



DOE-NNSA KCP STORMWATER PCB ISSUES

Stephanie Bogart, Site Office Counsel
NNSA Kansas City Site Office



History of the Kansas City Plant

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- **Plant built by Navy beginning July 4, 1942.**
- **Pratt-Whitney operated plant from early 1943 until September 2, 1945.**
- **AEC / Bendix began operations in 1949.**
- **GSA warehouse opened in western portion of building in 1963.**
- **KCP named the preferred alternative for non-nuclear component manufacturing in December 1996.**



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KCP ENVIRONMENTAL PERMITS

- Missouri State Operating Permit - MO 0004863
- Missouri Hazardous Waste Management Facility Permit – MO 9890010524. Previously administered as a Consent Order with EPA. Transitioned to MDNR authority 1999.
 - Covers cleanup activities at 43 Solid Waste Management Units (SWMUs)
 - Corrective actions implemented at 43 of 43 SWMUs
 - Groundwater Pump and Treat System operational since 1989.
 - 275+ million gallons of contaminated groundwater treated.
 - 95,000+ tons of contaminated soil removed.

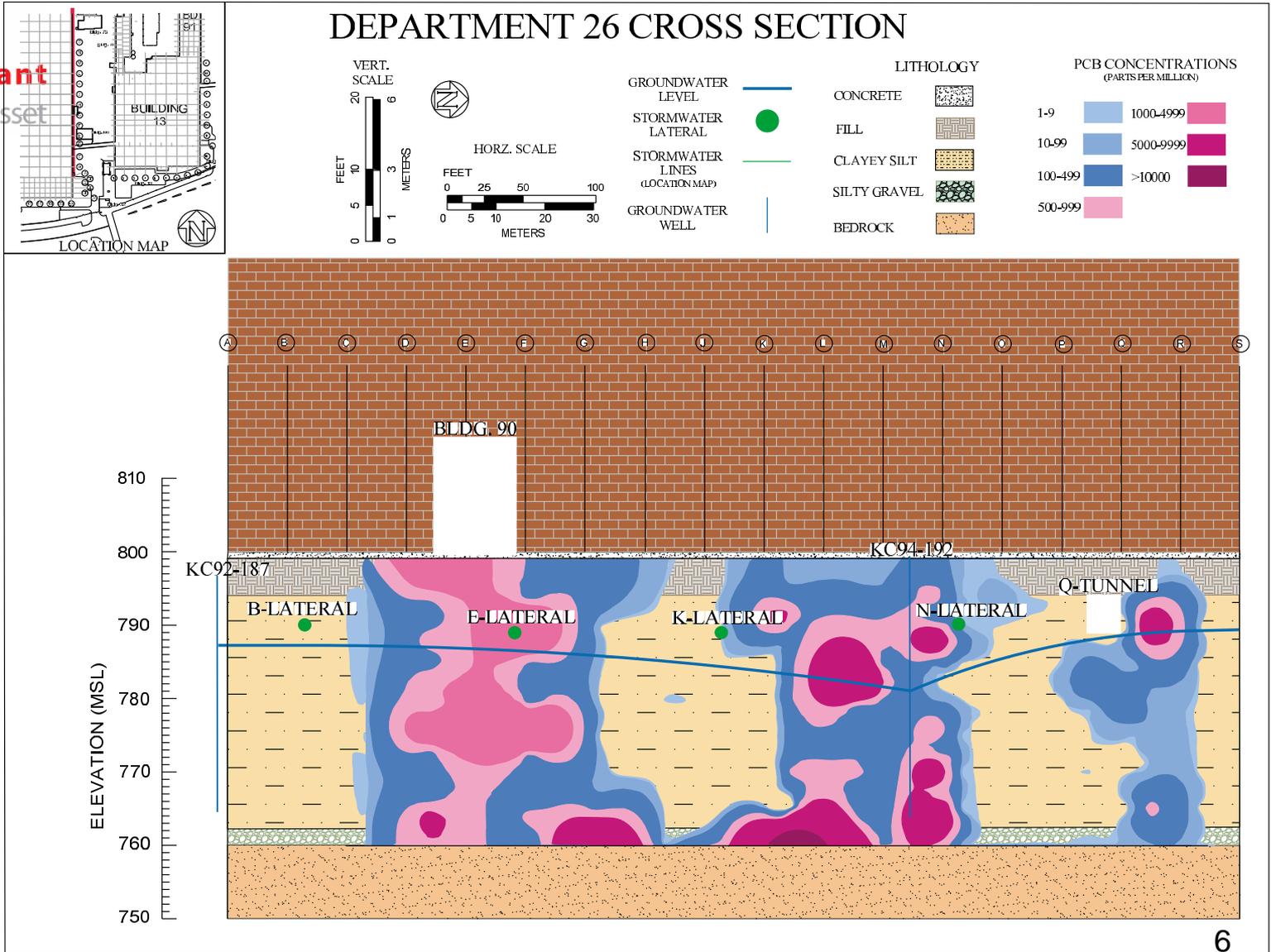
NPDES Permit and PCBs

- Therminol FR-1 (pure PCB) heat transfer fluid used in D/26 mid-1960's – 1974.
- 1974 - NPDES permit administered by EPA.
- Significant spills of D/26 heat transfer fluid in 1969 and 1971.
- 4/16/82 - MDNR NPDES permit #0004863 issued, prohibited discharge of PCBs.



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D/26 Cross Section

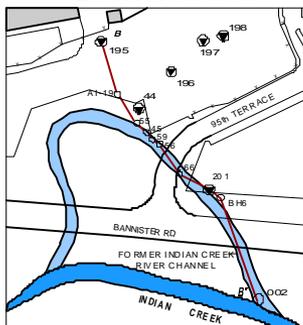


95th Terrace Site Cross Section

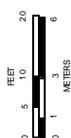


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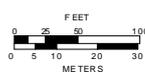
LOCATION MAP



VERT. SCALE



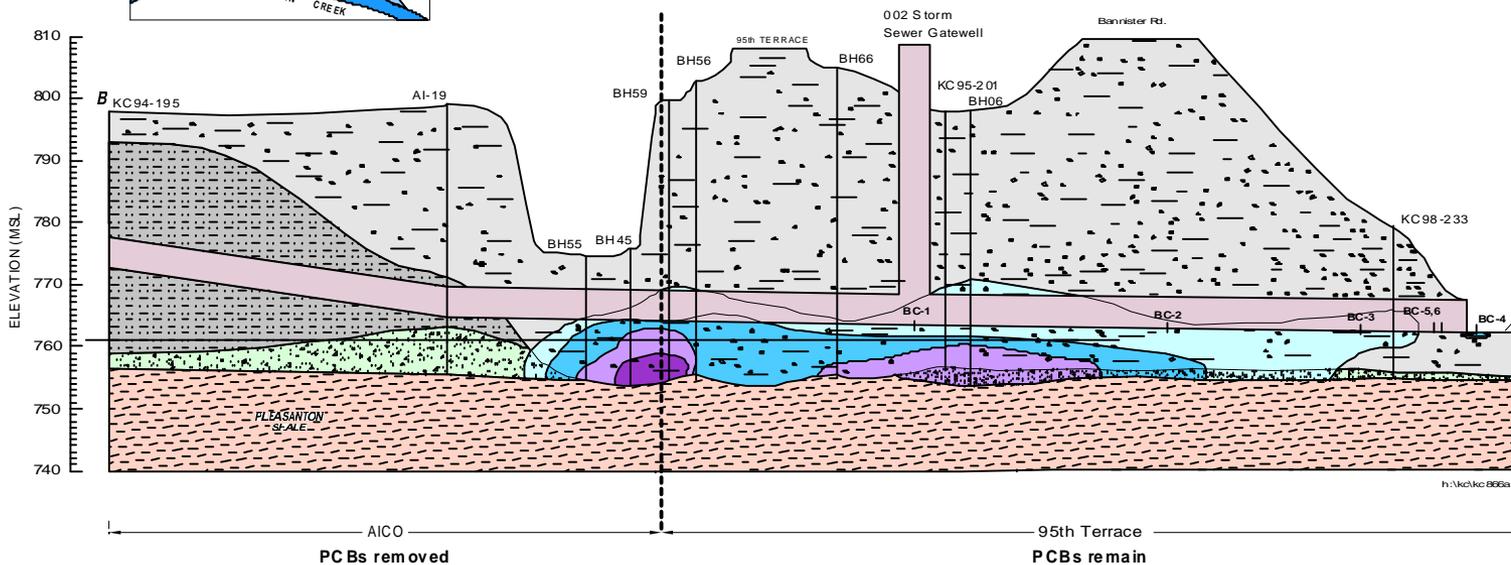
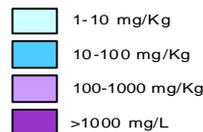
HORZ SCALE



LITHOLOGY



PCB CONTAMINATION



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Chronology

- November 1999 – Storm water permit contained interim limit of 1.0 ppb until November 2002, when final effluent level of 0.5 ppb became effective. Permit also contained a total residual chlorine (TRC) variance requiring compliance with a 0.010 mg/L discharge limit. In order to comply with the TRC limit the KCP rerouted all sources of single pass cooling water to either utilize the plant's closed loop chilled water system or discharge to the sanitary sewer. Flows in Outfall 002 went from a base flow rate (non-rain event dry weather flow) of approximately 100 gallons per minute (gpm) to 5 – 10 gpm.
- June 2002 - PCB limit recalculation request submitted to MDNR.

Chronology

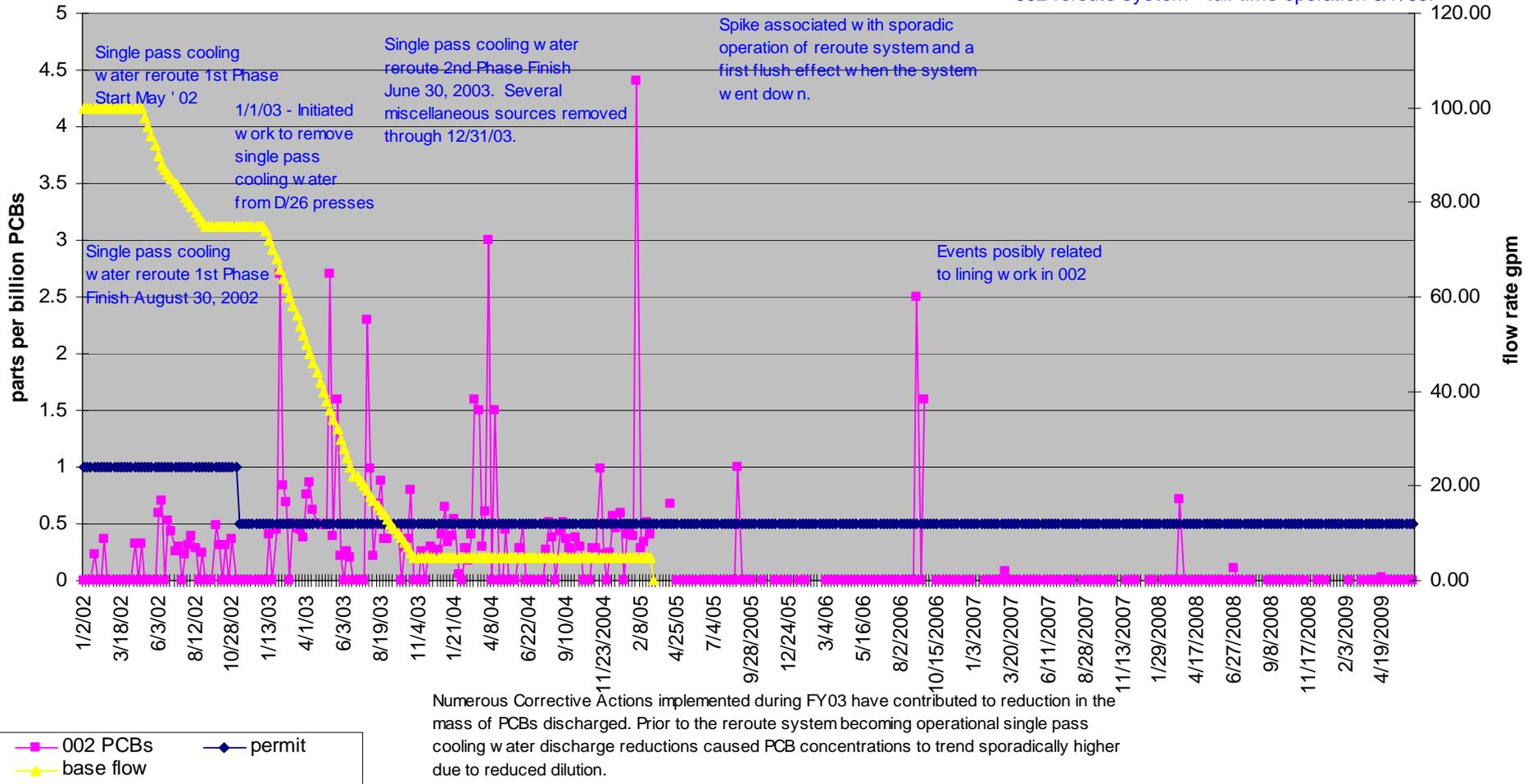
- December 2002 – Initiated Settlement Agreement discussions with MDNR.
- February 2003 – Notice of Intent to Sue given by Sierra Club.
- April 2003 – draft Consent Judgment received from MDNR. Numerous corrective actions contained in subsequent draft versions completed.
- July 2009 - MDNR public noticed draft permit with BMPs.



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Corrective Actions to Mitigate PCBs in Outfall 002

002 reroute system - full time operation 3/7/05.



Corrective Actions to Mitigate PCBs in Outfall 002

1983

- ◆ Infiltration and Inflow Study (\$51k)

1984

- ◆ Modified manholes with debris traps. Abatement Order issued 12/3/84. Cleaned Outfall 002 12/84 (\$600k).

1985

- ◆ Insituform lined K lateral .

1987

- ◆ PCB heat transfer piping and oil replaced (\$8,400k).
Cleaned outfall.

Corrective Actions to Mitigate PCBs in Outfall 002

1988

- ◆ Insituform lined B, E, N, T and W laterals and trunk line from SE bldg corner to AICO (\$570k).
- ◆ Sediment and debris plus a 320 ft section of 60 in. corrugated metal pipe and grout removed (\$850k).
- ◆ Outfall 002 Raceway remediated. 1600 tons of PCB contaminated soil removed. Clean-up level 4 mg/kg (\$600k).
- ◆ Lined manholes to prevent PCB infiltration (\$40k).

Corrective Actions to Mitigate PCBs in Outfall 002

1991

- ◆ Grout sealed box culvert joints (AICO to outfall) (~\$10k).

1993

- ◆ Abandoned Indian Creek Outfall remediated. 27,120 tons of PCB contaminated soil removed (\$10,000k).

1995

- ◆ Waste Oil Tank removed. 1,600 tons of PCB contaminated soil and 5,000 gal of oil removed (\$600k).

Corrective Actions to Mitigate PCBs in Outfall 002

1997

- ◆ D/26 Pipe Gallery remediation. 2,701 tons of PCB contaminated soil removed (\$2,000k).
- ◆ Cleaned 002 system and raceway (\$83k)

1998

- ◆ Cleaned 002 box culvert (internal labor)

1999

- ◆ Cleaned 002 system (\$53k)

2000

- ◆ Encapsulated PCB oil stain AICO to Flap Gate (\$139k)

Corrective Actions to Mitigate PCBs in Outfall 002

2001

- ◆ During FY01 \$207k was spent on source investigations and corrective actions.

Activities included:

- Conducted camera surveys of lateral lines to identify potential infiltration pathways.
- Cleaned 002 system.
- Grout injection work.

Corrective Actions to Mitigate PCBs in Outfall 002

2002

- ◆ During FY02 removed 7.63 tons of PCB contaminated sediment (~1/3 of weight drying agent) from Outfall 002 at a cost of \$60k.
- ◆ Other activities included ongoing investigations to characterize potential source areas.

Corrective Actions to Mitigate PCBs in Outfall 002

2003

- ◆ Bioaccumulation study (\$233k).
- ◆ Rerouted several D/26 roof drains (\$185.5k).
- ◆ Cleaned main trunk line of Outfall 002 (\$124.5k).
- ◆ Removed PCB contaminated tar coating on roof structures (\$230k).
- ◆ Inspected and sealed Outfall 002 lateral lines (\$37k).
- ◆ Grout injected several infiltration points and repaired epoxy coating in box culvert (\$157k).
- ◆ Installed / evaluated passive filtration system.

Corrective Actions to Mitigate PCBs in Outfall 002

2004

- ◆ Install Access Restriction at Outfall 002. Other activities included ongoing investigations to characterize potential source areas (\$88.5k).
- ◆ Clean Outfall 002 main trunk line (\$69.5k).
- ◆ Reroute Outfall 002 base flow (\$107k).
- ◆ Additional SPMD investigations (\$19k).

Corrective Actions to Mitigate PCBs in Outfall 002

2005

- ◆ Annual 002 inspection completed - cleaning not required.
- ◆ Grout injected seeps in box culvert (\$119k).
- ◆ Additional SPMD investigations conducted (\$70k).
- ◆ Bioaccumulation Study (\$182k).



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Corrective Actions to Mitigate PCBs in Outfall 002

2006

- ◆ Annual 002 inspection completed - cleaning not required.
- ◆ Lined ~1600 feet of the Outfall 002 main trunk line (\$1,030k).
- ◆ Exterior surface drainage improvements (\$56.5k)

2007

- ◆ Annual 002 inspection completed - cleaning not required.

2008

- ◆ Bioaccumulation Study (\$295k)
- ◆ Grout inject box culvert floor joints (\$107k)

TOTAL CORRECTIVE ACTION COST TO DATE \$18,973.5k*

*Does not include \$8,400k to replace D/26 PCB heat transfer system or cost of RFI investigations.

Part B Permit Driven Actions

- 95th Terr CMS - approved
 - Indian Creek sediment sampling. Trigger for additional action.
 - Bioaccumulation Studies (2005, 2008, and 2013).
 - Piping inspection and maintenance.
 - Effluent sampling.
 - O & M of Outfall 002 reroute system
 - Recalculation of Hazard Index
 - Notification Signs
 - Access Restriction
 - Periodic review of emerging remediation technologies

Current Status

- KCP's NPDES Permit expired November 2004.
- State regs automatically continue permit with submittal of a renewal application.
- Consent Judgment negotiations ongoing with MDNR since 2001.
 - Several draft versions have been reviewed.
 - KCP has completed action items in each draft with the exception of the fate and transport study.
- Draft permit public noticed July 17, 2009.

BMP Permitting Approach

- Draft permit public noticed on July 17th proposed the use of BMPs to regulate the discharge of PCBs.
 - Specific BMPs were not identified. The SWPPP is to contain a listing of BMPs to control the discharge of contaminants.
 - Actions to be completed in the event the PCB discharge concentration exceeds 0.5 µg/L (the draft permit incorrectly references unit as mg/L) are listed:
 - Review SWPPP
 - Document review
 - Implement necessary corrective actions
 - Notify MDNR
 - 30 day progress report detailing corrective actions



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BMP Permitting Approach

Withdrawn due to EPA concerns.

BMP Permitting Approach

- Section 502 of the CWA defines effluent limitations to mean any restriction on quantities, rates, and concentrations of constituents discharged from point sources.
- 40 CFR 122.44(k)(3) allows a BMP permitting approach where effluent limits are infeasible (i.e., is it infeasible to derive the limit).
 - Per EPA guidance numeric limitations for storm water permits can be difficult to develop because of the intermittent and variable nature of stormwater discharges and their effect on receiving waters.
 - Further complicating the ability to derive a numeric PCB limit is the water quality standard of 0.045 ng/L and the analytical detection limit of 100 ng/L or 0.1 µg/L.

Antibacksliding Issues

- EPA has consistently interpreted Section 402(o)(1) of the CWA to allow relaxation of WQBELs if either the requirements of Section 402(o)(2) or section 303(d)(4) are met.

Antibacksliding Issues

- Section 402(o)(1), subject to exceptions, prohibits the relaxation of effluent limitations for two situations - technology based and WQS based limitations.
- Section 402(o)(2) outlines exceptions to the prohibition of relaxed effluent limits in subsequent permits (see also 40 CFR 122.44(l)).
 1. Substantial alterations to the permitted facility
 2. New information
 3. Technical mistakes with permit issuance
 4. Good cause exists due to events beyond permittee's control
 5. Permit has been modified
 6. Required treatment systems properly operated and maintained and permit limitations still not achieved.

Antibacksliding Issues

- Antibacksliding exception criteria applicable to the KCP:
 1. ***Substantial alterations have been made to the facility.*** As required by the current permit all single pass cooling water discharges were removed from the storm sewer system. This significantly altered the storm water flow regime at the KCP.
 6. ***Permittee has installed and properly operated and maintained treatment facilities.*** The KCP has completed corrective actions required by both the MSOP and the Part B Post Closure Permit. Further reductions are technically impractical.

Antibacksliding Issues

- Section 402(o)(3) prohibits the relaxation of effluent limitations in all cases if the revised limit would result in violation of an applicable effluent guideline or WQS.
 - Missouri has established a fish tissue threshold level of 0.75mg/kg PCBs to determine compliance with the WQS protective of the fish consumption beneficial use category.
- Based on the above criteria, Indian Creek and the Blue River comply with the established WQS for PCBs.

Antibacksliding Issues

Assigning a numeric PCB limit will not be as effective a permitting tool as requiring implementation of BMPs. BMPs are appropriately applied where calculation of a numeric limit is infeasible. Therefore, implementation of BMPs as a means of limiting PCBs in the discharge is not backsliding.

Summary

- The KCP has exhausted practical means of remediating PCB source areas.
- Likewise, efforts to prevent PCB migration into stormwater discharges have been exhausted.
- PCB discharges have been significantly reduced.
- PCB levels in fish do not contain unsafe levels of PCBs and PCBs are below health screening values.
- BMP Permitting approach does not constitute backsliding.