The Metropolitan

Water Reclamation District

of Greater Chicago

WELCOME
TO THE MAY EDITION
OF THE 2010
M&R SEMINAR SERIES

BEFORE WE BEGIN

- SILENCE CELL PHONES & PAGERS
- QUESTION AND ANSWER SESSION WILL FOLLOW PRESENTATION
- SEMINAR SLIDES WILL BE POSTED ON MWRD WEBSITE AT (www. MWRD.org)

- Home Page → (Public Interest) → more public interest → M&R Seminar Series → 2010 Seminar Series

Mr. Kevin M. Fitzpatrick

M.S., Environmental Engineering — University of North Carolina, Chapel Hill, NC
B.S., Civil Engineering — University of Illinois, Urbana, IL

December 2004 – present MWRDGC Engineering Department, Principal Civil Engineer

Project manager for McCook Reservoir and Thornton Composite Reservoir

- *Several contracts are required to complete the reservoirs, ~ $1 billion*
- *Planning, budgeting, scheduling, design, consultant management, contract preparation, right-of-way acquisition, contract bidding, post-award engineering*
- *Coordinate M&O, consultants, mining companies, Army Corps of Engineers, and contractors*

Project manager for 39th Street Conduit Rehabilitation Project

- *Manage consultant design and post award engineering for the $146 million Phase 1*

Project engineer for 73rd Street Tunnel Relocation project

January 2001 – December 2004 MWRDGC Engineering Department, Senior Civil Engineer

August 1999 – January 2001 MWRDGC M&O Department, Assistant Civil Engineer

January 1996 – August 1999 Greeley and Hanson, Project Engineer

- Project Engineer for Egan WRP Improvements project
- Project Engineer for Richmond CSO Control Tunnel
- Project Engineer for Richmond Chlorination/Dechlorination Facility
- Worked on Master Plan for Sao Paulo, Brazil wastewater treatment plants
- Worked on Lynchburg WWTP, shop drawing review and O&M manual

TARP: Past, Present, Future

Troubled Asset Relief Program

From Wikipedia, the free encyclopedia

The **Troubled Asset Relief Program**, commonly referred to as **TARP**, is a program of the United States government to purchase assets and equity from financial institutions to strengthen its financial sector. It is the largest component of the government's measures in 2008 to address the subprime mortgage crisis.

Originally expected to cost the U.S. Government $356 billion, the most recent estimates of the cost, as of April 12, 2010, is down to $89 billion, which is 42% less than the taxpayers' cost of the Savings and loan crisis of the late 1980s.[1] The cost of that crisis amounted to 3.2% of GDP during the Reagan/Bush era, while the GDP percentage of the current crisis' cost is estimated at less than 1%.[2] While it was once feared the government would be holding companies like GM, AIG and Citigroup for several years, those companies are preparing to buy back the Treasury's stake and emerge from TARP within a year.[3] Of the $245 billion invested in U.S. banks, over $169 billion has been paid back, including $13.7 billion in dividends, interest and other income, along with $4 billion in warrant proceeds as of April 2010. AIG is considered "on track" to pay back $51 billion from divestitures of two units and another $32 billion in securities.[3] In March 2010, GM repaid more than $2 billion to the U.S. and Canadian governments and on April 21 GM announced the entire loan portion of the U.S. and Canadian governments' investments had been paid back in full, with interest, for a total of $8.1 billion.[4]

Tunnel and Reservoir Plan

From Wikipedia, the free encyclopedia

The Tunnel and Reservoir Plan (abbreviated **TARP** and more commonly known as the **Deep Tunnel Project** or the **Chicago Deep Tunnel**) is a large civil engineering project that aims to reduce flooding in the metropolitan Chicago area, and to reduce the harmful effects of flushing raw sewage into Lake Michigan by diverting storm water and sewage into temporary holding reservoirs. The megaproject is one of the largest civil engineering projects ever undertaken in terms of scope, cost and timeframe. Commissioned in the mid-1970s, the project is managed by the Metropolitan Water Reclamation District of Greater Chicago. Completion of the system is not anticipated until 2019, but substantial portions of the system have already opened and are currently operational. Across 30 years of construction, over $3 billion has been spent on the project.[1]

Contents

PAST
TARP History

History of Tunneling in Chicago

- Chicago's first water tunnel placed in service in 1867
  - 5' brick tunnel in clay
  - 60 feet below Lake Michigan
  - Extended 2 miles into the lake
- Chicago's first rock tunnel completed in 1911
  - 9' to 14' diameter
  - 102 to 160 feet deep
  - $79/foot for the concrete lined 14' section
- Over 65 miles of water tunnels larger than 9'


13872
APR. 17, 28

Chi Tribune 4/3-58

SANITARY BODY ACTS TO AVERT FLOOD THREATS

Sanitary district trustees moved yesterday to ease the danger of floods along the Illinois waterway just below Chicago. They instructed Horace Ramey, chief district engineer, to confer with Col. John P. Corey, chief army district engineer, on a plan to put back into working condition the flood control gates on the Brandon dam just below Joliet.

"Of the 21 sluice gates on that dam, all except three are rusted beyond working order," William F. Patterson, vice president of the board, told the other trustees. "If the Joliet area is flooded by heavy rains, we will be blamed altho we have no jurisdiction over the gates which could relieve the danger."

Tells of Recent Perils

Ramey said the army engineers were unable to open the gates during the heavy rains of 1954 and 1957. Storm waters came within six inches of flooding Joliet during last year's heavy July 12 downpour, Ramey added.

The board also formally approved the sale of 2 million dollars in revenue bonds to Halsey Stuart & Co., Inc., to finance construction of a sanitary-storm sewer for Mount Prospect. These are the first revenue bonds ever issued by

CHICAGO SUN-TIMES, FRIDAY, FEBRUARY 28, 195

Press Plan For Flood Curbs Here

Metropolitan Sanitary District of Greater Chicago trustees voted Thursday to present a new flood-control program to the Illinois General Assembly next year.

The decision was made, after he district's chief engineer, Horace P. Ramey, warned that nless the district acted now he increased flow of water from orm sewers would create "inlerable conditions" by 1970.

Must Keep Pace

He said the district must keep ce with the City of Chicago, ich is spending $166,000,000 step up its storm-sewer caity. Otherwise, he said, the rict will face these alterna- by 1970:

e forced to open up the cks of the Chicago River lischarge storm water into Michigan as it did during ak storm in 1955.

use millions of dollars of operty loss in Cook County.

mey's suggestion for a control program calls for ing of the Sanitary & Canal from the Calumet- hannel to Lockport from o 300 feet and also to it. Excavation alone cost an estimated $30,- 0, he said.

a program, when com- would double the present of the district's water- nd take the stepped-up e load of the city's ewers. He said the city would send as much as cubic feet per second district's canals.

VOTE TO DREDGE CHANNEL TO CUT FLOOD DAMAGE

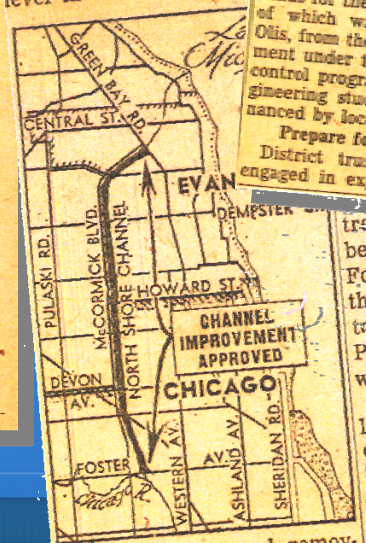
Sanitary district trustees voted yesterday to dredge the North Shore channel and cut trees along its banks in the 6½ mile stretch between Foster av. in Chicago and Green Bay rd. in Evanston. The job will take about a year and cost an estimated $900,000, said William A. Dundas, district superintendent.

Scrubby willow and cottonwood trees and underbrush will be removed but good shade trees will be spared, said Dundas.

Silt to Be Removed

An average accumulation of silt three feet deep will be removed and spoilage will be placed in low areas along the banks. Deepening the channel is desirable to hasten the run off of storm water.

After a heavy rain the water level in the channel ris



because Strea
Fox River wat
the cost of r
tor sewers
Plaines rive
would be pl

Also authorized
lease of a 200 by 260 feet plot
on the east bank of the North
Shore channel, north of Howard st., for erection of a medical center. The lessee will be
Dr. Harold Dubner.

Chi Tribune 3/31-58

Envision Use of I-M Canal in Flood P

Cost of Project Is Placed at 500 Million

BY RUSSELL FREEBURG

Details of a 500 million dollar Chicago area flood control program which would use the abandoned Illinois-Michigan canal as a giant storm sewer were disclosed yesterday by Anthony Olis, president of the sanitary district.

The project, conceived to meet a growing flood problem, would include construction of a large reservoir southwest of Joliet to hold runoff water from rainstorms until flood dangers subsided.

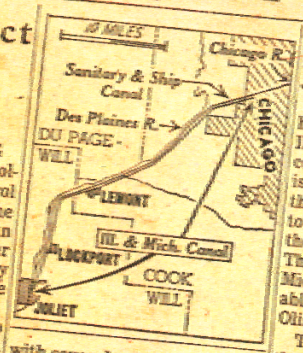
Connection to Reservoir

The old Illinois Michigan canal channel, which belongs to the state division of waterways, would be connected to the reservoir by an open ditch or aqueduct. Outflow from the reservoir could be controled by seepage into the ground or by locks into either the nearby Des Plaines or Illinois rivers.

The district plans to seek funds for the project, the cost of which was estimated by Olis, from the federal government under the latter's flood control program. Only an engineering study would be financed by local taxes.

Prepare for Congress

District trustees now are engaged in exploratory talks



with several engineering firms about an engineering appraisal, Olis said. The district also will seek the coöperation of the army corps of engineers.

It is hoped, Olis said, that the study can be completed by July. The rest of the year would be spent in preparing the matter for presentation to Congress in 1959.

Olis said a major up to date flood control program for the Chicago area is a must. New construction has increased rainfall runoff until thousands of homes and streets are flooded each year.

The sanitary and ship canal winding southwest from Chicago toward the Mississippi river basin, Olis said, no longer is able to handle the runoff by itself. The critical point is at Joliet, where water was within 6 inches of the top of the sanitary and ship canal's dikes during the heavy rains of last July.

Parallels Ship Canal

The Illinois-Michigan canal parallels the sanitary and ship canal. It once extended 96 miles from the Chicago river at Ashland av. to the Illino

river at La Salle. It joins the sanitary and ship channel in Joliet.

The Illinois-Michigan canal has not been used since 1907. It was completed in 1848 at a cost of 9½ million dollars. It is planned to use a stretch of the canal bed from Damen av. to just west of Harlem av. for the southwest expressway. The remainder of the Illinois-Michigan canal would be available for the sanitary district, Olis said.

The district plan would use the Illinois-Michigan channel to supplement the sanitary and ship canal, which

said, Chicago wou
blame for downsta
along the Illinois
Illinois carries wa
Des Plaines river
Chicago to the Mis

60 Feet Wi

John W. Towne,
engineer of sewer
the sanitary district,
Illinois-Michigan c
roughly 60 feet wi
with about 90 feet
side for widening
that it would have
widened and

CHICAGO DAILY NEWS, Tues., Aug. 20, '57 ★★ 15

City Spurs Action On Drainage Plan

Engineers Cite Recent Floods, Map Bid to '59 Legislature

Recent Chicago-area floods have prompted Sanitary district engineers to renew efforts for expansion of the district storm water drainage facilities.

A proposal for construction of a storm sewer outlet system will be placed before the 1959 state legislature, said Peter F. Girard, the district's sewer design engineer.

He said the proposal will be a revision of a similar plan which failed to get approval of the 1955 session.

It calls for construction of a storm sewers that would drain into the Illinois waterway through the Calumet Sag, North Shore channels and the Chicago and Des Plaines rivers.

* * *

GIRARD SAID the project would be financed through a bond issue that would require approval of the legislature.

He said it would cost at least 10 per cent more than the $72 million bond issue needed for the project proposed in 1955.

At present the district main-

only. Storm waters must d
through the channels.

* * *

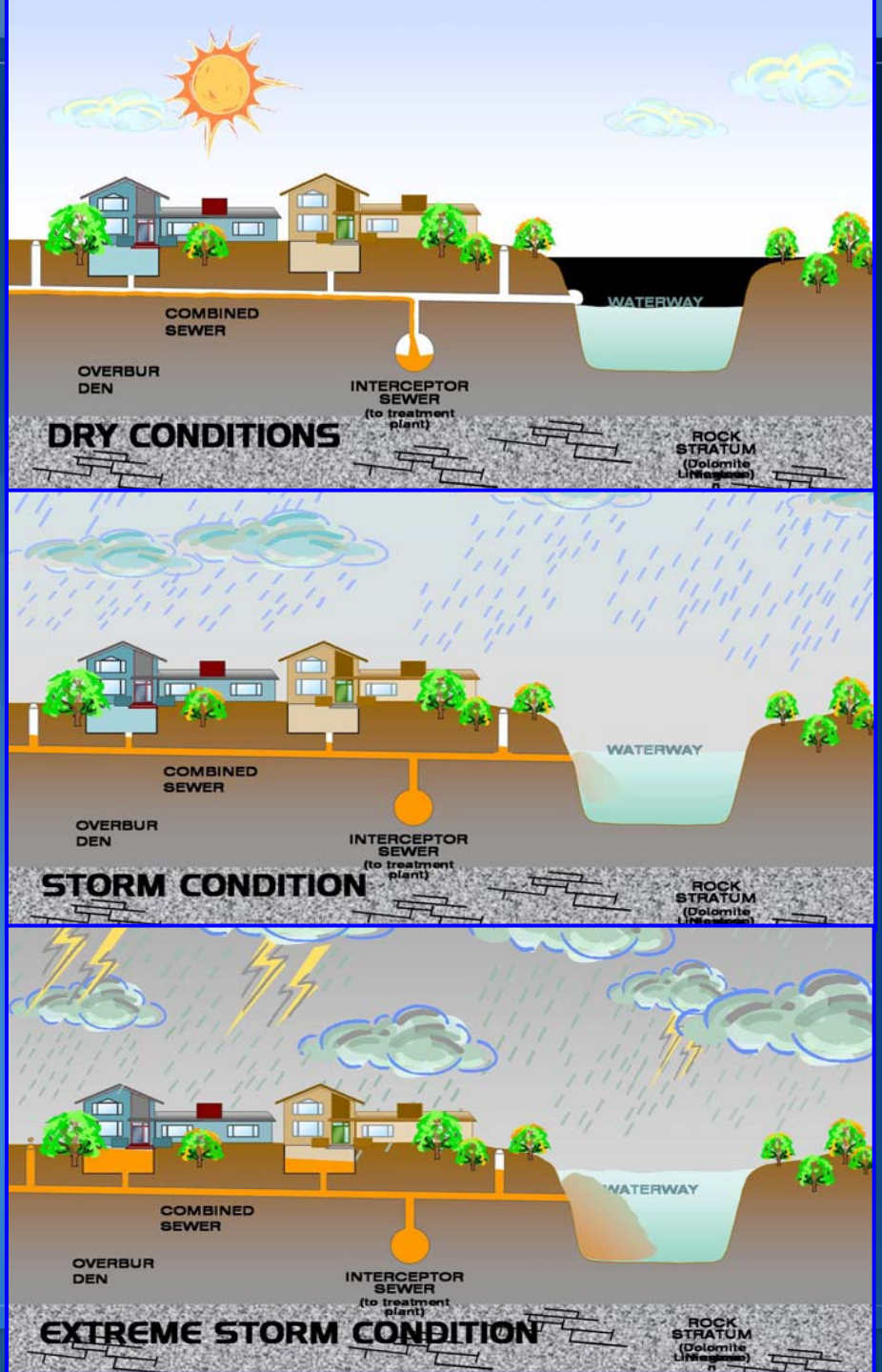
THE PROPOSED st
drainage system would s
primarily suburban and r
areas.

**Drainage in most of C
cago is effected at pres
through a combined se
system that carries b
wastes and storm waters.**

Girard said his staff w
begin revising the 1955
posal by October.

Rights Parley

Charles S. Zimmerman, c
man of the AFL-CIO
rights department, will be
major speaker at the thir
nual civil rights confer
Saturday, Nov. 16, in the
man Hotel. The Jewish
Committee is sponsor o

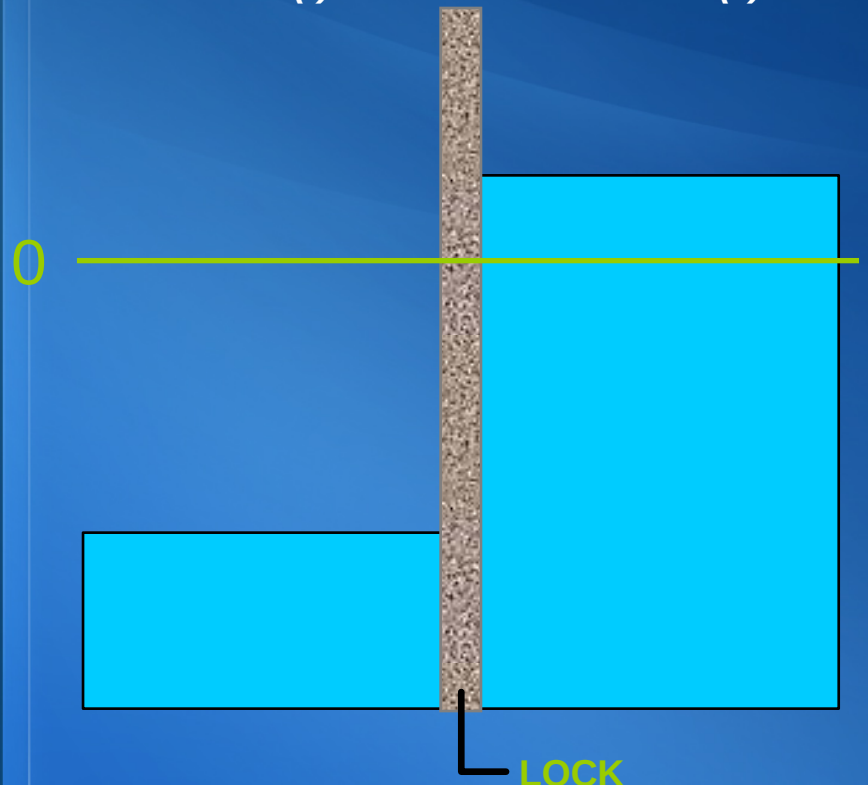

WATERWAY
COMBINED SEWER
OVERBUR DEN
INTERCEPTOR SEWER
(to treatment plant)
DRY CONDITIONS
ROCK STRATUM
(Dolomite
WATERWAY
COMBINED SEWER
OVERBUR DEN
INTERCEPTOR SEWER
(to treatment plant)
STORM CONDITION
ROCK STRATUM
(Dolomite
WATERWAY
COMBINED SEWER
OVERBUR DEN
INTERCEPTOR SEWER
(to treatment plant)
EXTREME STORM CONDITION
ROCK STRATUM
(Dolomite

REVERSING THE CHICAGO RIVER TO HELP STEM THE FLOOD

NORMAL

RIVER LEVEL
ELEVATION (-)2 FT.

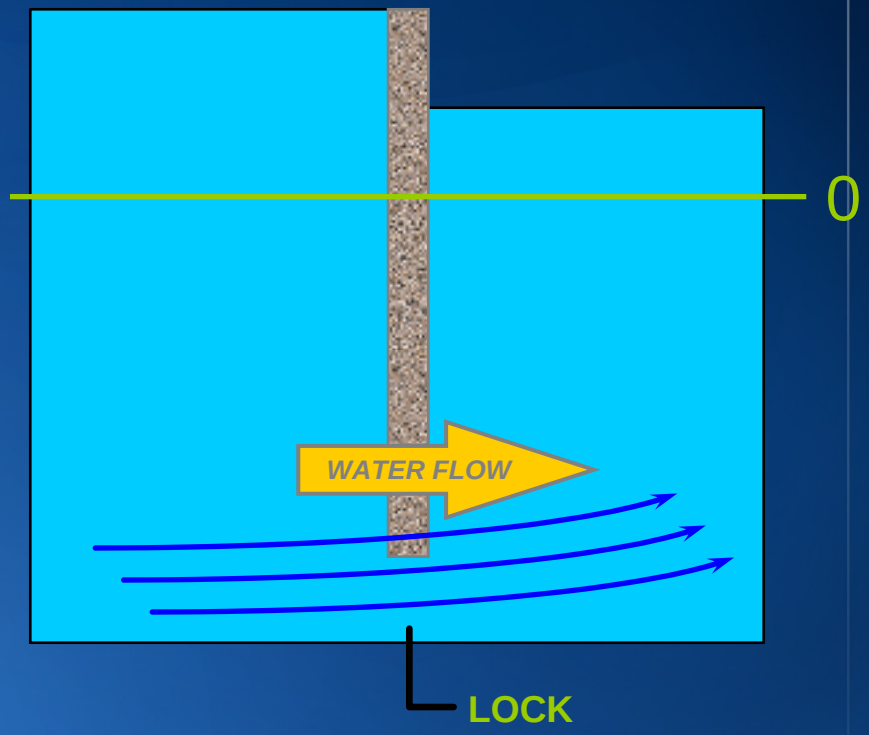
LAKE LEVEL
ELEVATION (+)2.8 FT.

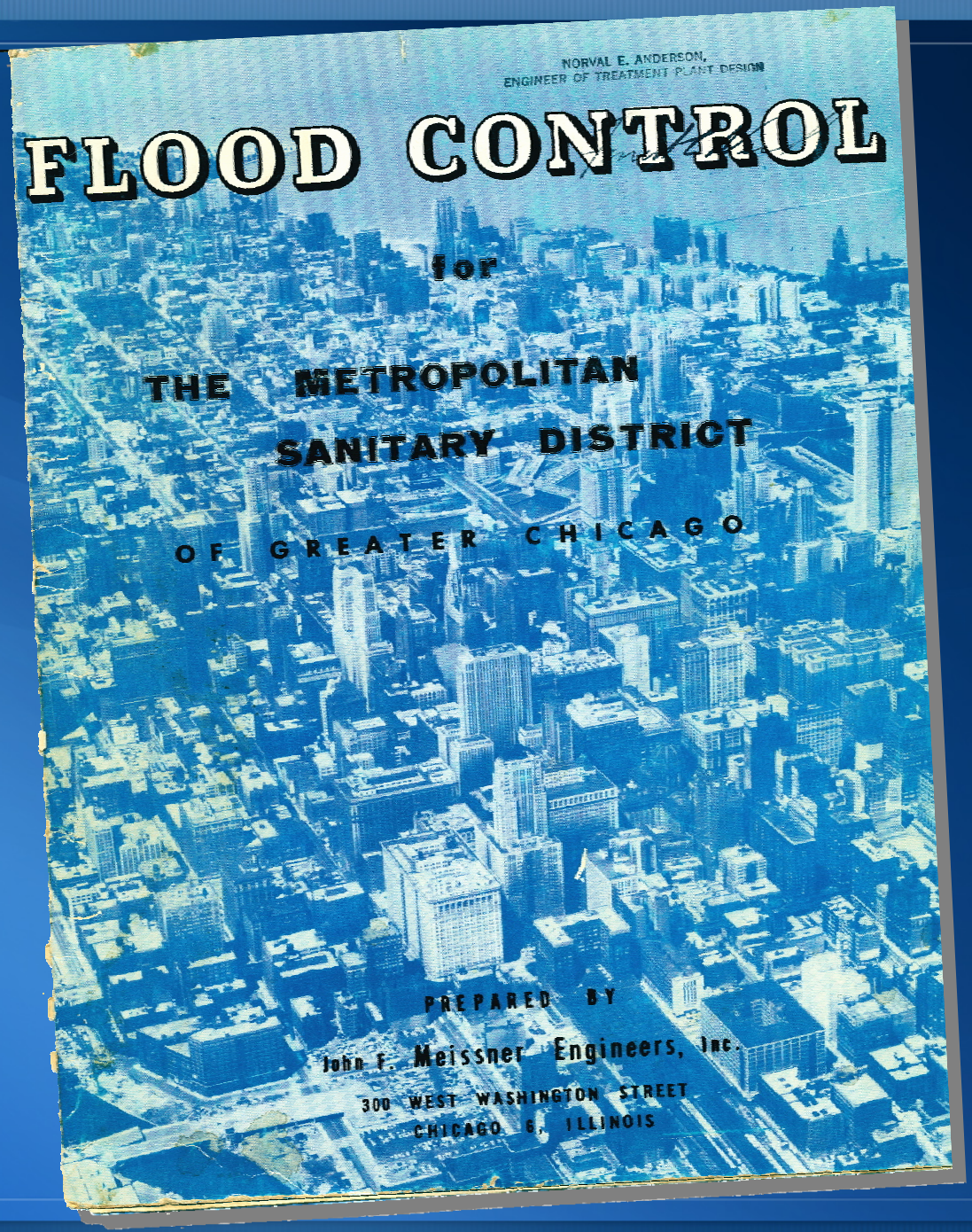


DURING MAJOR STORM

RIVER LEVEL
ELEVATION (+)3.5 FT.

LAKE LEVEL
ELEVATION (+)2.8 FT.




NORVAL E. ANDERSON,
ENGINEER OF TREATMENT PLANT DESIGN
FLOOD CONTROL
for
THE METROPOLITAN
SANITARY DISTRICT
OF GREATER CHICAGO
PREPARED BY
John F. Meissner Engineers, Inc.
300 WEST WASHINGTON STREET
CHICAGO 6, ILLINOIS

A tabulation, showing the storage basin volumes and the channel discharges for 17 sub-basins, for drainage, covering the entire Cook County region, is shown (page 52). The total of all the channel discharges amounts to 148,000 cfs.

Then (page 53) is listed the suggested program and works recommended for construction, as follows:

1. Creation of a central authority for flood control.
2. Installation of transmitting instruments and centralized recording devices for control of operation of works.
3. Chicago River Pumping Station
4. Widening and deepening of the Ship Canal
5. Reservoirs and channel improvements on the North Branch of the Chicago River.
6. Channel improvement and pumping station for the North Shore Channel.
7. Reservoir to control the upper Des Plaines River.
8. Reservoirs and channel improvements on Salt Creek
9. Reservoirs and channel improvements on the Des Plaines River between Gurnee and Riverside.
10. Reservoirs and channel improvements on Thorn Creek
11. A pumping station, new channels, and improvements for the Little Calumet River.
12. New sewer pumping stations at 125th and 95th Streets, and reservoirs on Tinley and Stony Creeks.

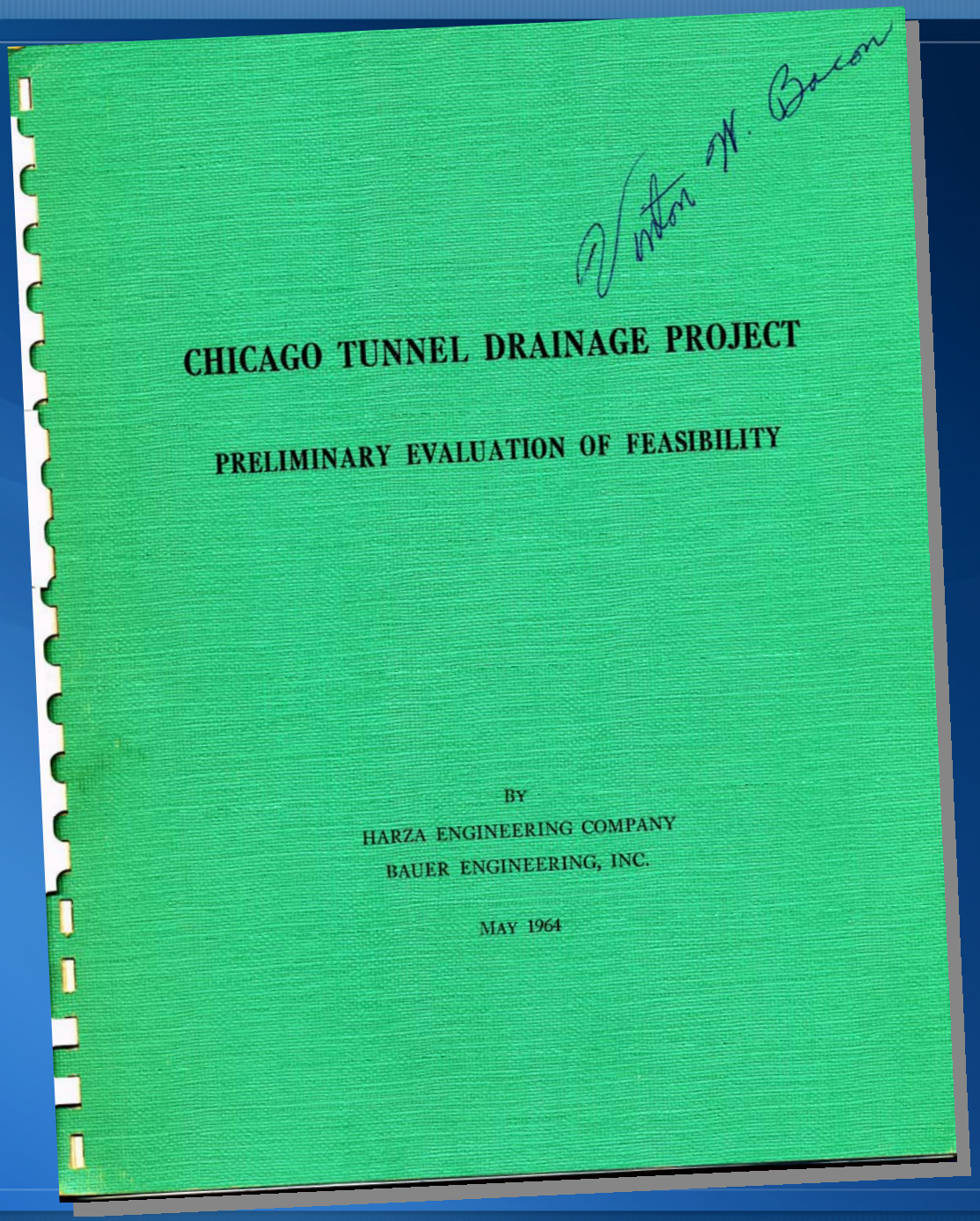
These items will be discussed individually, below.

Central Authority for Flood Control

The need for a central authority for Flood Control is so obvious that it needs no discussion. Water always runs down hill, without regard to any political lines. A comprehensive flood control plan must be devised on an area-wide basis; and the watersheds of the streams involved are items which must be considered, rather than the limits of the municipalities served. The most obvious agency, now in existence, to handle flood problems, is, of course, The Metropolitan Sanitary

Flood Control Coordinating Committee

- In existence on and off since 1957
- Consisted of representatives of:
  - Illinois Department of Public Works
  - Cook County
  - The City of Chicago
  - District
- Created a Technical Advisory Committee in 1968 to review various plans and develop recommendations for course of action


Vinton W. Bacon
CHICAGO TUNNEL DRAINAGE PROJECT
PRELIMINARY EVALUATION OF FEASIBILITY
BY
HARZA ENGINEERING COMPANY
BAUER ENGINEERING, INC.
MAY 1964

Early Deep Tunnel Plan Highlights

- Relief of all sewers via new mains and vertical drains
- Underground storage reservoir composed of 33-foot diameter “moled” tunnels and drill and blast chambers located 600’ below ground.
- Power Generation – reversible pumps/turbines to generate electricity during peak demand periods.
- Surface reservoir to store water for electricity generation.
- Treatment is included in the system –primary settling in the underground reservoirs, screening at the pumps, aeration at the pumps and turbines, secondary settling at the surface reservoir.
- Alternative treatment at the WRPs if needed.

Project to be Initiated in the Chicago Calumet Area

Push Area Tunnel-Storage Flood Plan

The first phase of a multi-million-dollar flood and pollution control plan involving deep tunnels in the rock strata under the Chicago area was announced Friday by the Sanitary District.

Frank W. Chesrow, the district's president, said federal funds would be sought immediately to help finance a second stage. It will be a $777,000 feasibility study.

The pre-feasibility study, released Friday, favorably compared the cost of the proposed system, with tunnels 800 to 900 feet below the surface, to the cost of conventional plans for the Calumet area of Chicago.

CHICAGO SUN-TIMES
Founded by Marshall Field III
Published by Field Enterprises, Inc., at 401 N. Wabash Av., Chicago, Ill., 60611. Phone 321-3000.
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Second-class postage paid at Chicago, Ill.

Cost Estimates

Valentine Janicki, chairman of the district's flood control committee, said costs of conventional sewers for storm water drainage have been estimated at $62,000,000 for that area and the deep tunnel system has been estimated at from $52,000,000 to $67,000,000 — but he said, with benefits impossible under the usual plan.

Janicki said the system would allow for immediate drainage of storm water through vertical shafts to deep tunnels with a diameter of 33 feet.

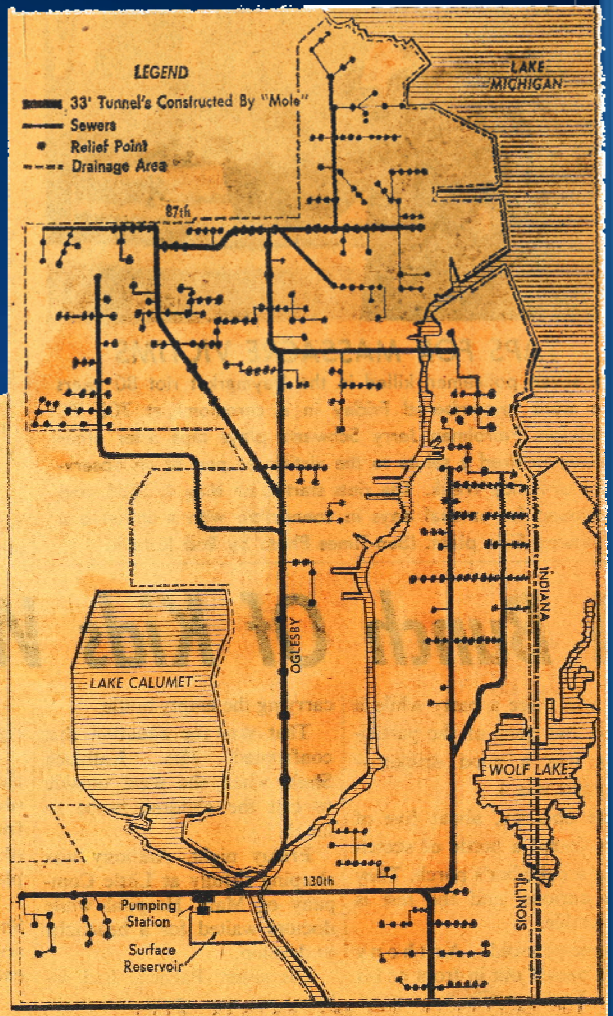
These tunnels would lead to vast caverns hewn in the rock. Storm water stored in the caverns and in the tunnels would be pumped to a surface reservoir and into the waterways during dry weather.

Benefits Cited

Janicki said benefits of the tunnel storage plan beyond conventional storm sewers would be:

1. Storm water overflow from combined sewers could be stored and given treatment before it is discharged into the waterways, thus reducing pollution.
2. Flood protection of an extent not possible under the conventional system.
3. The reservoir area could be used to provide additional treatment for effluent from sewage treatment plants and for spare capacity for these plants.

The pre-feasibility report, financed with a $125,000 grant from the federal Water Pollution Control Administration, was prepared by Bauer Engineering Inc. and the Harza Engineering Co.



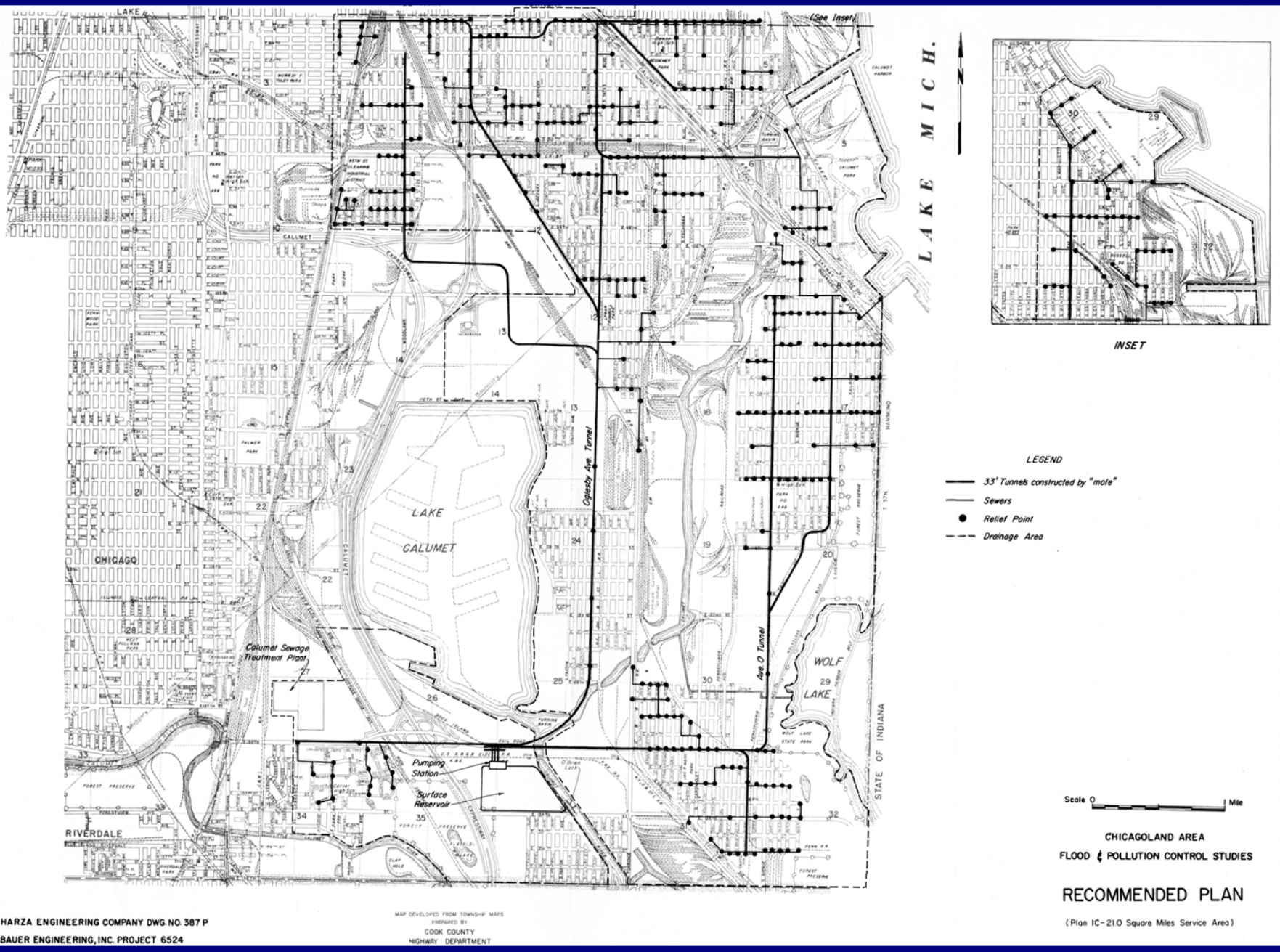
The recommended plan for flood tunneling. (Sun-Times Map)

Project Expanded Throughout Combined Sewer Area

- Part A – Storage and Treatment
  - Combined sewer area served by two systems, McCook and Calumet, with an interconnecting tunnel
  - Pumps and turbines
  - Treatment at both the Stickney and Calumet WRPs
- Part B – Conveyance Facilities
  - Overflow structures at CSO points, vertical shafts, tunnels, subsurface settling chambers to provide primary treatment, and sludge pumping
- Part C – Local Sewer Improvements
  - Possible surface reservoirs
  - New local (relief) sewers and tunnels

Various Aspects Considered During Planning, but not Implemented

- Power generation by dropping water through turbines during peak power periods
- Creation of recreational facilities such as toboggan and ski hills with excavated rock
- Waterway overflows to tunnel system, discharging at Lockport
- Possible extension of system to serve NW Indiana, Lake County, IL and DuPage County, IL


LAKE MICH.
(See Inset)
INSET
LEGEND
33' Tunnels constructed by "mole"
Sewers
Relief Point
Drainage Area
LAKE CALUMET
CHICAGO
RIVERDALE
CALUMET
Calumet Sewage Treatment Plant
Pumping Station
Surface Reservoir
Ogden Ave. Tunnel
Ave O Tunnel
WOLF LAKE
STATE OF INDIANA
Scale 0 Mile
CHICAGOLAND AREA
FLOOD & POLLUTION CONTROL STUDIES
RECOMMENDED PLAN
(Plan 1C-21.0 Square Miles Service Area)
HARZA ENGINEERING COMPANY DWG. NO. 387 P
BAUER ENGINEERING, INC. PROJECT 6524
MAP DEVELOPED FROM TOWNSHIP MAPS
PREPARED BY
COOK COUNTY
HIGHWAY DEPARTMENT

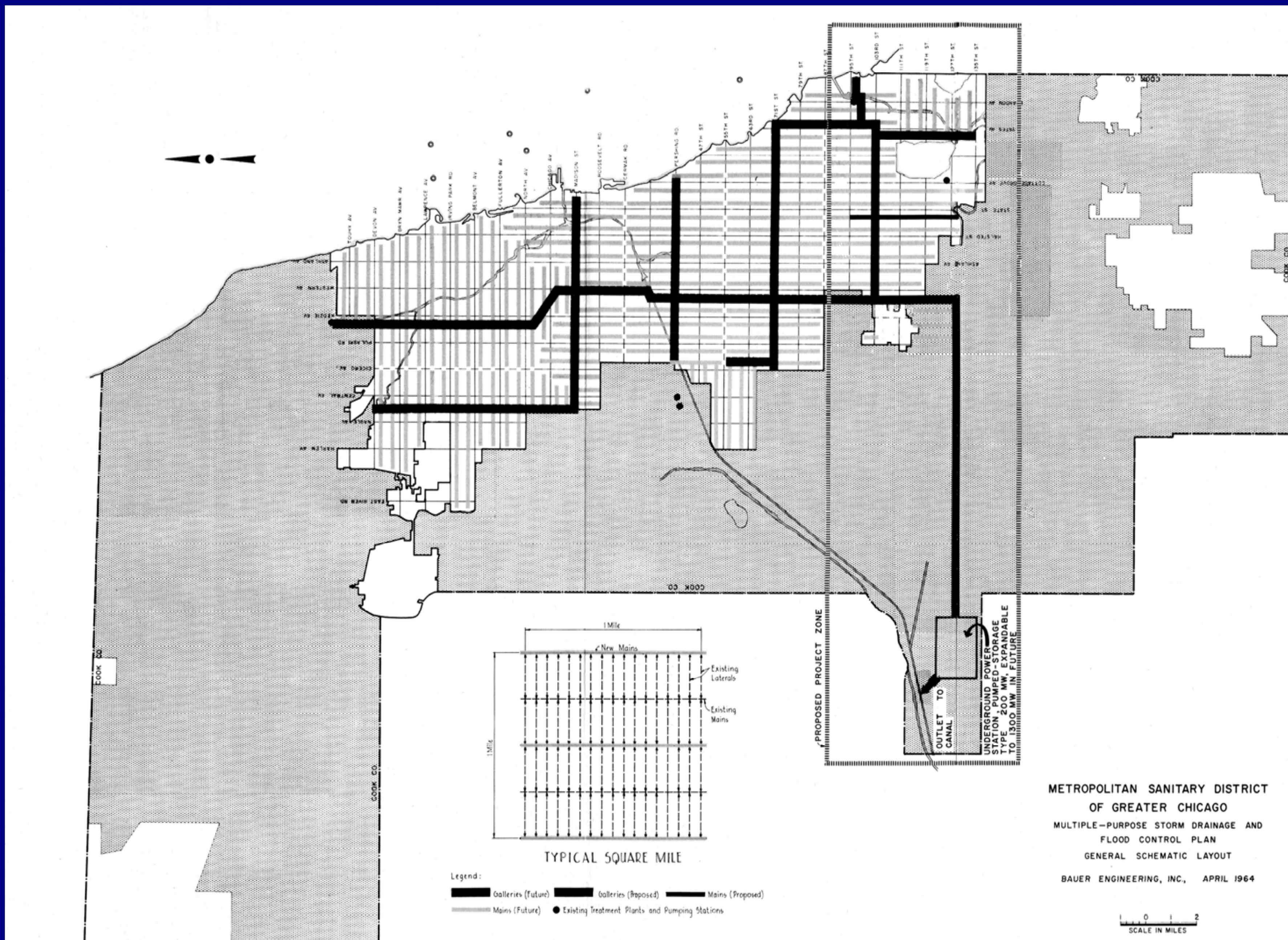
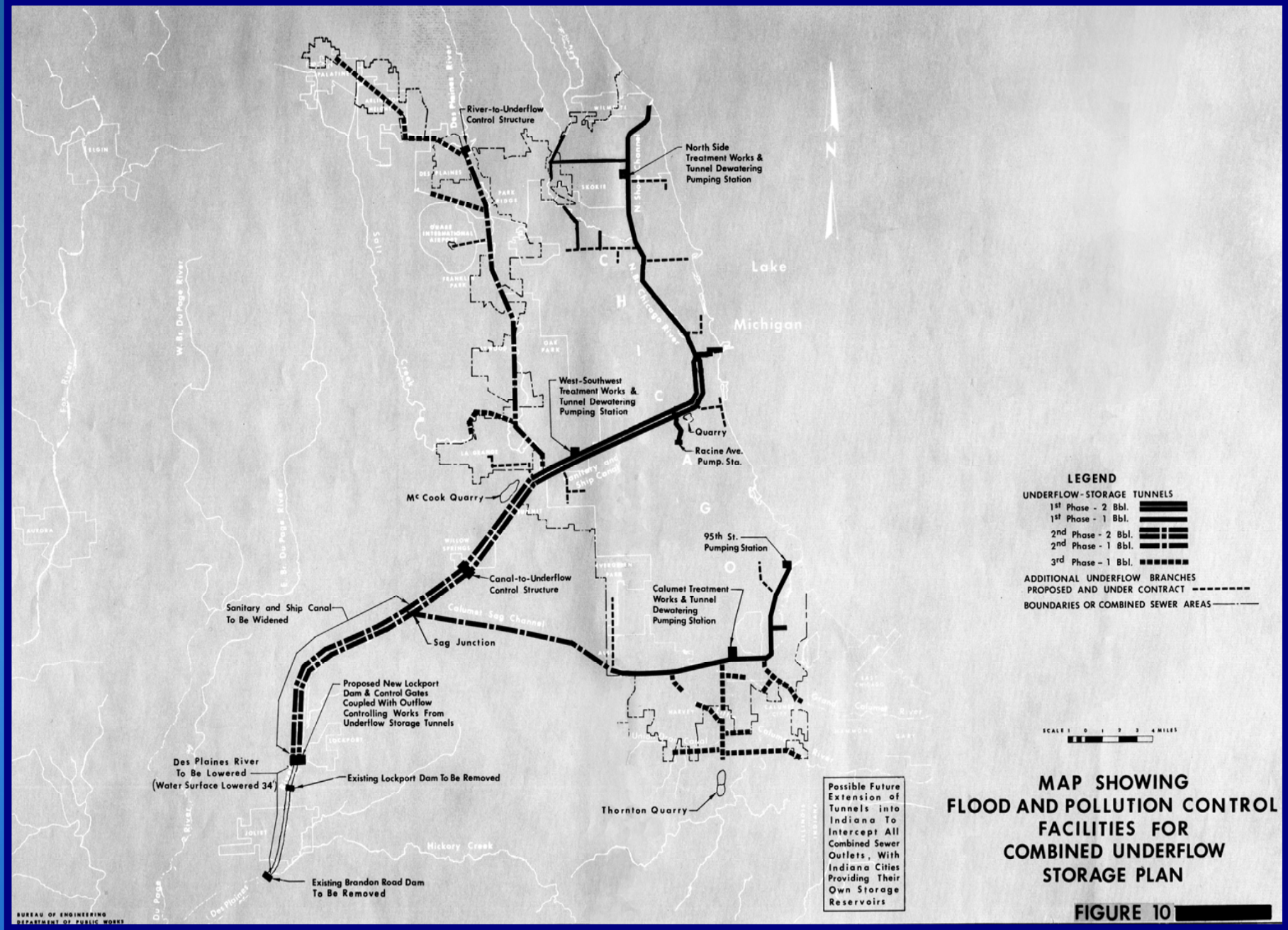

METROPOLITAN SANITARY DISTRICT
OF GREATER CHICAGO
MULTIPLE—PURPOSE STORM DRAINAGE AND
FLOOD CONTROL PLAN
GENERAL SCHEMATIC LAYOUT
BAUER ENGINEERING, INC., APRIL 1964
SCALE IN MILES
TYPICAL SQUARE MILE
1 Mile
New Mains
Existing Laterals
Existing Mains
Legend:
Galleries (Future)
Galleries (Proposed)
Mains (Proposed)
Mains (Future)
Existing Treatment Plants and Pumping Stations
PROPOSED PROJECT ZONE
UNDERGROUND POWER STATION, PUMPED-STORAGE TYPE 200 MW, EXPANDABLE TO 1300 MW IN FUTURE
OUTLET TO CANAL
COOK CO.


EXHIBIT 5
TUNNEL TO LAKE COUNTY ILLINOIS
TUNNEL TO DU PAGE COUNTY
TUNNEL TO SW COOK COUNTY SUBURBS
SHIP CANAL NAVIGATION PROJECT
TUNNEL TO LAKE COUNTY INDIANA
LAKE MICHIGAN
FIRST CONSTRUCTION ZONE
COOK COUNTY
DU PAGE COUNTY
WILL COUNTY
O'HARE FIELD
CHICAGO SANITARY AND SHIP CANAL
CALUMET SAG CHANNEL
LEGEND
Service area
Treatment plant
Pumping station
Part A
Part B
Scale 1 0 1 2 3 4 Miles
GREATER CHICAGO
POLUTION AND FLOOD CONTROL SYSTEM
POSSIBLE EXTENSIONS
BAUER ENGINEERING INC.
HARZA ENGINEERING COMPANY DWG. NO.



MAP SHOWING FLOOD AND POLLUTION CONTROL FACILITIES FOR COMBINED UNDERFLOW STORAGE PLAN

FIGURE 10

Alternative Projects

- Sewer separation – no flood control, storm sewer pollution would persist
- Storage in existing sewers – very limited capacity
- Widening and deepening existing waterways to provide flood control
- End of pipe controls for pollution control.

Underflow Sewers

- Lawrence Avenue Tunnel
  - Sizing criteria using computer studies in 1966
  - Dropshaft design based on hydraulic model studies by St. Anthony Falls Hydraulic Laboratory
  - Awarded in Nov. 1967 by the City of Chicago
- Calumet IS 18E ext. A
  - Awarded in May 1968 by the District
- Southwest IS 13A
  - Awarded in June 1968 by the District
- Mt. Greenwood and Nashville Ave. tunnels came later.

Lawrence Avenue Tunnel

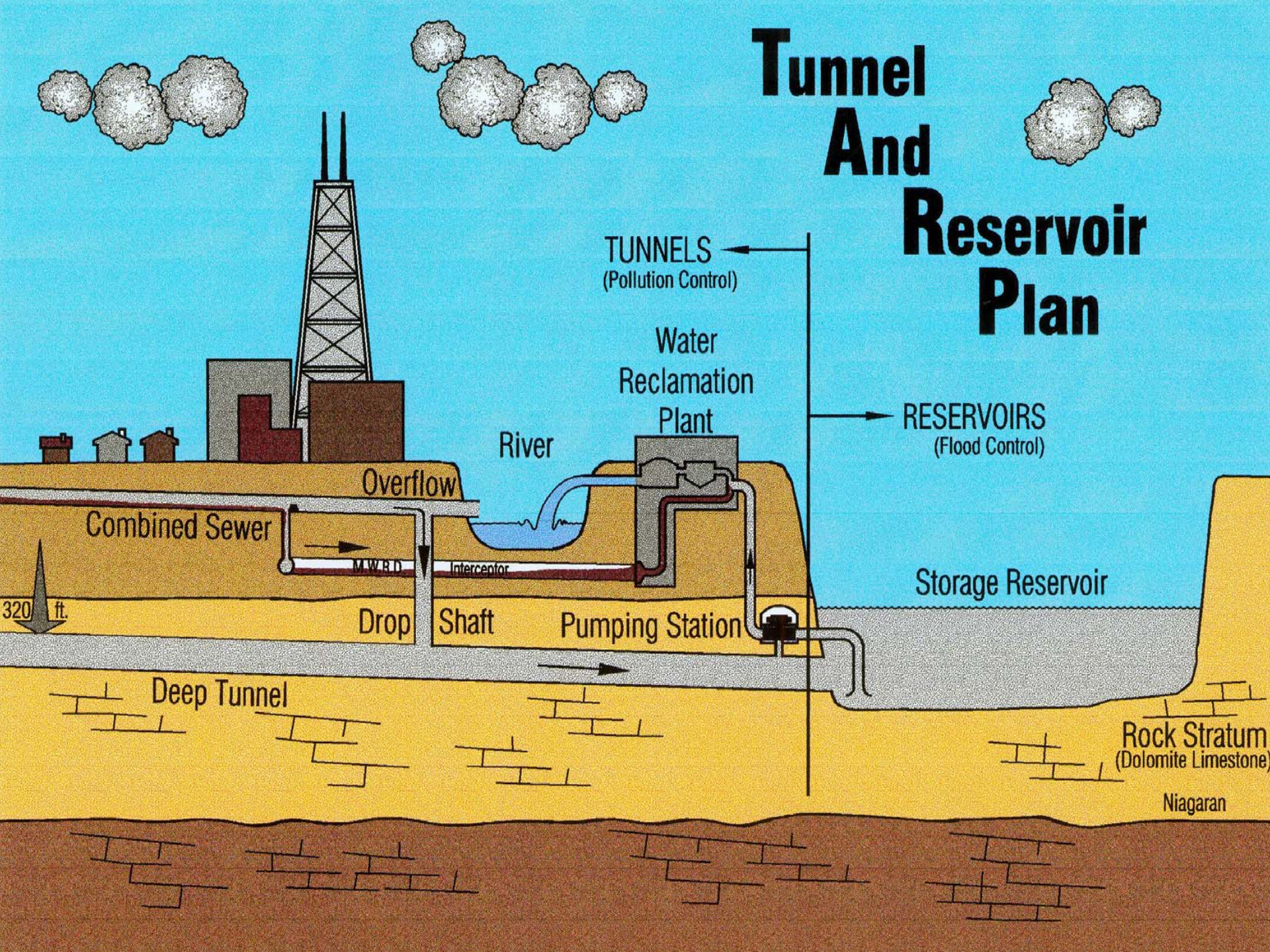
- Contract No. 1: $10.8M
  - 16,638 feet of 12’ tunnel and 9,126 feet of 17’ concrete-lined rock tunnel and 27’ construction shaft (lining was later deleted from the 12’ section for a credit)
- Contract No. 2B: $3.4M
  - 10 drop shafts
- GW Monitoring wells, upper level sewers and connecting structures, pumping station and outfall were under separate contracts

Tunnel and Reservoir Plan

- More Than 50 Alternative Plans Developed and Evaluated Over a 7 Year Period
- TARP was the Composite of the 8 Best Alternatives
- Recommended by FCCC
- Adopted by MWRDGC on October 26, 1972 – 8 days after the Clean Water Act was enacted.

TARP Goals

- ***Protect*** **……. Lake Michigan from River Backflows**
- ***Eliminate*** **…… Waterway Pollution Caused by CSO**
- ***Provide*** **……... An Outlet for Flood Waters to Reduce Basement Sewage Backups**
- ***Comply*** **……... With Federal and State Environmental Laws**
- ***Accomplish*** **... The Above Results in the Most Cost Effective Manner**


Tunnel And Reservoir Plan
TUNNELS
(Pollution Control)
Water Reclamation Plant
RESERVOIRS
(Flood Control)
River
Overflow
Combined Sewer
M.W.R.D. Interceptor
Storage Reservoir
320 ft.
Drop Shaft
Pumping Station
Deep Tunnel
Rock Stratum
(Dolomite Limestone)
Niagaran

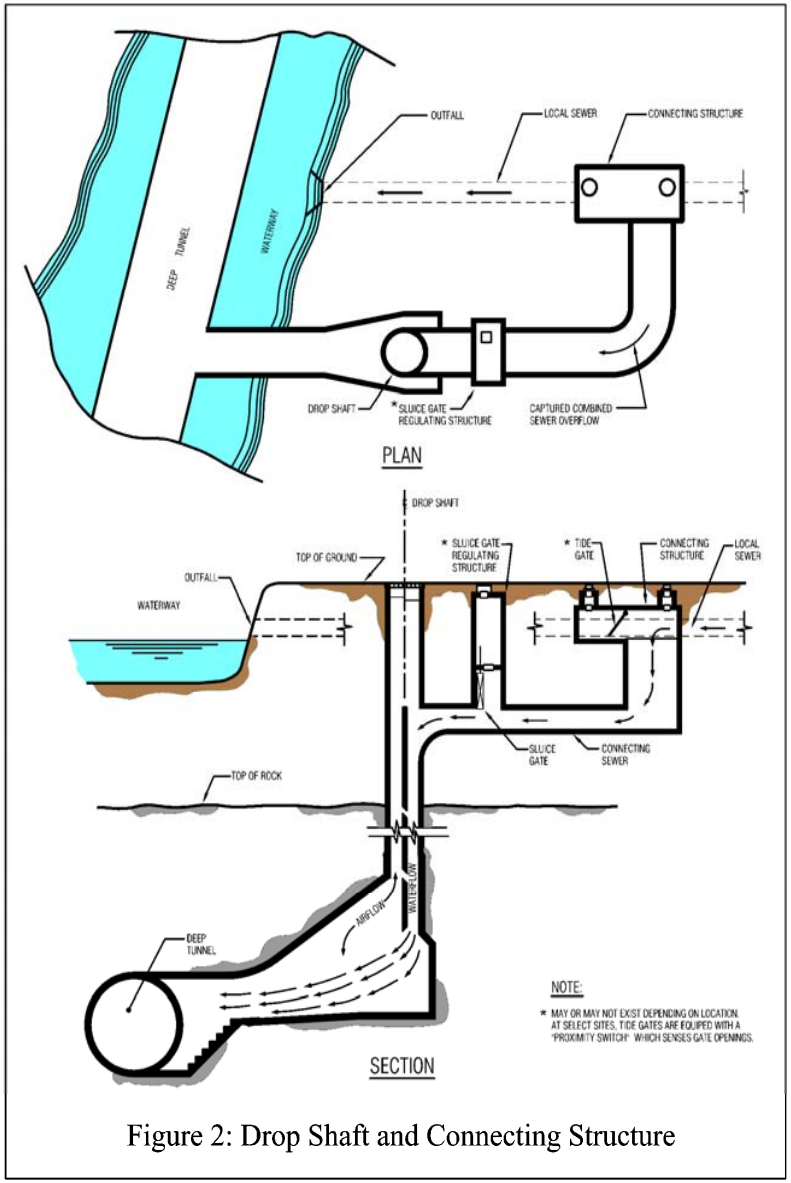
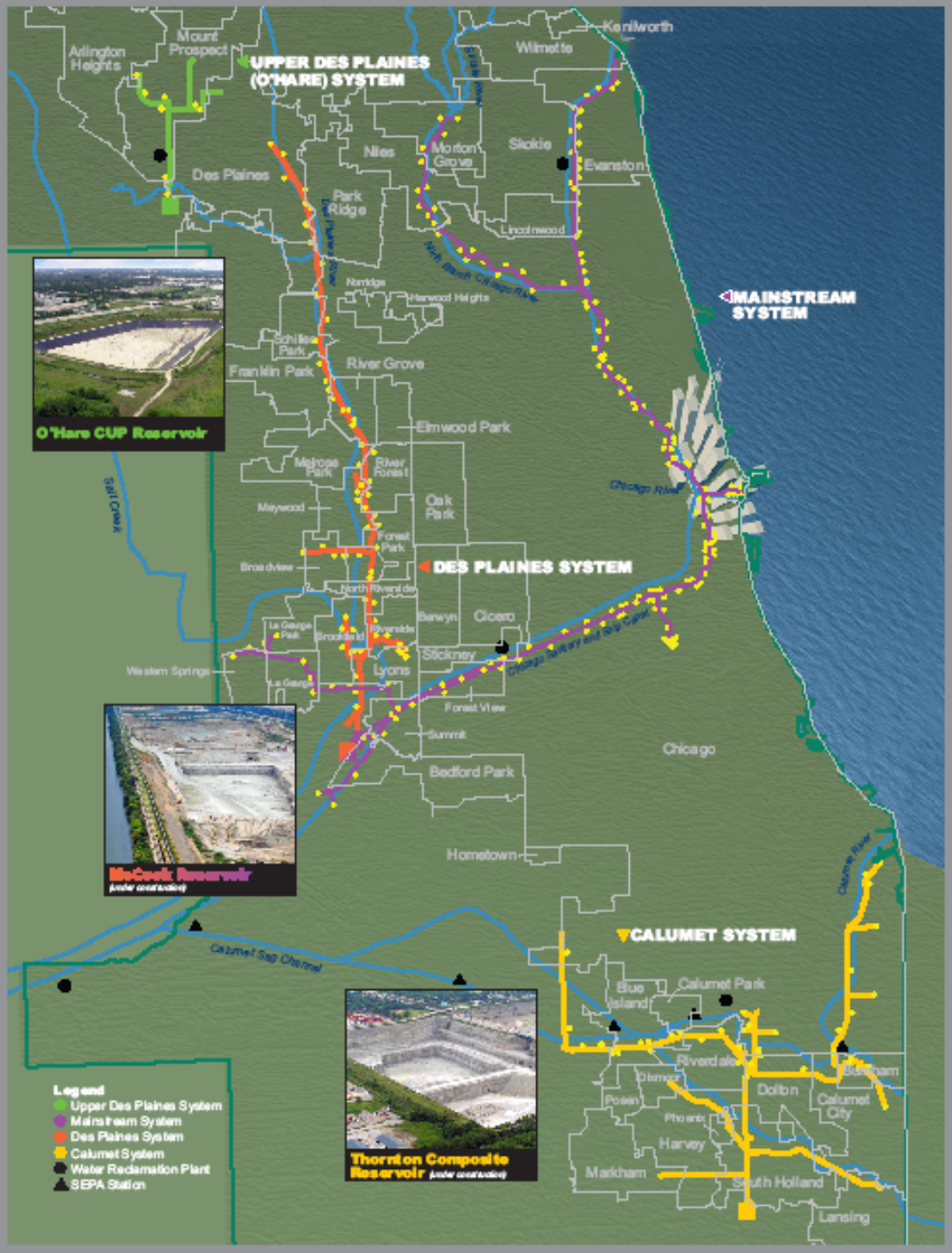
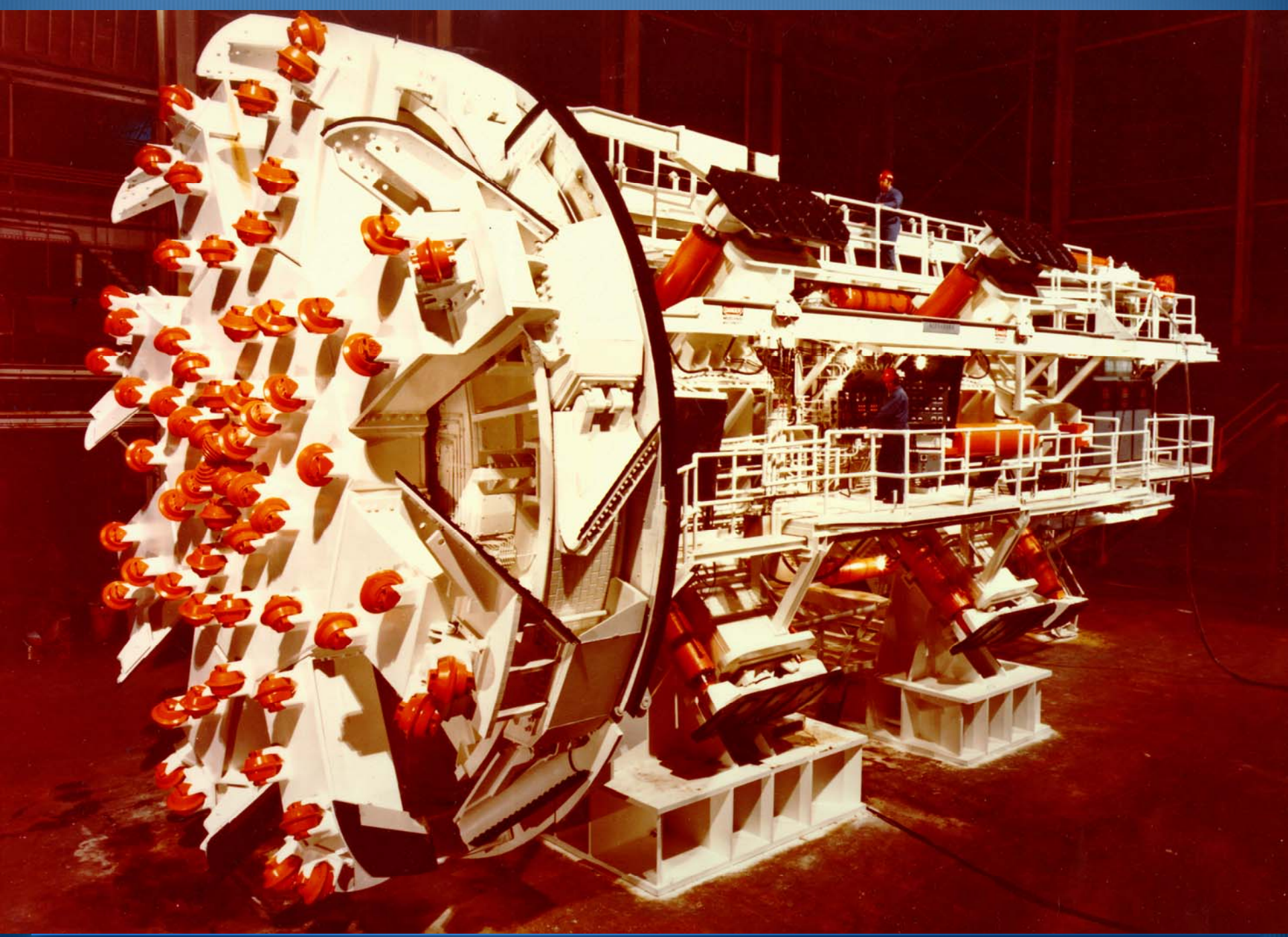


Figure 2: Drop Shaft and Connecting Structure

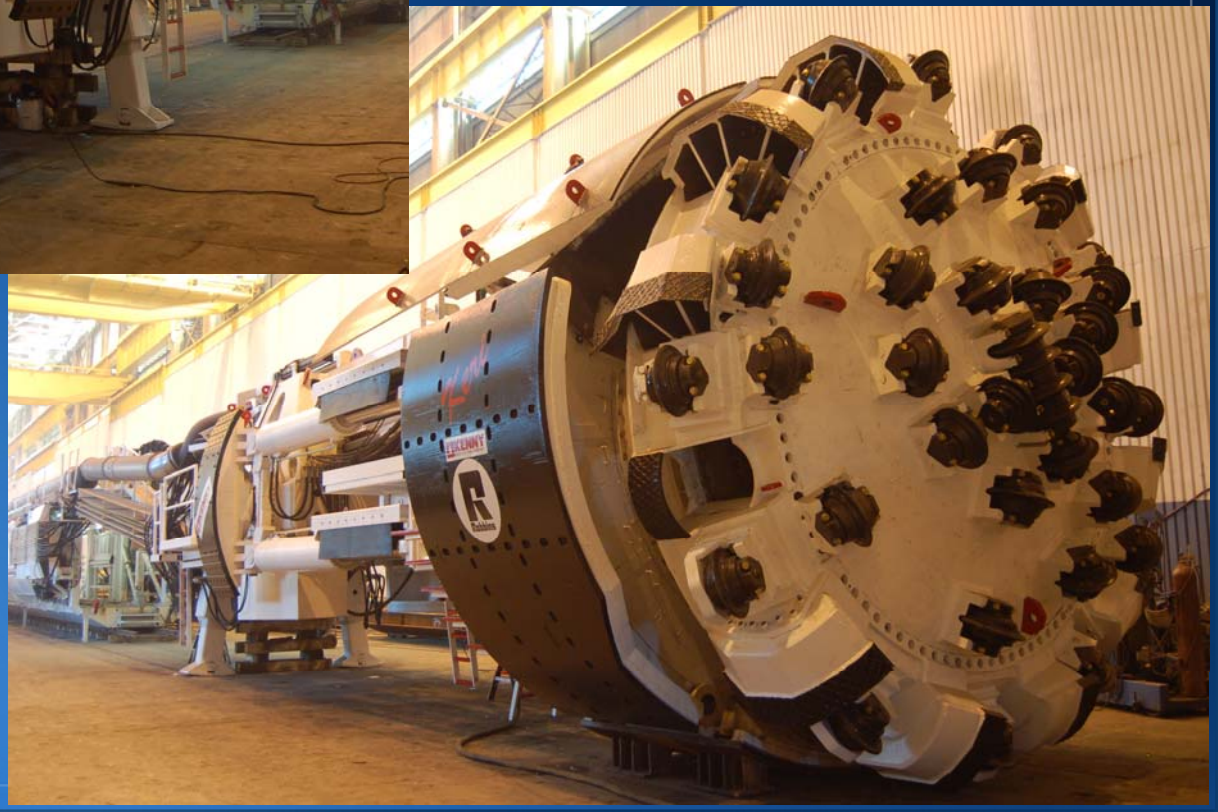

UPPER DES PLAINES (O'HARE) SYSTEM
MAINSTREAM SYSTEM
DES PLAINES SYSTEM
CALUMET SYSTEM
O'Hare CUP Reservoir
McCook Reservoir
Thornton Composite Reservoir
Legend
Upper Des Plaines System
Mainstream System
Des Plaines System
Calumet System
Water Reclamation Plant
SEPA Station
Arlington Heights
Mount Prospect
Des Plaines
Park Ridge
Niles
Morton Grove
Skokie
Evanston
Wilmette
Kenilworth
Lincolnwood
Norridge
Harwood Heights
Schiller Park
Franklin Park
River Grove
Elmwood Park
Melrose Park
River Forest
Maywood
Oak Park
Forest Park
Broadview
North Riverside
Berwyn
Cicero
Riverside
Brookfield
La Grange Park
Stickney
Lyons
Western Springs
La Grange
Forest View
Summit
Bedford Park
Hometown
Chicago
Blue Island
Calumet Park
Riverdale
Dixmoor
Posen
Phoenix
Harvey
Markham
Dolton
Calumet City
Burnham
South Holland
Lansing
Salt Creek
Chicago River
Calumet Sag Channel
Chicago Sanitary and Ship Canal
Little Calumet River

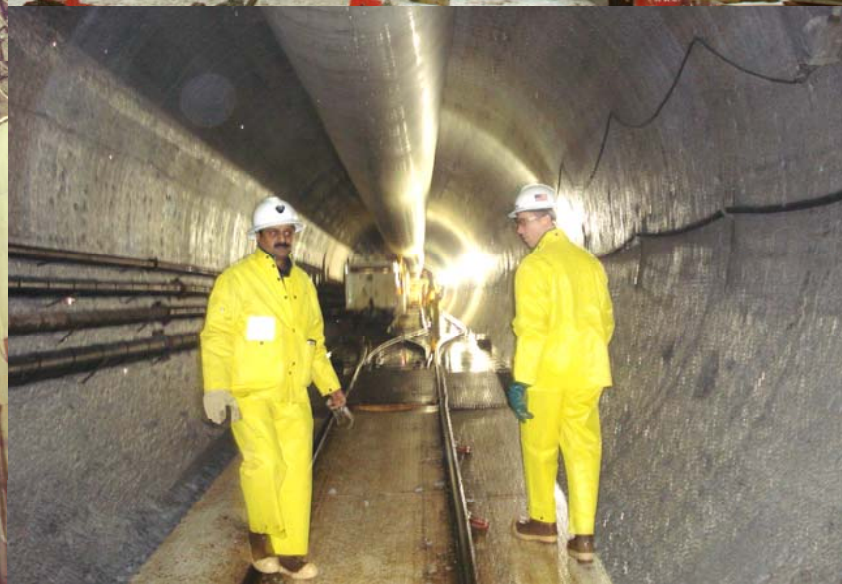
What Was Constructed?

- 109.4 Miles of Deep Tunnels
  - 10’ – 35’ in Excavated Diameter
  - 150’ – 350’ Below Ground
- 264 Dropshafts 4’ – 25’ in Diameter
- 19 Construction Shafts 25’ – 32’ in Diameter
- 3 Major Pumping Stations
- Over 600 Near-Surface Connecting and Regulating Structures




10' 9.82 (5.58)





Hydraulic Transient

Tunnel's geyser effect still puzzling

By Rob Karwath

Delores Crane swears she'll never stop her car over a manhole cover again.

About 8 a.m. on Dec. 5, as the 61-year-old Bridgeport woman was waiting at a traffic light at Jefferson and Monroe Streets on her way to work, she felt her 1981 Pontiac Bonneville rise slightly. Then the car's rear end jerked up at a 45-degree angle from the street, and foul-smelling water rushed in around her.

"Suddenly I felt like I was in a little dinghy in the middle of the ocean," Crane said.

Dazedly, Crane had stopped on the grill of a ventilation shaft for the Metropolitan Sanitary District's Deep Tunnel. That morning, the huge tunnel—filled "up to the gunnels" with runoff from heavy rains, according to the sanitary district's assistant chief engineer—blew its top and spouted a 20-foot geyser of water under Crane's car.

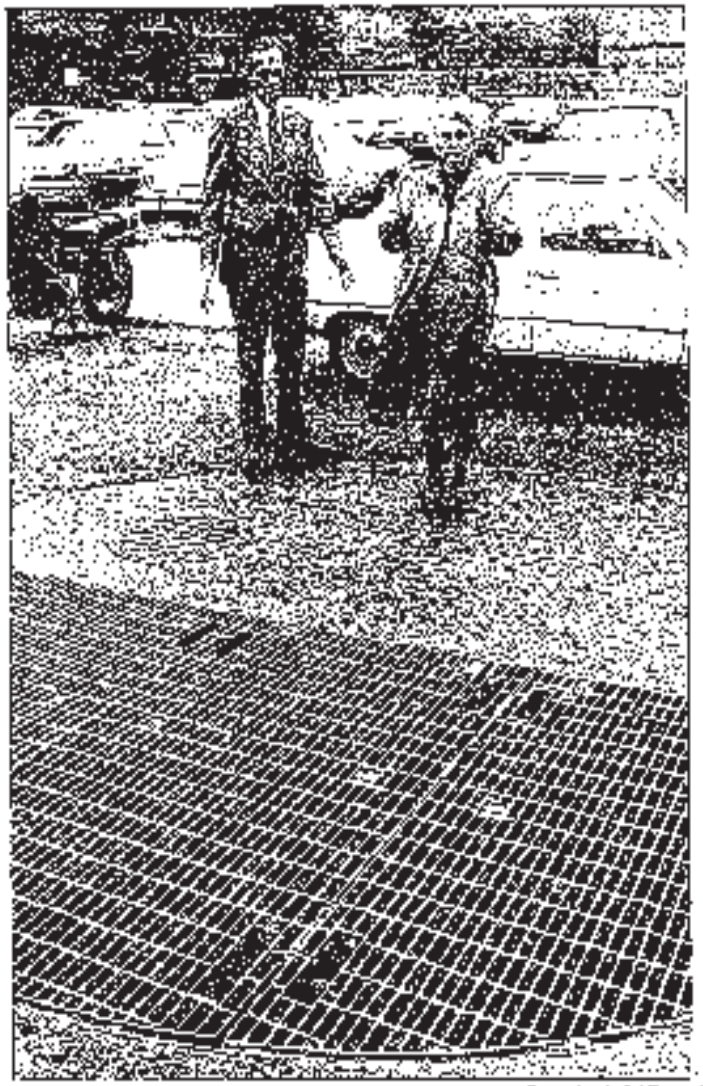
Similar spouts were reported that morning at two tunnel shafts in Evanston, said Bill Marsalek, the assistant chief engineer. No one was injured by the Evanston geysers, which spouted along the North Branch of the Chicago River at Dempster Street and at Foster Street. But the powerful surges blew off the metal grills welded over the shafts and startled commuters walking to the nearby Central elevated stop.

In the Loop, however, Crane was unlucky enough to be stopped over the four-foot-round grill when the geyser blew.

"I was only two blocks from my office," she said. "All of a sudden, I thought my car was up, then down, then up. The surge was unbelievable. I didn't know what was hitting me."

A passerby, Jeffrey Francik, a public opinion researcher at the University of Illinois at Chicago, saw what was happening and rushed to aid Crane, who couldn't move from the car. Another passerby, Jack Pehlarist, a bank systems analyst, and the mayor of Streamwood, also stopped to help.

"Her eyes were the size of grill bars," Francik said. "I ran over, opened the door and pulled her out of the car. She was so shaken up, she was like a limp dishrag."



Tribune photo by Carl Wagner

Delores Crane returns to the grating at Jefferson and Monroe where a geyser of foul water from the Deep Tunnel hoisted her car. With her is Jack Pehlarist, who helped rescue her. "The surge was unbelievable," she said.

All three of the geysers lasted less than two minutes, witnesses said. Then they disappeared into the shafts.

Marsalek said the blasts were "an extreme situation" caused by the week's heavy rains, which also flooded parts of Lake, Cook and McHenry counties. The morning the geysers spouted, sanitary district officials judged the billion-gallon capacity Deep Tunnel to be full and decided to release 57 million gallons of sewage and rainwater into Lake Michigan at Wilmette Harbor.

Marsalek said the geysers "shouldn't have happened. We're looking into why they happened." He said that the two

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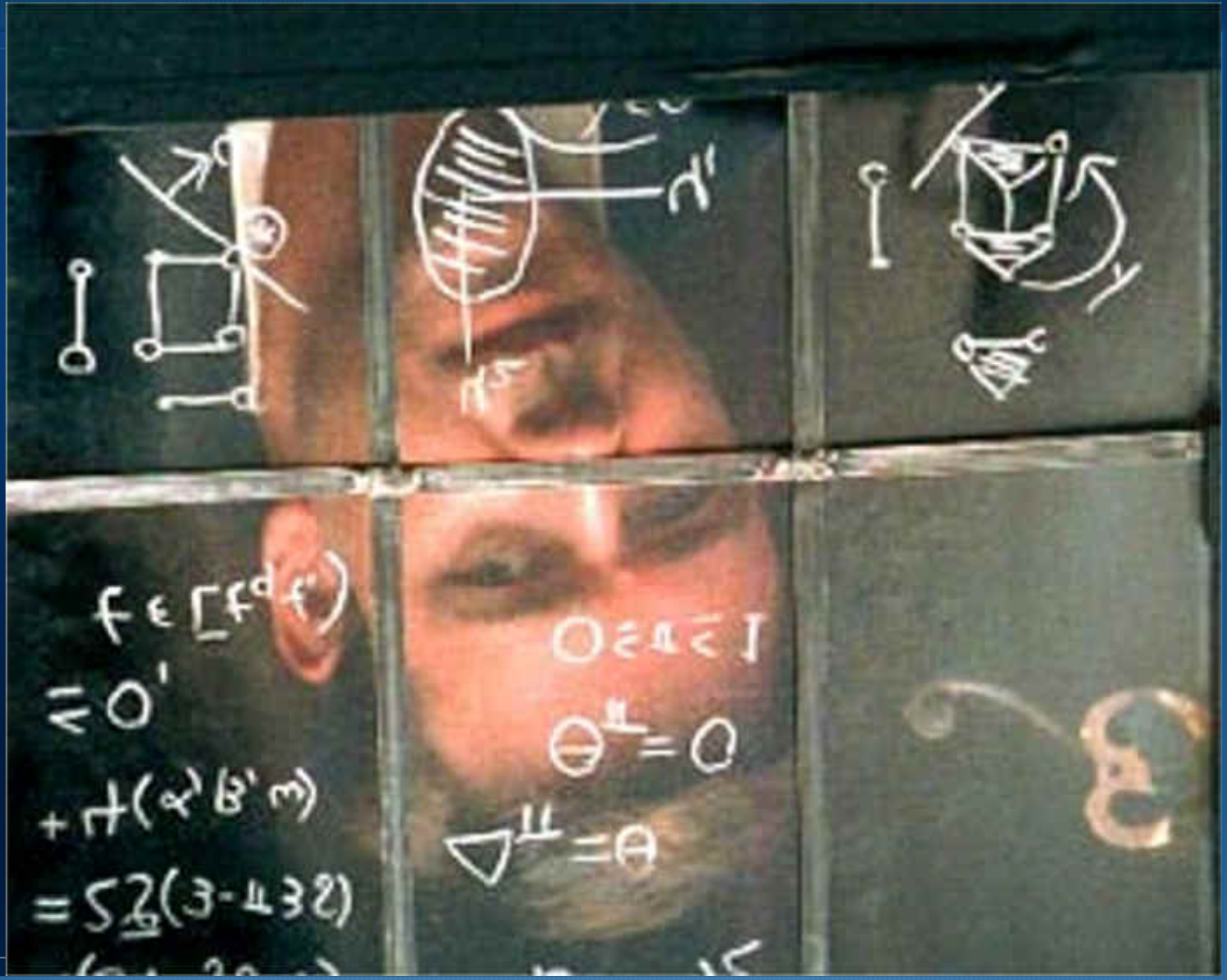


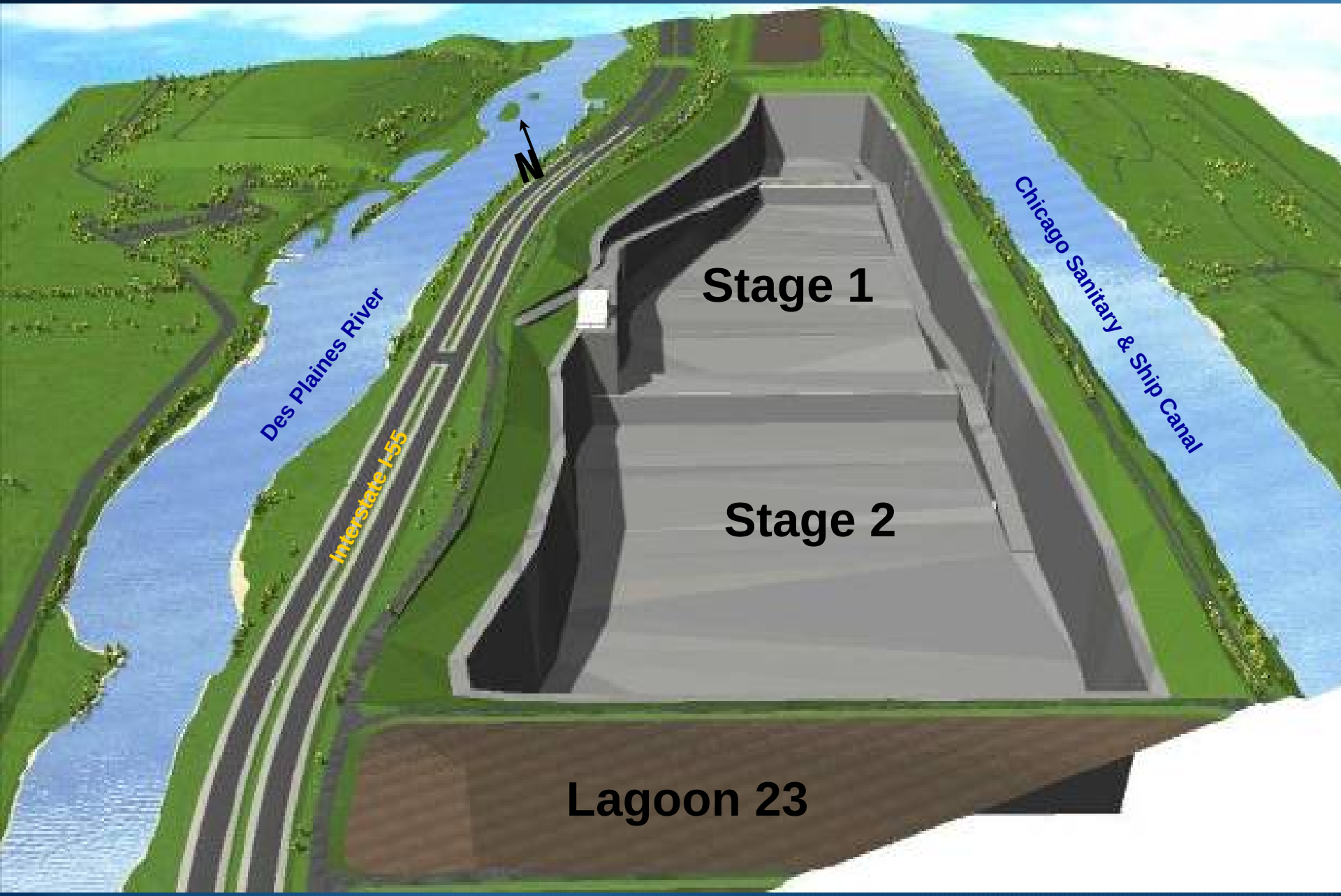
PRESENT

TARP Today

TARP Phase 2 vs. CUP

Subject	*TARP Phase 2*	*CUP*
Conveyance tunnels	22 miles	0 miles
In-line Reservoirs	2	0
Terminal Reservoir Volume	41.4 BG	12.1 BG

McCook Reservoir



McCook Reservoir
Completed Projects

Project	*Status*	*Lead Agency*
73rd Street Tunnel Relocation	Completed	District
Site Preparation & Willow Springs Berm	Completed	District
McCook Reservoir Overburden Removal (Stages 1 and 2)	Completed	District
McCook Conveyance Tunnel	Completed	District
Vulcan Mining Equipment and Motors	Completed	District
Vulcan Conveyance Systems and Maintenance Facilities	Completed	District
Overburden Groundwater Cut-Off Wall, Stages 1 and 2	Completed	COE
Distribution Tunnels	Completed (Sort of)	COE
Addition of Pumps and Motors	Completed	COE
Grout Curtain, Stage 1	Completed	COE
Rock Wall Stabilization, Stage 1a	Completed	COE

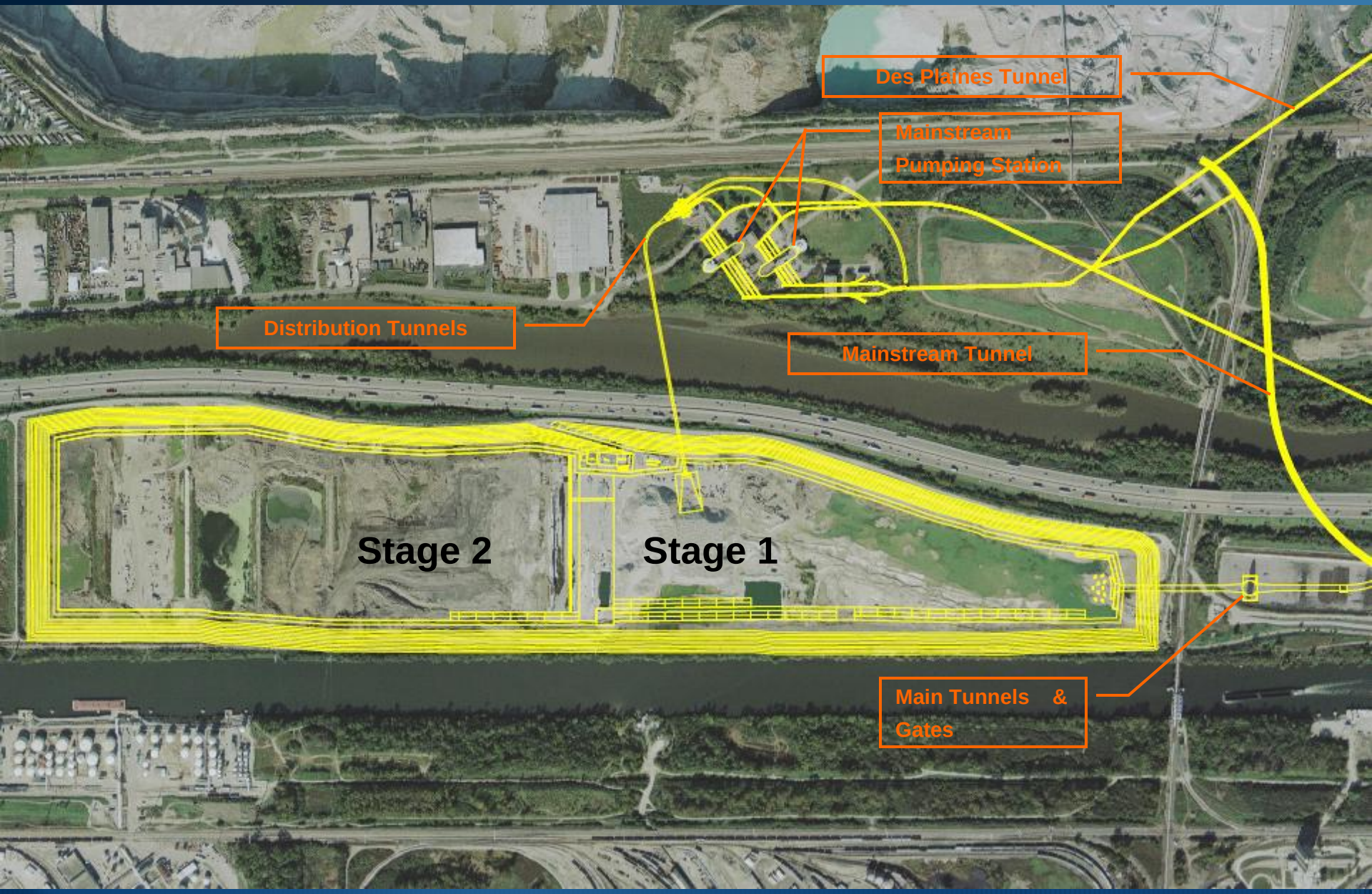
McCook Reservoir
Projects in Progress

Project	*Status*	*Lead Agency*
Rock Excavation	In Progress	District
Miscellaneous Overburden Removal	In Progress	District
Main Tunnel Access Shaft	In Progress	COE
Main Tunnel Gates	In Progress	COE
ID/IQ – Stage 1 Soil Nail Wall	In Progress	COE
Grout Curtain, Stage 2	In Progress	COE

McCook Reservoir
Future Projects

Project	*Status*	*Lead Agency*
Expanded Stage 2 Overburden Removal	Future	District
Miscellaneous Surface Features	Future	COE
Main Tunnels	Future	COE
Hydraulic Structures	Future	COE
Miscellaneous Floor Features, Stages 1 and 2	Future	COE
Rock Wall Stabilization, Stage 1b and 2	Future	COE

McCook Reservoir

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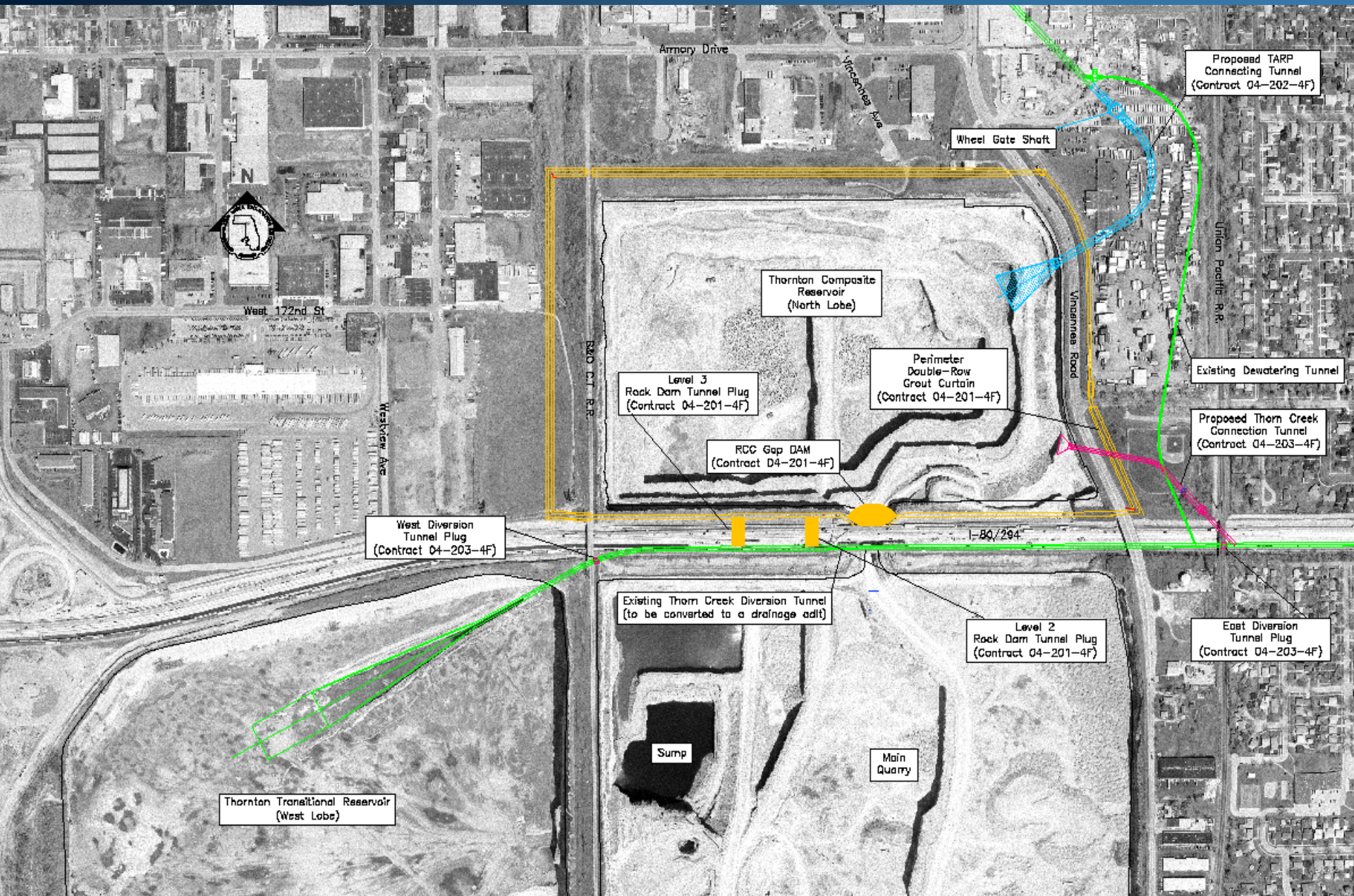
Thornton Reservoir



Thornton Reservoir
Project Status

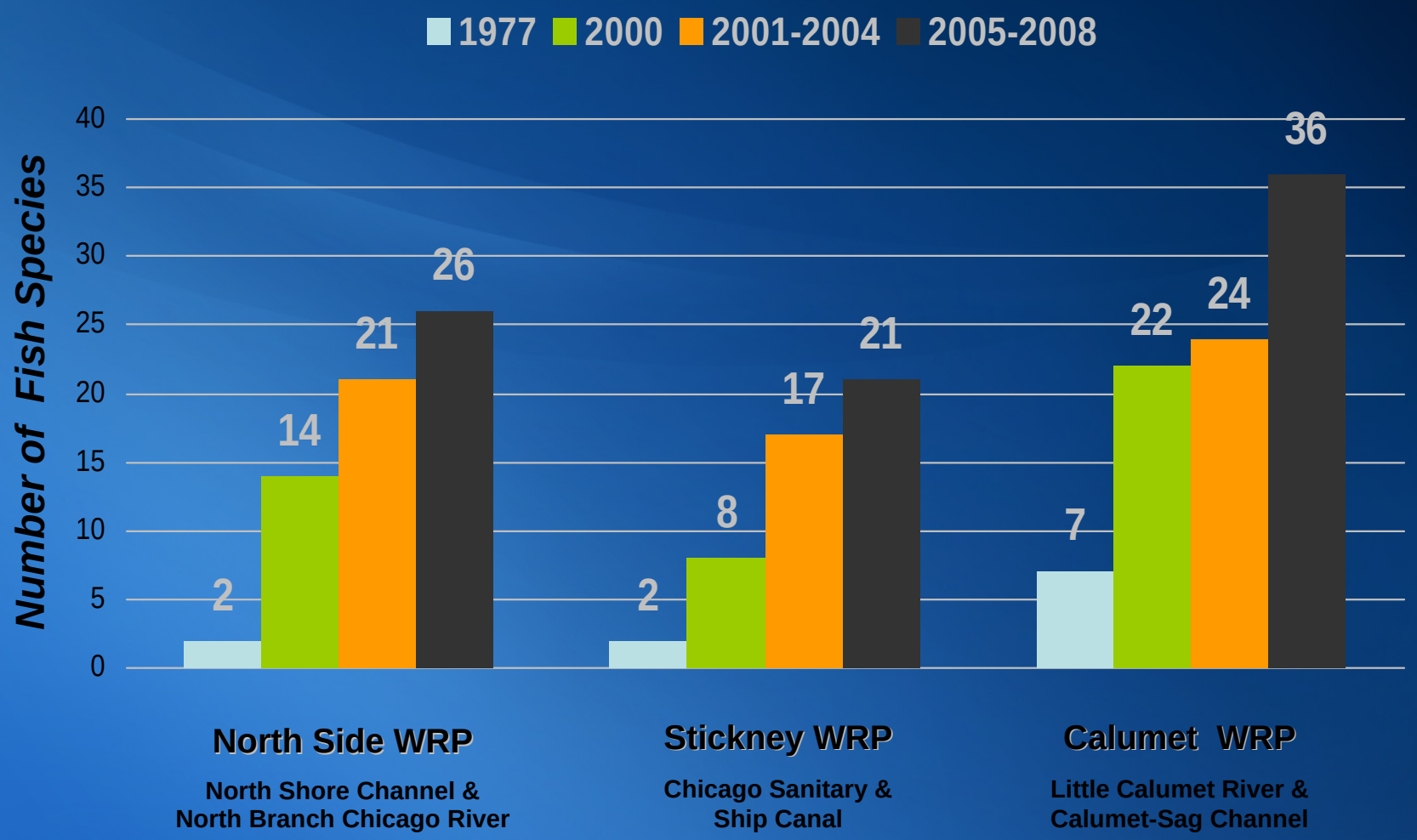
Project	*Status*	*Lead Agency*
Overburden Removal and Berm Construction	Completed	District
Vincennes Avenue Relocation	Completed	District
Thornton Transitional Reservoir	Completed	District
Rock Excavation	In Progress	District
Tollway Dam, Grout Curtain, and Quarry Plugs	In Progress	District
Connecting Tunnels and Gates	In Progress	District
Final Reservoir Preparation	Future	District
Surface Aeration	Future	District


Active Quarry
Transitional Reservoir
Tollway
Proposed Composite
Reservoir

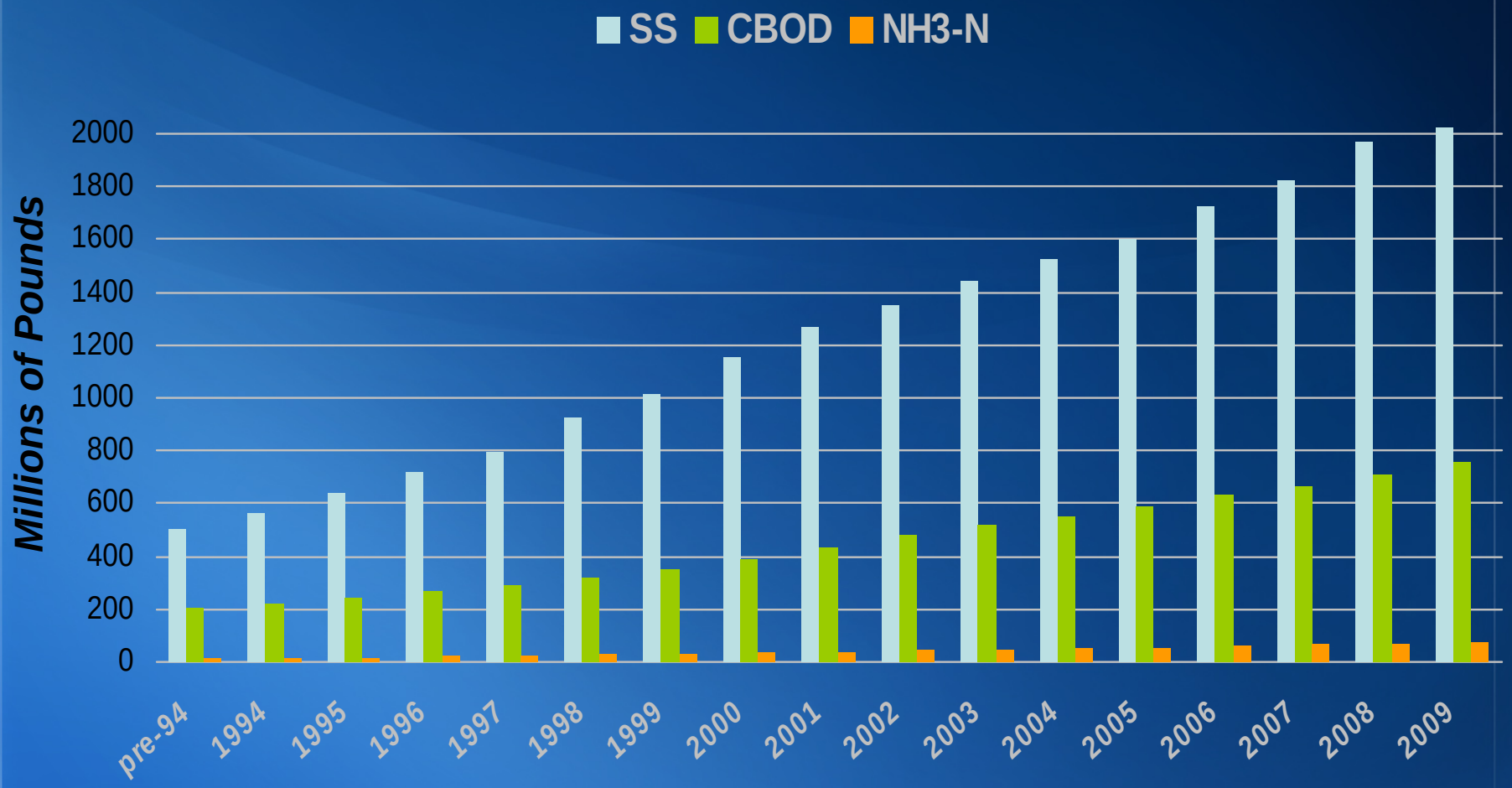
Transitional Reservoir

O’Hare CUP Reservoir

Number of Fish Species Below the Outfalls of Three MWRD Water Reclamation Plants



CSO Pollution Captured



TARP Costs

Phase 1 Tunnels……..$ 2.3 Billion

O'Hare CUP Reservoir……$ 45 Million

Thornton Reservoir……..$420 Million

McCook Reservoir……$800 Million

Total TARP……..……$3.6 Billion

FUTURE

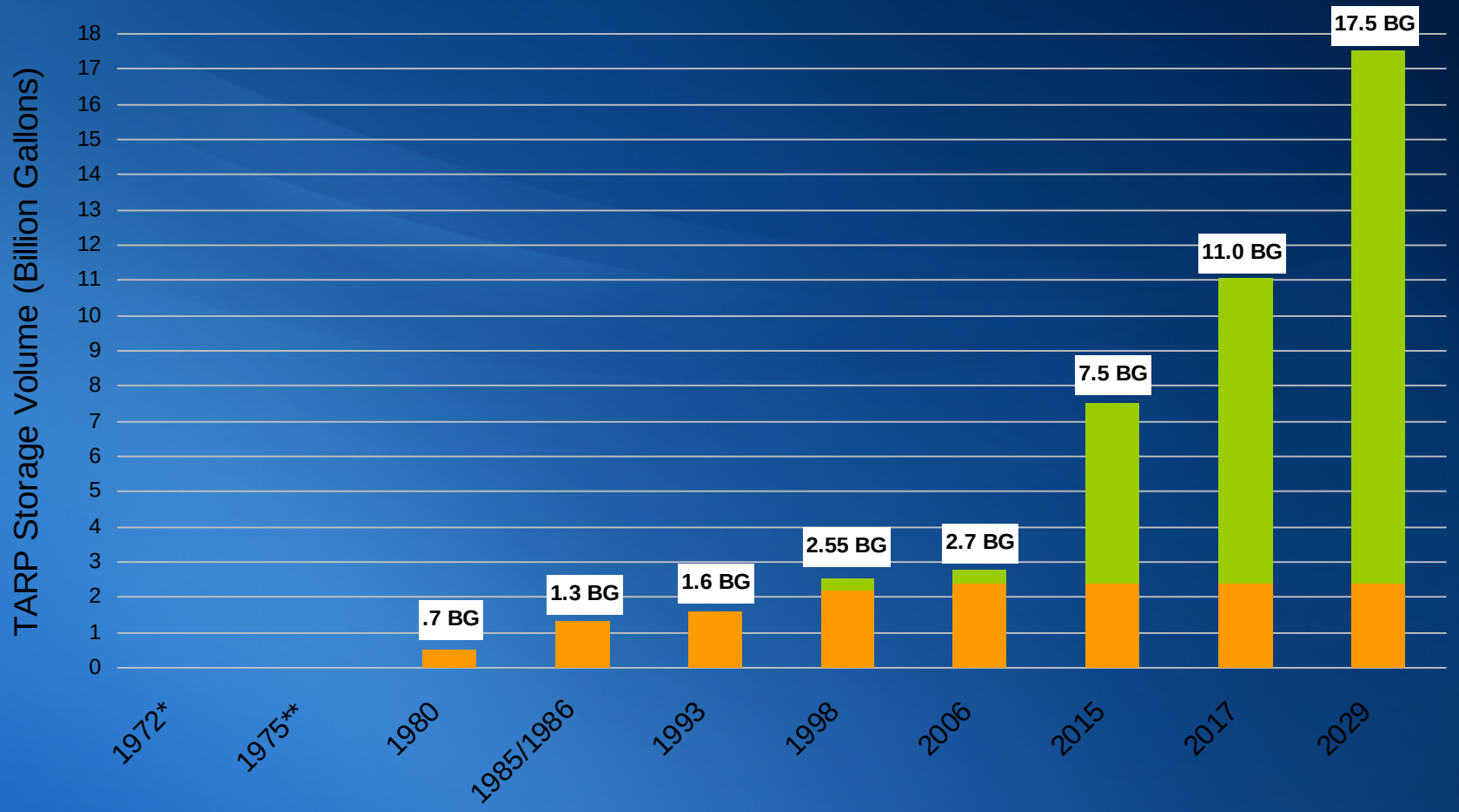
Thornton Completion - 2015

McCook Completion

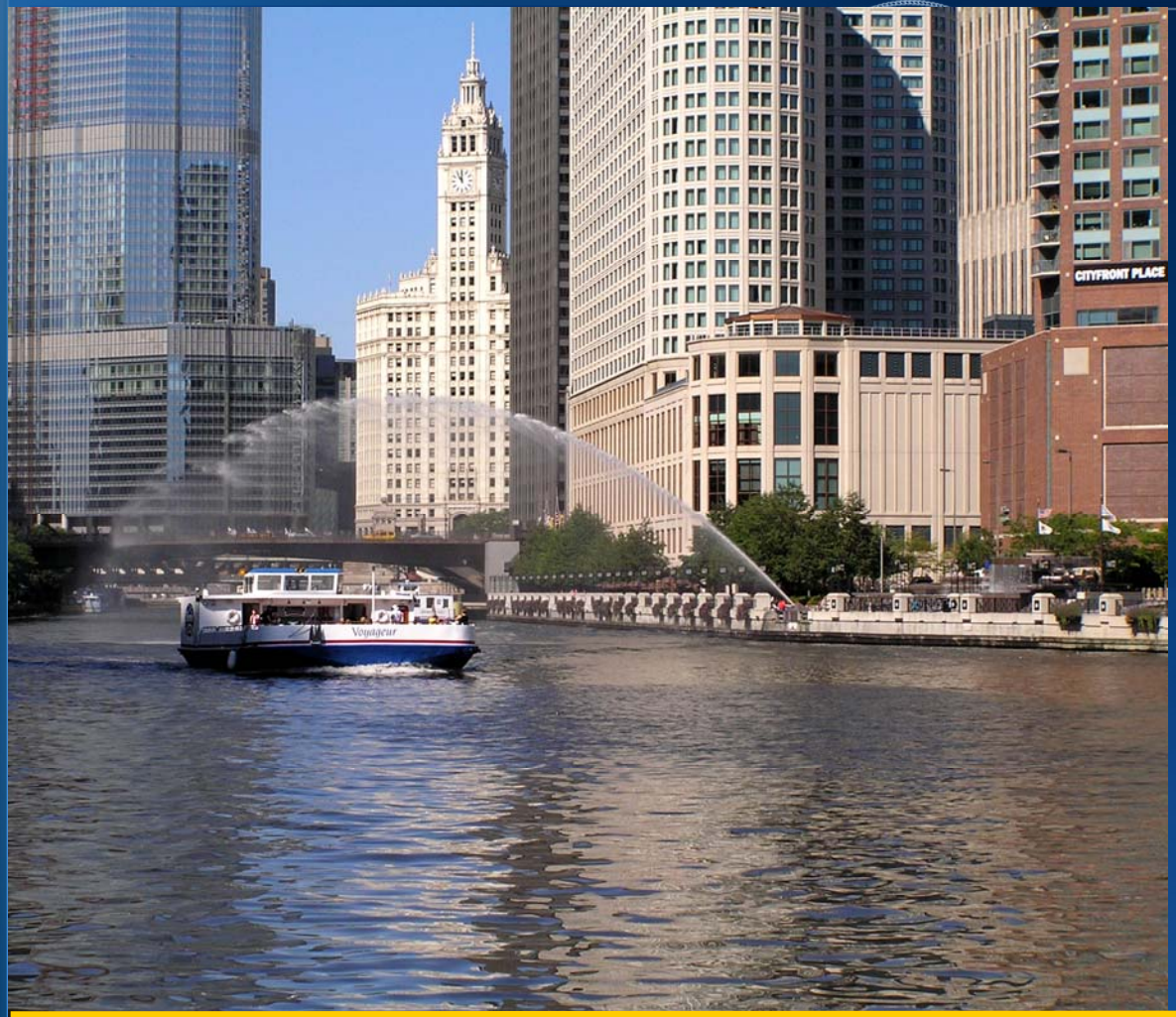
Phase 1 – 2017

Phase 2 - 2029

Planned TARP CSO Storage Volume




AFTER TARP



Questions?