ConocoPhillips Mississippi River Pipeline Release

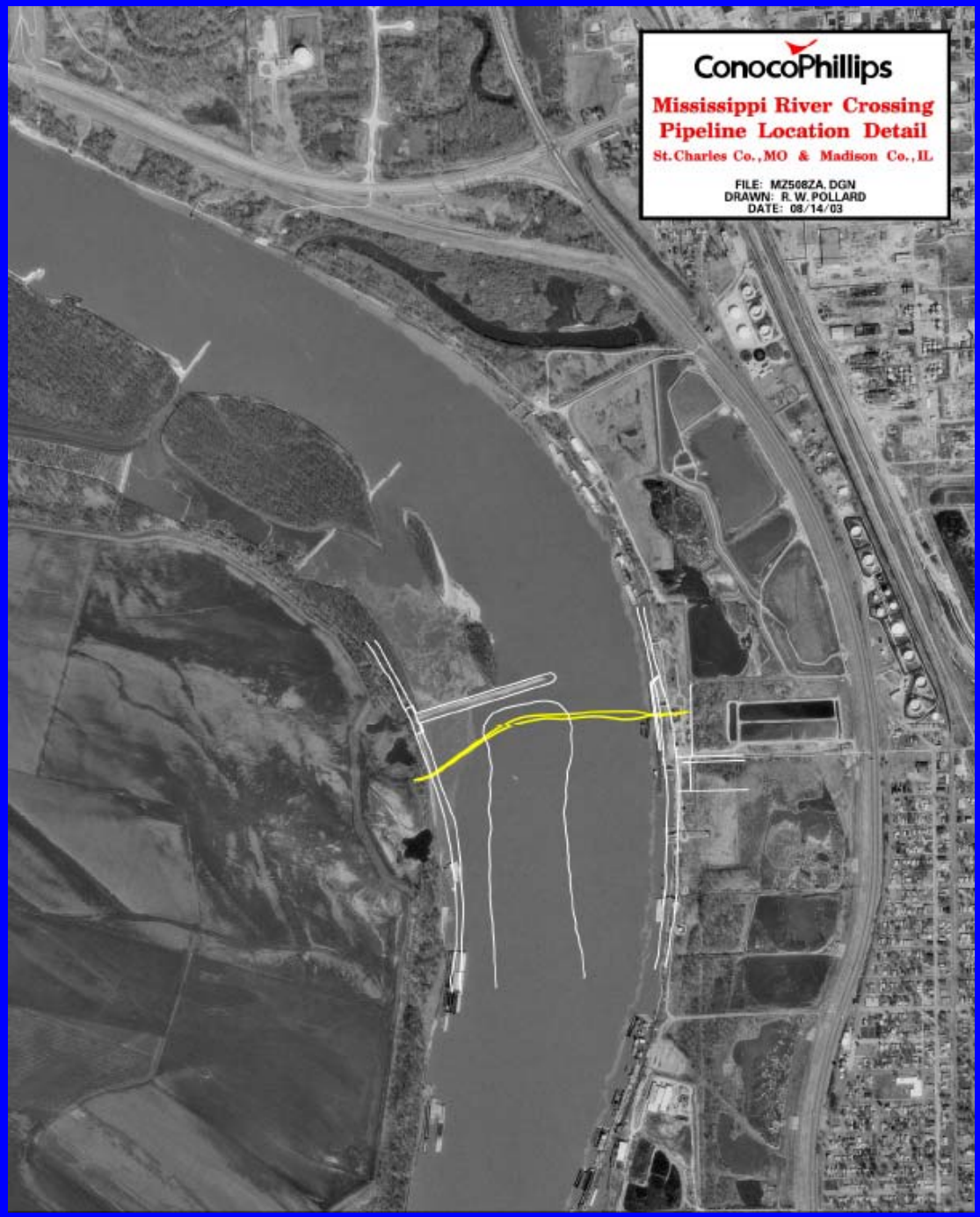
August 6 - October 3, 2003

presented by Tim Ganz, former State On-Scene Coordinator,
Missouri Department of Natural Resources

Environmental Emergency Response Section

ConocoPhillips Mississippi River Pipeline Release

- Petroleum sheen reported on August 6, 2003
- Sheen originated approximately 30 yards from the Missouri shoreline in rural St. Charles County
- Source of sheen believed to be one of two ten-inch diameter abandoned crude oil pipelines
- Source located immediately across the river from ConocoPhillips dock in Hartford, Illinois
- Leak source located behind a wing dike, calm water with little current


ConocoPhillips
Mississippi River Crossing
Pipeline Location Detail
St. Charles Co., MO & Madison Co., IL
FILE: MZ508ZA.DGN
DRAWN: R. W. POLLARD
DATE: 08/14/03

Crude Oil Sheen from South Line - 8/06/03

Crude Oil Sheen from South Line - 8/06/03

Crude Oil Sheen from South Line - 8/06/03

ConocoPhillips Mississippi River Pipeline Release

- Pipelines believed to be abandoned in the mid 1940s, although records are incomplete /non-existent
- There were no enforceable abandonement standards until 1980 – 49 CFR 195
- Pipelines are “capped” on both sides of the river.
- Emergency phase focused on mitigating the leak from the south line and containing / recovering the released petroleum.

Abandoned pipelines on Missouri side - 08/06/03

Initial containment of sheen / release - 08/07/03

Initial containment of sheen / release - 08/07/03

Containment boom - 08/08/03

Petroleum sheen at source - 08/06/03

ConocoPhillips Mississippi River Pipeline Release

- The south line was cut open on the Missouri side on 08/09/03 so material could be pumped out of the line.
- 400’ section of two inch diameter PVC pipe advanced into the south line to suck out remaining oil/water
- Oil/water mix was pumped into a steel tub at the open end of the pipeline and pumped from there into a trailer mounted vacuum tank
- Approximately 30 barrels of crude and 10 barrels of water were recovered from this operation

Cutting of south line - 08/09/03

Pumping out remaining crude/water in South Line

Portable vac tank

Beach area - 08/08/03

TOR valves installed on lines to bleed off pressure / recover product - 08/08/03

ConocoPhillips Mississippi River Pipeline Release

- Dive team hired by ConocoPhillips to find the leak and “patch” the line.
- The dive team found the leak and fastened a “sleeve clamp” to the leak area to stop the leak.
- The dive team disturbed the sediments around the south line causing a release of crude oil.

Dive team at source - 08/09/03

Absorbent boom saturated with crude oil - 08/09/03

Dive team disturbing contaminated sediments - 08/09/03

Dive team disturbing contaminated sediments - 08/09/03

Metal sleeve used to “patch” the leak on the south line

Initiating permanent abandonement of the pipelines

- Emergency phase completed
- Dive team assessed both the pipelines from “shore to shore”
- South line found to be intact
- North line found to be severed in the river channel and is missing a 100’ section near the Illinois shoreline
- Span of the pipelines is ~ 2,900’

Permanent abandonement of the pipelines

- Plan is to remove all remaining material from both lines
- Continue pumping out liquids
- Use a horizontal drill rig to insert a “pig” into the south line to “swab” the line
- Cap the severed end of the north line
- Fill both lines with concrete/drilling mud

Horizontal drill rig

Insertion of drill stem into south line

Steel sleeve used to cap the end of the north line

Eight inch diameter pig train

Push-head coming out of south line on Illinois side

Pig being pulled through the south line, Illinois side - 09/08/03

Secondary release of crude from the south line

- By September 19, 2003, the south line was ready to be filled with cement/grout
- On September 25, 2003, a cement mixture was introduced into the Illinois side of the south line using a horizontal drill rig and pumps
- Approximately 2,100’ of line was filled when a slug of crude oil was noticed in the in the water near the site of the original leak
- The oil was apparently pushed out of hole in the line due to displacement by the concrete mixture

Secondary release of crude oil - 09/25/03

Secondary release of crude oil - 09/25/03

Secondary release of crude oil - 09/25/03

Secondary release of crude from the south line

- Oil slick approximately 300 yards in length and 20’ in width
- Containment measures took approximately one hour to put in place
- Due to prevailing wind and current conditions the majority of the oil washed up on the Missouri shoreline just downstream from the leak site

Crude oil on beach - 09/25/03

Crude oil on beach - 09/25/03

Initial containment boom - 09/25/03

Initial clean up of crude oil - 09/25/03

Initial clean up of crude oil - 09/25/03

Initial clean up of crude oil - 09/25/03

Containment boom deployed around barges - 09/25/03

Permanent abandonement of the pipelines

- Drilling mud was pumped into the Missouri side of the south line to complete the filling of the line
- An additional 5 barrels of crude were recovered from this process
- Line permanently capped – abandonement complete
- Same process utilized on the north line

Oil discharging from south pipeline - 09/29/03

Oil staining on rocks - 09/29/03

South line filled with drilling mud

Drilling mud prior to mixing and inserting in the lines

Post clean-up view of beach

Abandoned Pipeline River Crossings Lessons Learned

- Very difficult to remove all liquids/material prior to abandonement
- Avoid putting pressure on the line
- Horizontal drill stem/pigging operation very successful
- Response / containment must be in place and ready during all abandonement operations
- Filling the line with concrete/ drilling mud will help to displace residual oil in line
- Dive team was invaluable in assessing the integrity of lines and performing underwater operations
- Records for abandoned pipelines are scarce to non-existent

Abandoned Pipeline Leak on the Missouri River – 12/06/00

Sheen at confluence of Missouri and Mississippi Rivers

Site Safety Concerns …

Heads up!

Slimed by a flying carp!

Questions????