Don Baldwin for *Education 84* edited by Diane Turbide)

****

Water Quantity Resources of Ontario, is a 72-page book released by the Ontario Ministry of Natural Resources. With numerous color maps and diagrams, it examines the supply of surface and groundwater in the province, as well as the many uses of water across Ontario. The book is available from the Ontario government bookstore at 880 Bay Street, Toronto. Telephone: (416) 965-2054, or send a cheque or money order, payable to the Treasurer of Ontario, for $24.95 (Canadian) to: Publications Centre, 880 Bay Street, 5th Floor, Toronto, Ontario, M7A 1N8 (two weeks delivery). For more information: Rob Milligan, Lands and Waters, Toronto, (416) 965-6281.

****

Atmospheric Deposition, edited by Edward R. Frederick, was published in 1983 by the Air Pollution Control Association, P.O. Box 2861, Pittsburgh, PA 15230, (412) 621-1090. The 476-page volume contains proceedings of a specialty conference held in Detroit, Michigan in November, 1982.

****

Managing Wastes: A Guide to Citizens' Involvement, by Phil Weller and John Jackson, is a 39-page booklet that tells you what to do, who to talk to and where to go. Based on interviews with groups in Ontario that have worked on waste management issues, the booklet describes the successes that groups have had and how they have done it. Copies are available at $1.80 (Canadian) from the authors at 25 Glen Road, Kitchener, Ontario N2M 3E7; (519) 744-7503.

Delta College's Nature Center

It is no secret that over the past several years the economy of the State of Michigan has been anything but robust. Programs in natural resources and state parks have been especially hard hit. One victim was Jennison Trailside Nature Center near Bay City, Michigan. The nature center served as the focal point for tours and interpretive programs in the nearby 1700-acre Tobico Marsh.

The Jennison Nature Center closed from 1979 until the summer of 1984 when a unique arrangement was proposed turning over the operation of it to Delta College. Delta invited Saginaw Valley State College to share in plans for reopening and developing the educational potential of the nature center and adjacent Tobico Marsh. This proposal was later approved by the Michigan Department of Natural Resources.

What makes this particular arrangement so different is the size and uniqueness of the Tobico Marsh. The 1700 acre refuge includes an 800 acre marsh on the shore of Saginaw Bay. While the wetlands surrounding the Saginaw Bay have historically provided a major stopover for migrating waterfowl, most of these wetlands have been lost over the years to draining and development. Tobico Marsh is one of the largest remaining refuges along the entire shore of Saginaw Bay. In addition to a large local population of waterfowl, the marsh is filled with thousands of ducks, geese and swans during the autumn and spring migrations. Song birds and shore birds are also abundant both in number and species. An extensive five-mile trail network borders the marsh and traverses mature stands of beech, maple and oak. Two 30-foot observation towers provide the visitor a true bird's-eye view of the marsh.

In addition, there is a 300-foot boardwalk extending into the marsh, and there are several foot bridges through the wetlands. The value of the Tobico Marsh was recognized in 1976 when it was added to the select list of National Landmarks by the Department of the Interior and the National Park Service.

The Jennison Trailside Nature Center, a short walk away from the entrance of Tobico, allows the visitor the opportunity to learn about the area before beginning a tour. The Center includes many dioramas depicting life in the marsh as well as hands-on displays and exhibits. There are numerous

mounts of birds and mammals native to the wetland environment as well as aquariums with fish from the marsh. Directly behind the museum is a paved trail for handicapped visitors and a glassed-in viewing area where visitors can observe many different species of birds at the feeding stations year round. The class/conference room in the Center has a large stone fireplace and can accommodate fifty.

Immediate plans for the Center and the Tobico Marsh are to provide interpretive programs and tours to the public and a special learning environment for classes from the two colleges. This summer, programs for the public have ranged from pre-schoolers to senior citizens and have involved several thousand. To date over 7,000 visitors have toured the Center.

Biology classes currently use the property and future plans include year-round classes in disciplines such as photography, history, resource economics, botany, geology, and english. Guest speakers are also planned as are special college programs. An Explorer Scout Post has been established at the Center as has a chapter of the National Audubon Society.

Soon there will be a community membership drive for the Center and development of a volunteer program to assist in the operation of the facility. Student internships for credit are being established and new programs developed leading to degrees in conservation and environmental education. The colleges are working closely with community development organizations to promote the facility on a Great Lakes basis. Students in marketing and economics will become involved in these programs to gain direct experience. Currently area artists are printing murals in the interpretive center on every aspect of the marsh. The theme of the center will ultimately be based upon these murals and the need to preserve our Great Lakes wetlands.

For additional information contact: Dr. Bradley Smith, Director, Jennison Nature Center, Delta College, University Center, Michigan 48710, (517) 686-9259.

Photos courtesy of Jennison Nature Center.

THINGS TO SEE

Three audiovisual materials covering chemical industry waste disposal and health and safety activities are being given away free to educators by the Chemical Manufacturers Association (CMA). "The Need to Know" is CMA's 16mm 12-1/2 minute film explaining hazardous waste disposal and covering chemical industry practices. "Doing Something" portrays on-the-job activities of health and safety specialists. It covers product safety, worker safety, transportation safety and pollution control. It is available in three-quarter inch videotape format. "Meeting the Challenge of Change" is an 18-minute three-quarter inch videotape presentation that tells what the chemical industry is doing to minimize the risks and maximize the benefits of chemicals through research and initiative. The Chemical Balance is a 12-minute slide show on the same topics. Single copies are available free to educators as long as limited supplies last. Write, on school stationery, to Richard Wildson, Chemical Manufacturers Association, 2501 M Street, N.W., Washington, D.C. 20037. (*Environmental Spectrum*, April 1984).

****

The National Film Board has recently published a brief catalogue entitled Films for Science and Environmental Studies. Listed are 98 films produced by the Film board and CBC's Nature of Things. The general categories under which the films are listed are: Astronomy, Biology, Careers, Ecology, Physics and Meteorology. Copies are available from the NFB, P.O. Box 6100, Montreal, Quebec H3C 3H5.

****

Jim Buckels, a popular midwestern artist whose landscapes are reminiscent of Grant Wood, was commissioned by the Soil Conservation Society of

FOCUS
On Great Lakes Water Quality
P. O. Box 32869
Detroit, Michigan
48232

THIRD-CLASS BULK RATE
POSTAGE & FEES PAID
INT'L JT. COMM.
PERMIT NO. G-122

America to create original art to commemorate the 50th anniversary of the soil conservation movement in the United States. The art is available from SCSA in two forms, a poster print for $12.00 and a signed and numbered limited edition print on gallery-quality paper for $75.00. Write SCSA, 7515 N.E. Ankeny Road, Ankeny, Iowa 50021-9764. (Photo)

****

Captain of the Fleet is an adventure game for two to four players about shipping in the Great Lakes. It is an easy way to learn about the geography and economy of the Great Lakes Region from Duluth to Toronto. Captains of freighters navigate the lakes and players build fleets. For details write to Captain of the Fleet, Box 8697, Detroit, Michigan, 48224.

Computerized Land Related Information System for Ontario

The Ontario government will cost-share a three-year, $5.3 million project to develop a computerized land-related information system for provincial, municipal and private sector applications.

The system could save millions by standardizing land-related information development efforts in the province. It will enable fire engine or ambulance operators to choose the shortest response routes, using items such as addresses, traffic flow and accidents. It will aid forest fire fighting by providing computer maps which,with data such as wind velocity, moisture and fuel conditions, will help in planning fire attack and control. It will help lawyers search titles more efficiently and inexpensively, real estate agents determine the market value of land for sales purposes based on surrounding land values, and municipalities build a parcel data base and graphically display parcel boundaries, ownership, utilities and zoning. Potential for use in environmental impact assessment and resource/land management is recognized.

Revenues could reach $60 to $70 million by 1989 in developing such systems for domestic and overseas markets. At least 250 to 300 jobs could be created over 10 years.

The Ontario mapping industry and Bell Canada as well as the Ministries of Natural Resources, Consumer and Commercial Relations, Health, Municipal Affairs and Housing, the Board of Industrial Leadership and Development (BILD), the cities of Cambridge and Woodstock, and the County of Oxford will share the cost.

For more information contact: Barney Panting, Surveys and Mapping Branch, Ontario Ministry of Natural Resources, 99 Wellesley, Queen's Park, Toronto (416) 965-4538.