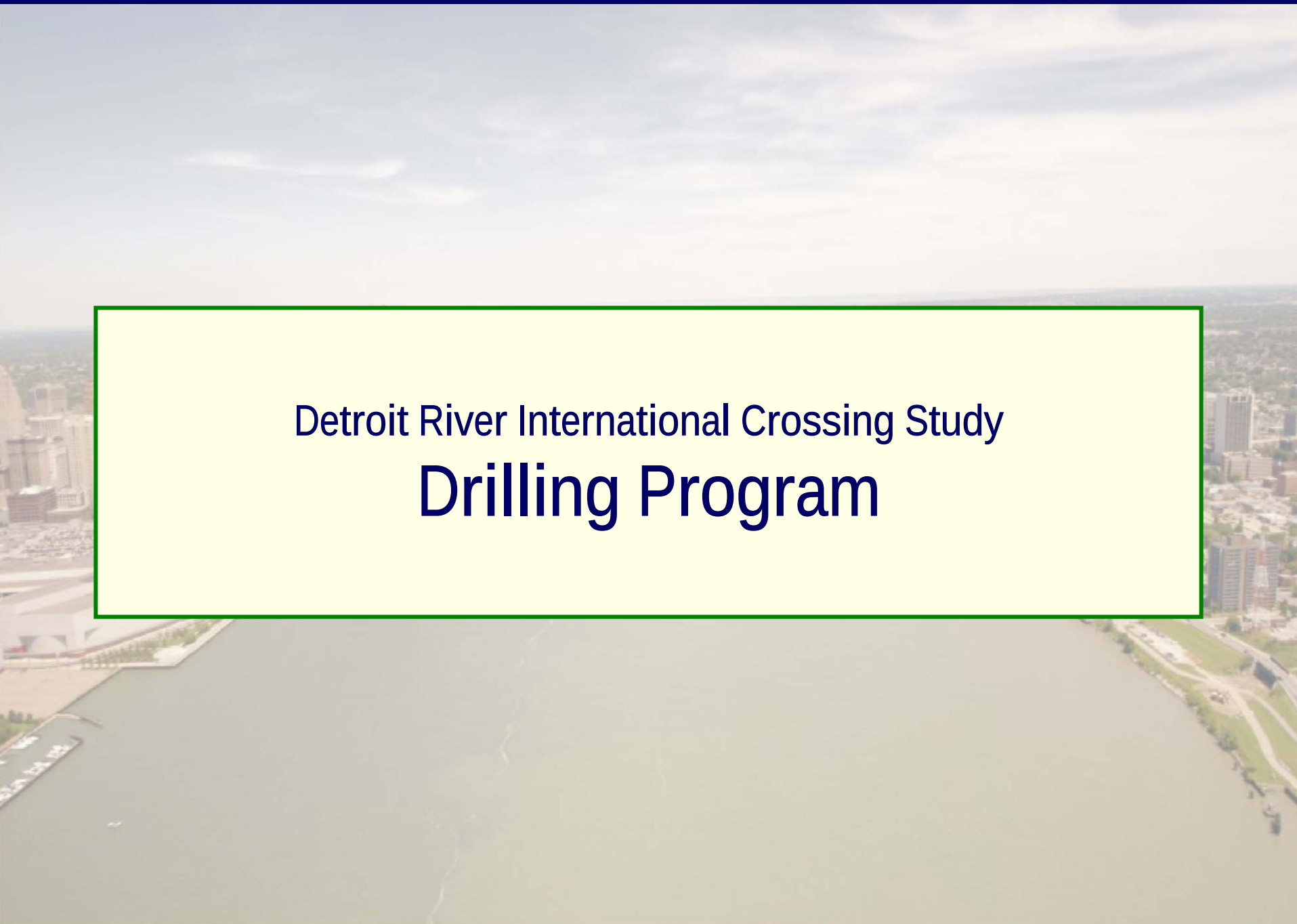
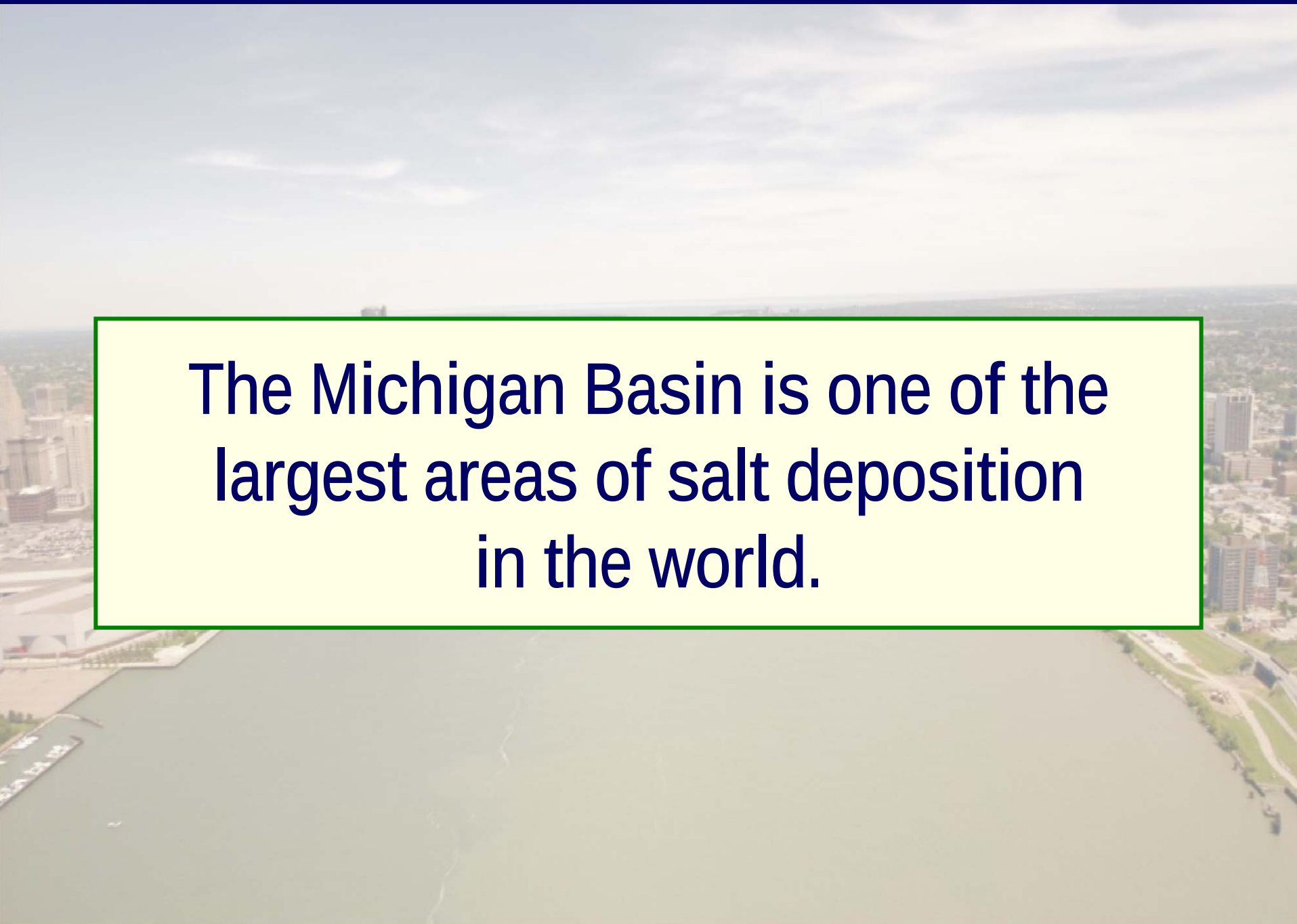


Detroit River International Crossing Study

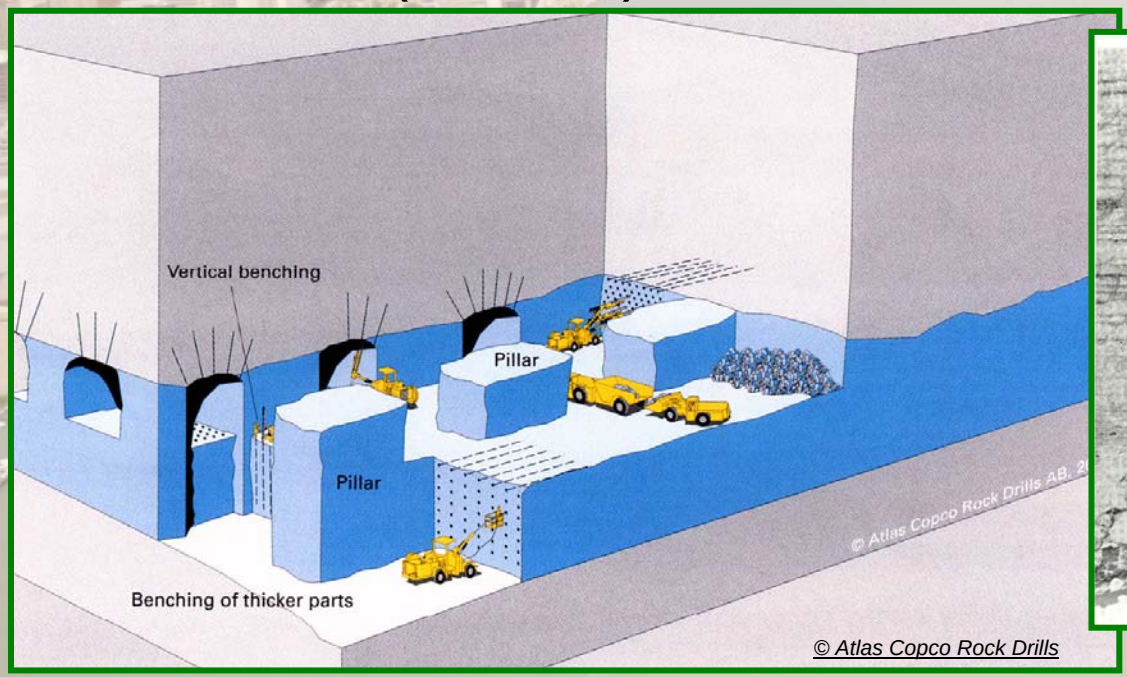
Drilling Program



The Michigan Basin is one of the largest areas of salt deposition in the world.

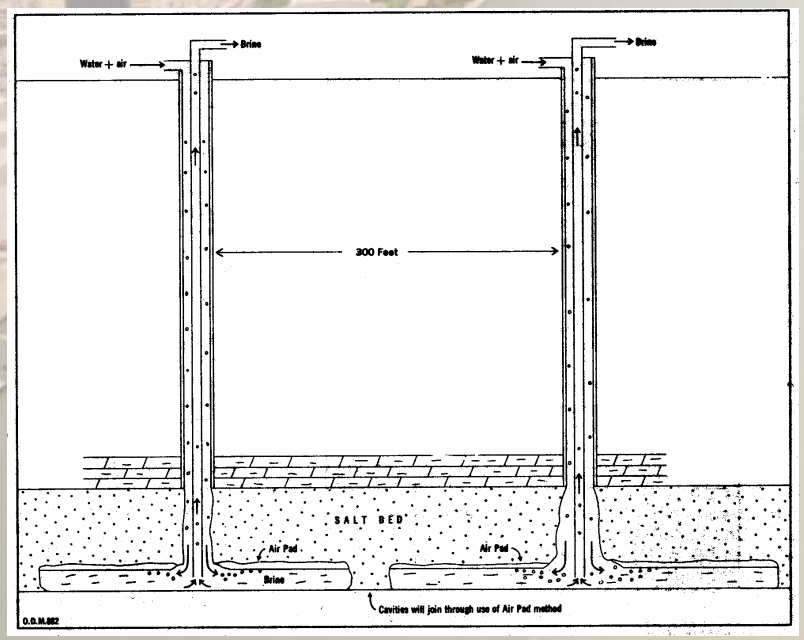
Room-and-Pillar Salt Mining

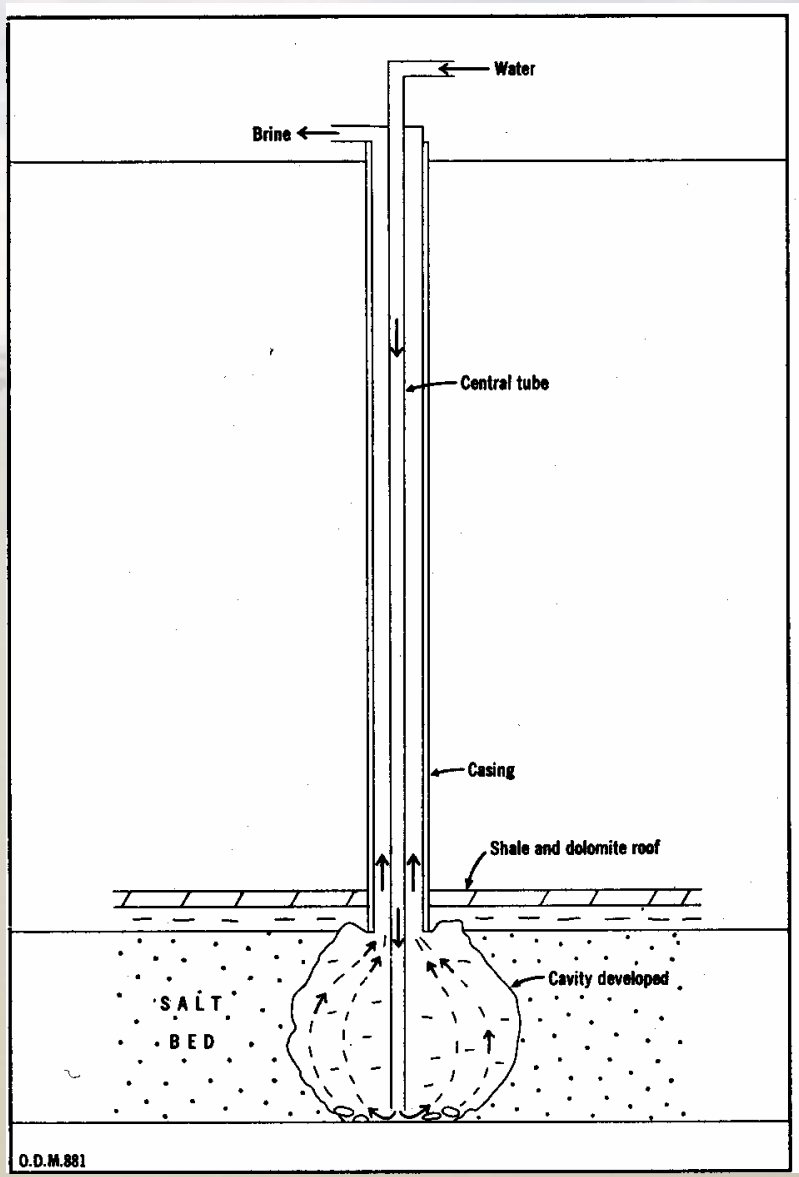
- Room-and-pillar mining for solid rock.
  - ✓Overlying rock and overburden is supported by pillars.
  - ✓Numerous buildings (like Ford's Rouge River Complex) and roads (like I-75) are built over these type mines.



© Atlas Copco Rock Drills

- Solution Salt Mining/Brine Wells
  - ✓ Brine wells date from late 1880s to 1950s.
    - Wells go down to cavities as deep as 1,200 feet below the ground surface.

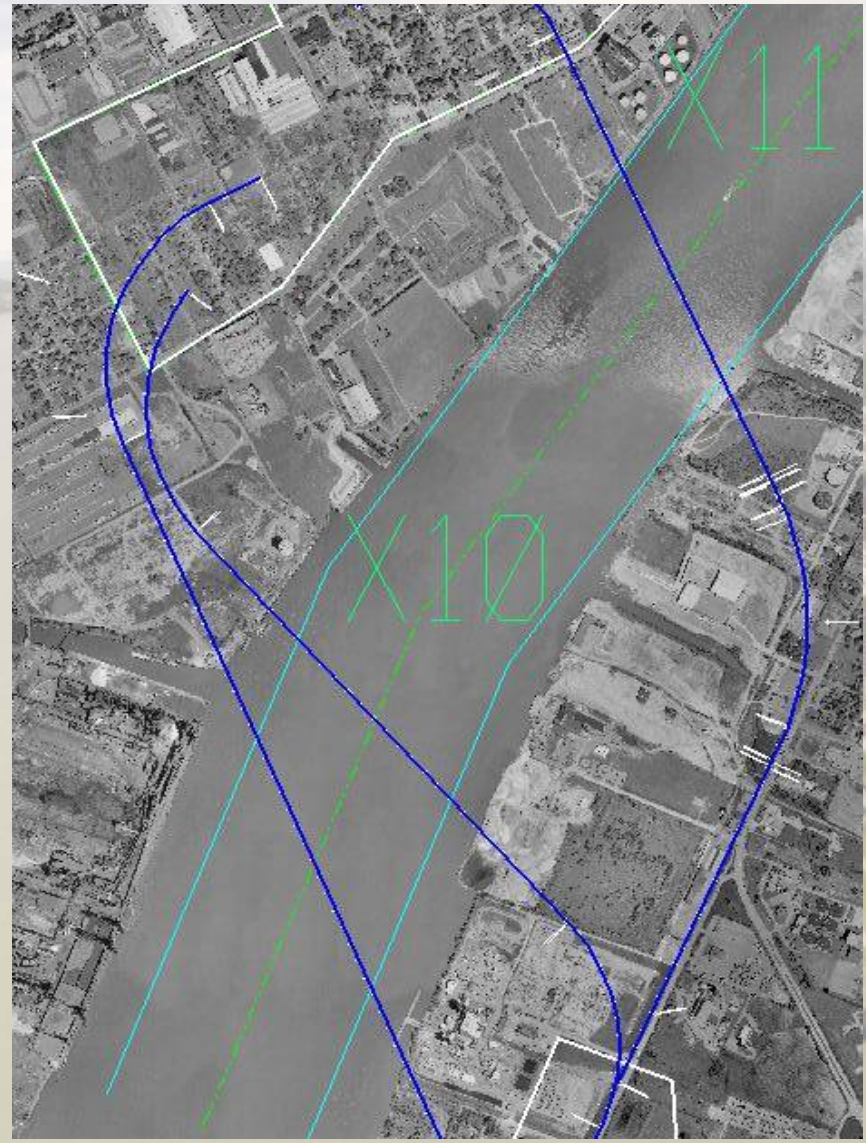




- Sinkholes have developed
  - ✓In Canada in 1954 (200 feet wide / 25 feet deep).
  - ✓ A sinkhole is evident at Hennepin Pt.

Drilling Program

- Two crossing corridors exist.

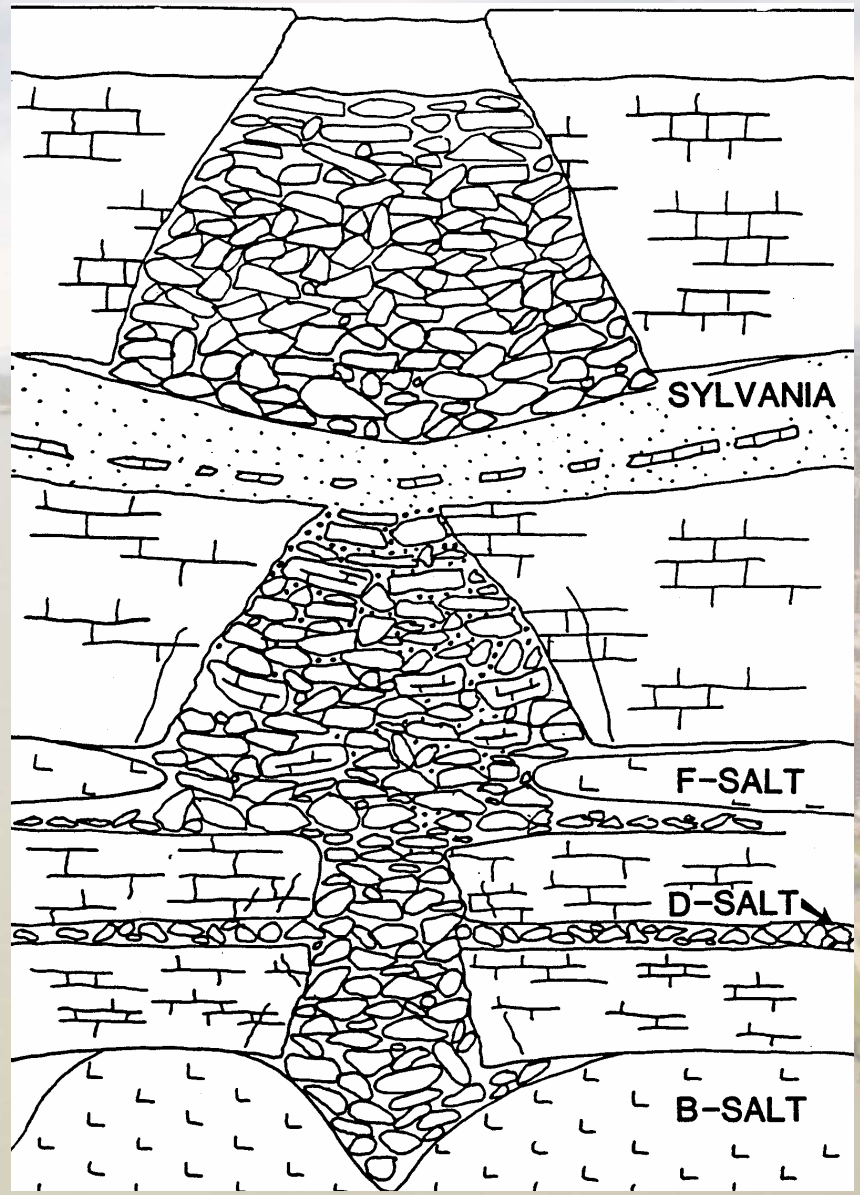


Current Situation

- Historical research indicates a number of potential brine wells are in the area of analysis for a new river crossing.
  - ✓None are in the Detroit River.

Current Situation

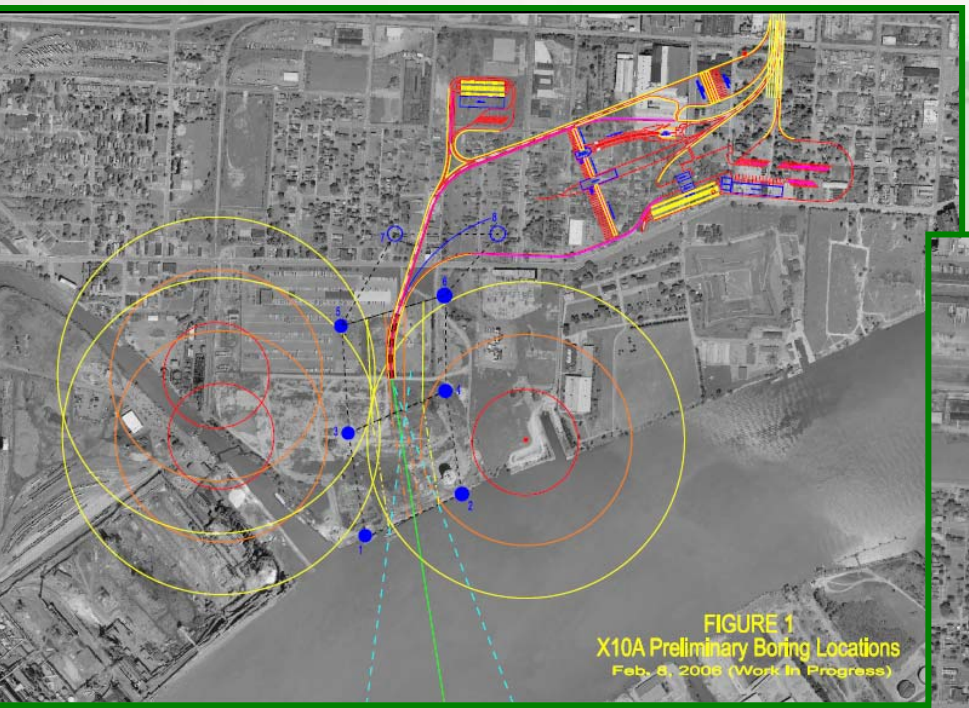
- A bridge pier/foundation must avoid the cavity cone of influence zone rising to the ground surface.
  - ✓ Weight of the layers of soil/rock above cavity can cause a sinkhole.
  - ✓ Bridge pier can accelerate the creation of sinkhole.

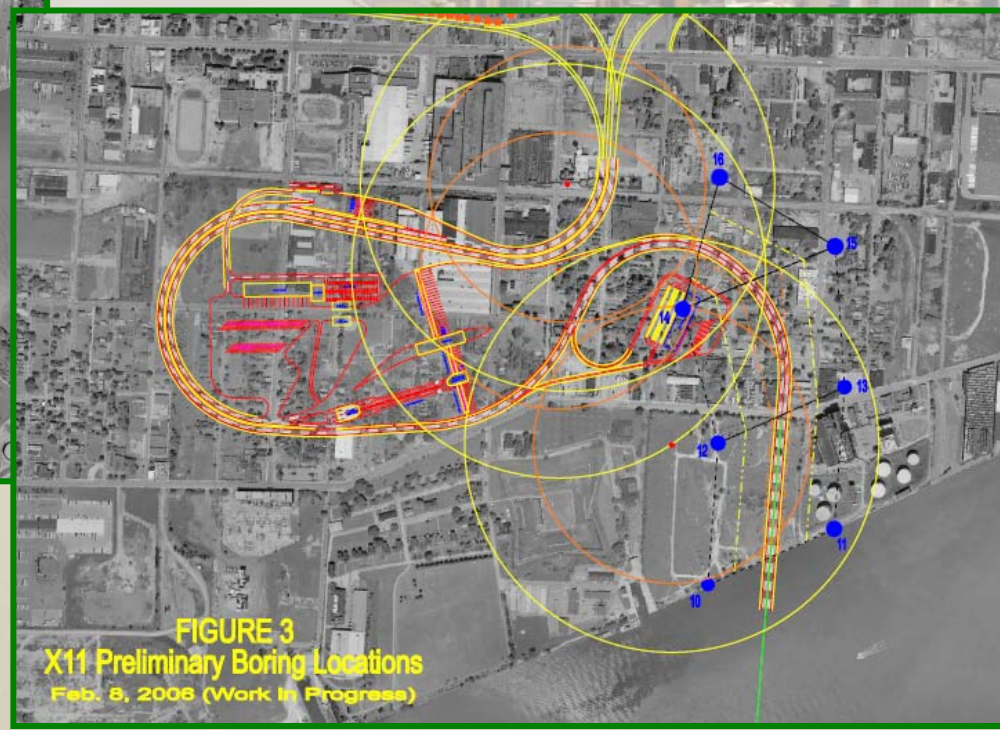


D.J. Russel, 1993

Drilling Program

- Each corridor will have 7 boreholes drilled for a total of 14.





Drilling Program (con't)

- 11 of 14 drill sites are industrial.
  - ✓ 9 of 11 are owned/controlled by City of Detroit.
- Drill rigs will be at industrial sites 30 days.

Drilling Program (con't)

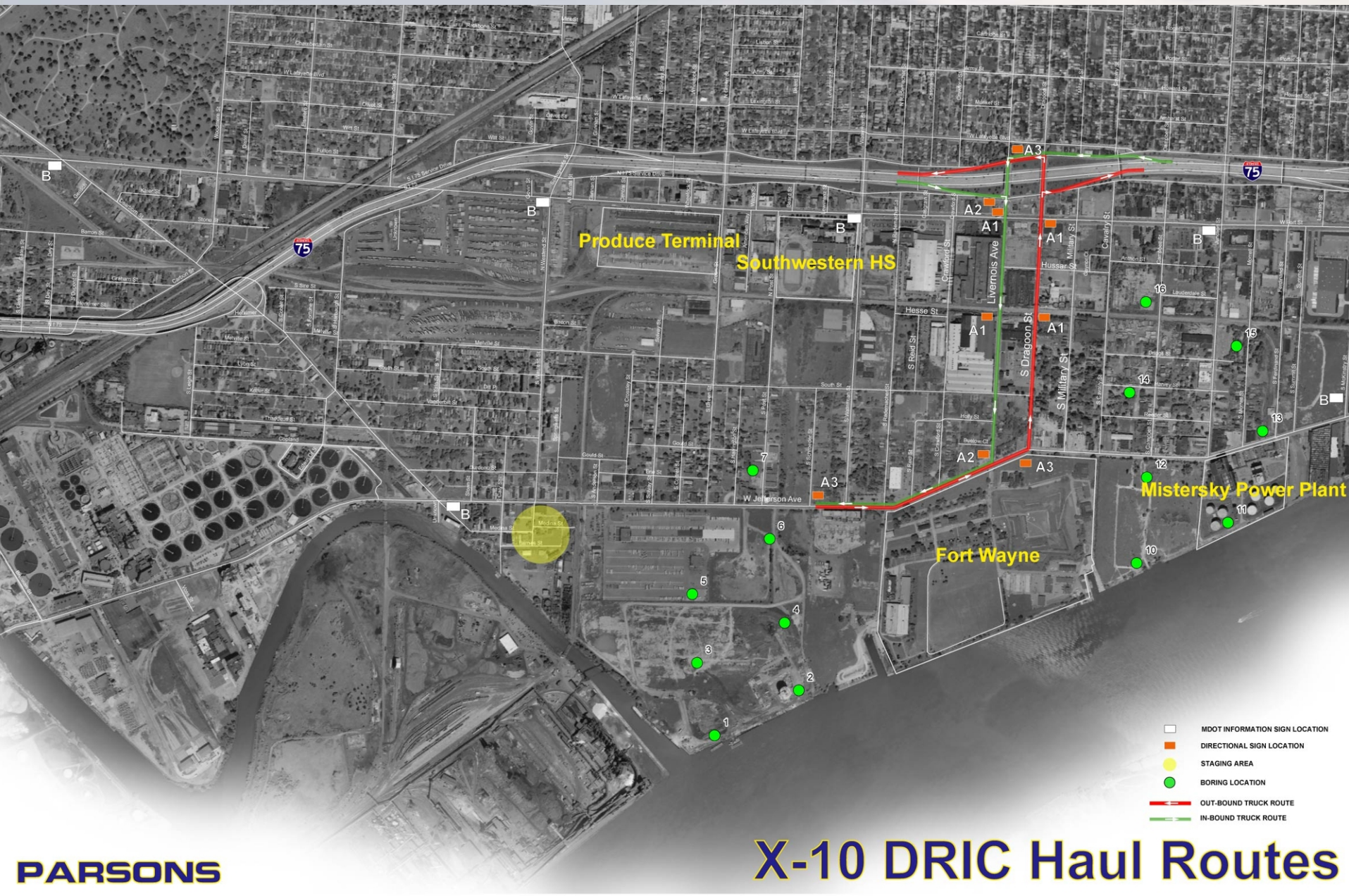
- Drill rigs at sites with residential properties within 300 feet will be there up to 15 days.
- Noise buffering will be provided to the drilling operations.

Drilling Program (con't)

- Each borehole will have a series of seismic source and receiver combinations placed in the borehole
  - ✓ High frequency seismic energy will be sent between hole pairs to create 2-D/3-D images.
  - ✓ 2-D/3-D images will detect where current cavities are located and potential zones for sinkhole development.

Drilling Program (con't)

- All drilling will be 24/7 until work is complete at each hole.
  - ✓Boreholes will be protected with flush-mount steel casing for 90 days
  - ✓Boreholes will be grouted to depth and capped after completion of testing program.
  - ✓Borehole sites will be repaired to better than conditions previous to drilling activities.
- Nuisances include noise and possible smell of "rotten eggs" (H_2S).
- Personnel will be on site.
  - ✓To manage all work including drilling operations, environmental, and safety conditions.



PARSONS

X-10 DRIC Haul Routes

Detroit River International Crossing Study

PARSONS

X-11 DRIC Haul Routes

A1

A3

A2

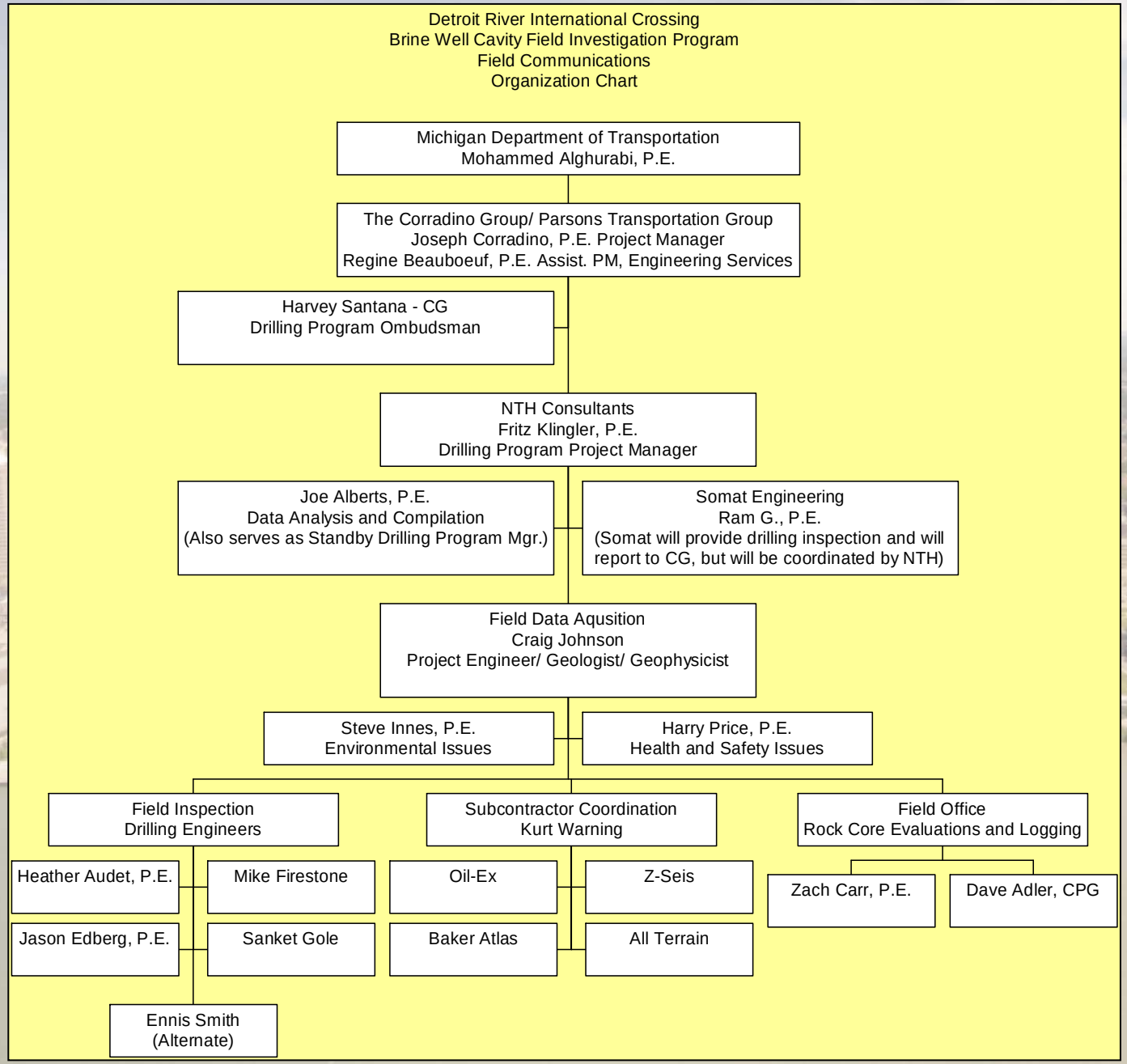
B

MDOT
is conducting
drilling for the
DETROIT RIVER
INTERNATIONAL CROSSING
For more information
call 313.xxx.xxxx

PARSONS

DRIC Haul Routes Signing

Detroit River International Crossing



Contact List for Information Regarding Field Operations:

Name	Affiliation	Phone Numbers	
Mohammed Alghurabi, P.E. Project Manager	Michigan Department of Transportation	**O: 517-373-7674** M: 517-228-9023	
Joseph Corradino, P.E. Project Manager	The Corradino Group	**O: 502-248-7900** M: 609-884-7391	
Regine Beauboeuf, P.E. Engineering Services Manager	Parsons Transportation Group	**O: 248-262-0013** M: 517-402-1584	
Fritz Klingler, P.E. Field Investigation Program Project Manager	NTH Consultants	**O: 313-237-3928** M: 313-218-9961 H: 248-649-4634	
Joseph Alberts, P.E. Data Analysis and Compilation	NTH Consultants	**O: 313-237-3911** M: 313-304-4616 H: 248-689-8330	
Craig Johnson Field Data Acquisition Project Engineer/ Geologist/ Geophysicist	NTH Consultants	O: 313-237-3917 **M: 313-350-0393** H: 517-769-2326	
Harry Price, P.E. Project Health and Safety Officer	NTH Consultants	**O: 313-237-3935** M: 313-475-0519 H: 248-477-7547	
Steve Innes, P.E. Environmental Issues	NTH Consultants	**O: 313-237-3955** M: 313-475-7219	
Ennis Smith, Drilling Engineer	NTH Consultants	O: 313-237-3934 **M: 313-350-1138** H: 313-849-4036	
Kurt Warning, Subcontractor Coordination and Site Prep	NTH Consultants	O: 313-237-5357 **M: 248-521-0536**	

Contact List for Information Regarding Field Operations:

Zachary Carr, Drilling Engineer	NTH Consultants	O: 313-237-3952 **M: 313-304-6737** H: 313-884-0004	
Sanket Gole, Drilling Engineer	NTH Consultants	O: 313-237-3933 **M: 248-240-0004**	
Heather Audet, P.E. Drilling Engineer	NTH Consultants	O: 248-324-5279 **M: 248-240-9621**	
Gnanadesikan (Ram) Ramanujam, P.E.	SOMAT Engineering	**O: 313-963-2721**	
Ed Haines	Oil-Ex	O: 231-941-4601 **M: 231-218-5877**	
Ken Moss	Baker Atlas	O: 989-773-7992 **M: 989-330-2242**	
Bruce Marion	Z-Seis	O: 713-690-5880 **M: 832-236-4517**	
Jason McCartney	Socon Well Services	O: 936-441-5801 **M:**	
Tom Parsons	All Terrain Services	O: 517-223-4290 **M: 586-246-8500**	
Harvey Santana	The Corradino Group	O: 248-799-0140 **M:**	

Questions?