Department of the Environment

MS4 PCB TMDL Implementation Guidance

Options for Developing Montgomery County's Implementation Strategy

General Strategies

- MDE is not proposing to implement the following strategies to achieve the required reductions in PCB loadings. These strategies would be highly inefficient at achieving the reduction goals.
  - Point source effluent limitations
  - Implementing additional urban stormwater BMPs (as an initial approach to reducing PCB loads)
- Proposed strategies
  - Accounting for reductions in PCB loadings
    - Sediment load reductions
      - Assumes PCB source is diffuse across the urban landscape
      - PCBs have a high affinity for binding to sediments
      - BMPs implemented to meet Chesapeake Bay sediment reduction goals will therefore reduce PCB loadings as well
    - Stormwater pond maintenance
      - Analysis of PCB concentrations in dredged sediments
      - If dredged sediments taken to landfill, can take credit for removing from the system
      - Load reduced = (Amt. of sediment removed) x (Avg. PCB concentration)
  - Source tracking
    - Several options are possible
    - Could pull aspects of each, or could be a combination of all

What is Source Tracking?

- Locating and identifying watershed sources of PCBs
  - Unidentified contaminated sites
    - Location specific
    - Have high PCB soil concentrations compared to background levels
    - Historic/current
    - Primary source of PCB water quality impairments are specific watershed areas with PCB soil contamination
      - Especially in nontidal watersheds
    - Resultant from:
      - Fires, leaks, and spills from old PCB containing equipment
      - Leaks from hazardous waste sites containing PCBs
      - Illegal/Improper dumping
      - Disposal of PCB containing products not designed to handle hazardous materials
    - Contrast to background levels
      - Diffuse
      - Primarily due to atmospheric deposition

Potential PCB Source Tracking Methods

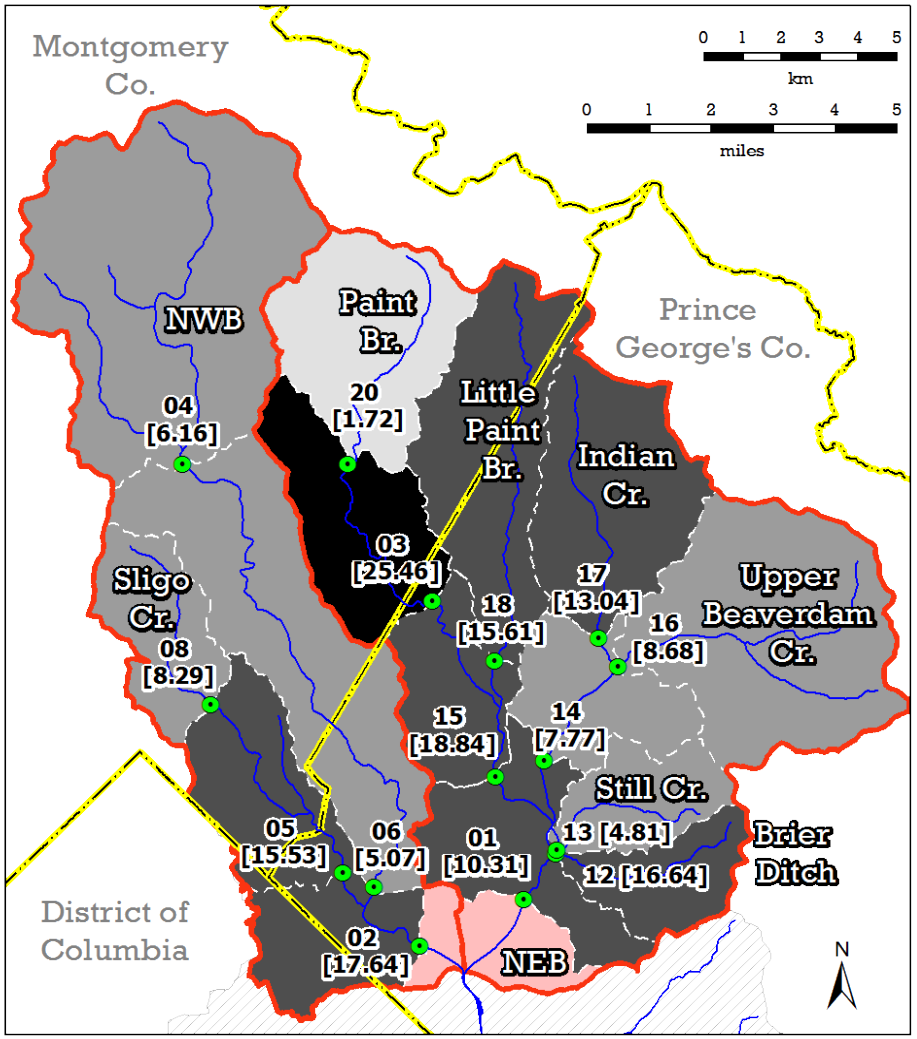
- What to focus sampling efforts on?
  - Stormwater BMPs
    - Sediment
  - Stormwater Conveyance System
    - Water Column and Sediment
  - Instream
    - Water Column and Sediment
  - Pilot Watershed
    - Water Column and Sediment

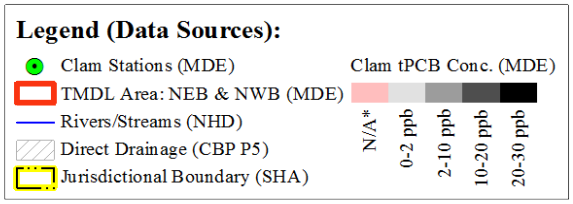
Targeting Source Tracking

- Focus source tracking efforts in areas that are likely to have PCB soil concentrations greater than background levels
  - More efficient use of resources
- Available data that could be used to target source tracking
  - Clam Data
  - NPDES Permits
    - SIC Codes with PCB Potential
  - Regulated Industrial Facilities
  - Industrial Land Use
  - County Records
  - Identified Contaminated Sites
  - High Density Urban Areas

Clam Data

- Nontidal Anacostia River
- Collected by MDE in 2007
- 15 stations
- Measured tPCB concentrations in clam tissue
  - Bioaccumulation
- Applied in TMDL development
  - Used to apportion allocations from Tidal Potomac/Anacostia River PCB TMDL to source sectors in the nontidal TMDL
- Target monitoring in subwatersheds with highest clam tPCB concentrations





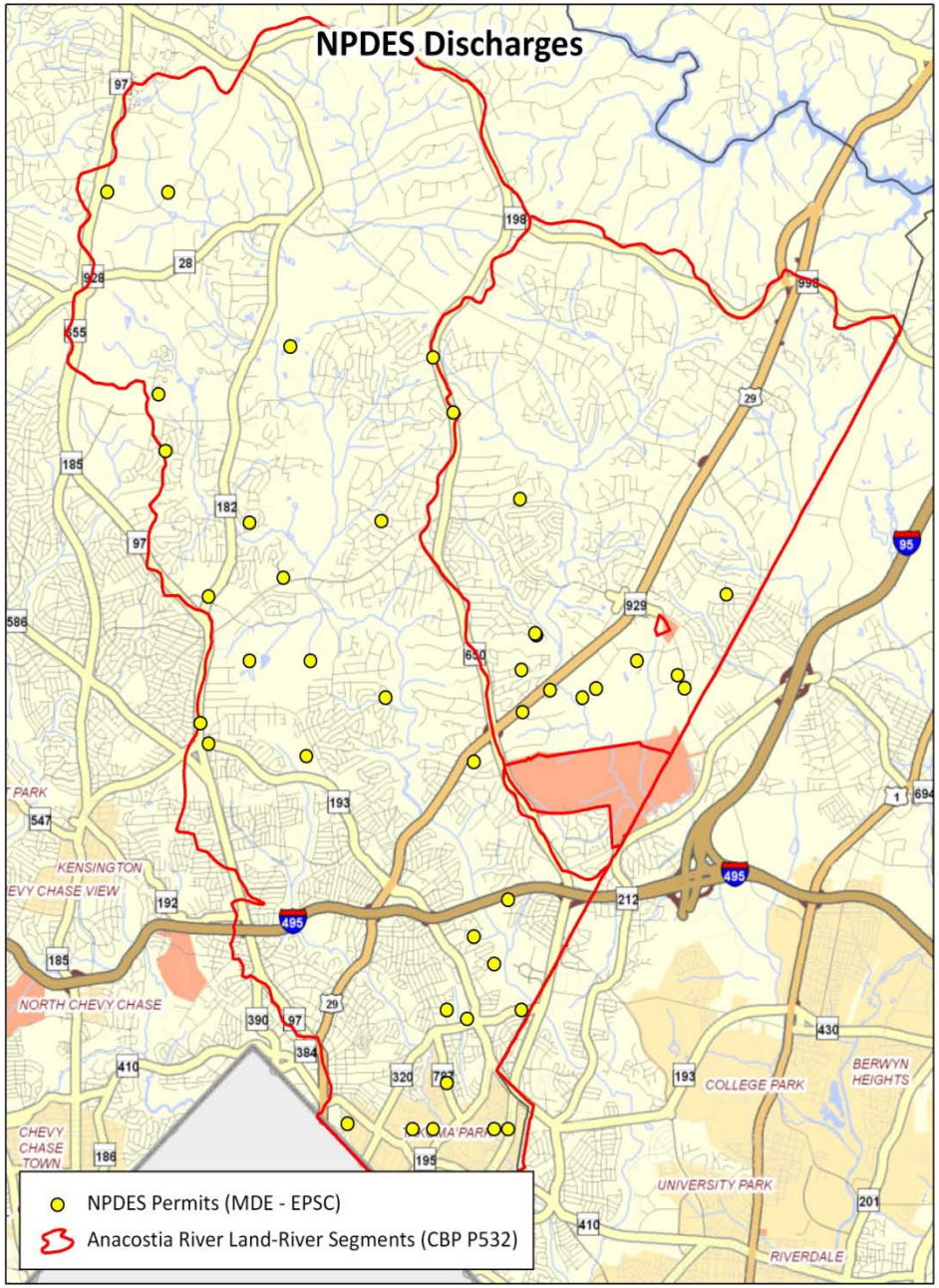
Martin O'Malley, Governor
Anthony G. Brown, Lt. Governor
Shari T. Wilson, Secretary
Robert Summers, Deputy Secretary

Map Production Date: April 7, 2010

StationNr	Branch	tPCB (ng/g)
1	NEB	10.31
2	NWB	17.64
3	NEB	25.46
4	NWB	6.16
5	NWB	15.53
6	NWB	5.07
8	NWB	8.29
12	NEB	16.64
13	NEB	4.81
14	NEB	7.77
15	NEB	18.84
16	NEB	8.68
17	NEB	13.04
18	NEB	15.61
20	NEB	1.72

NPDES Permits

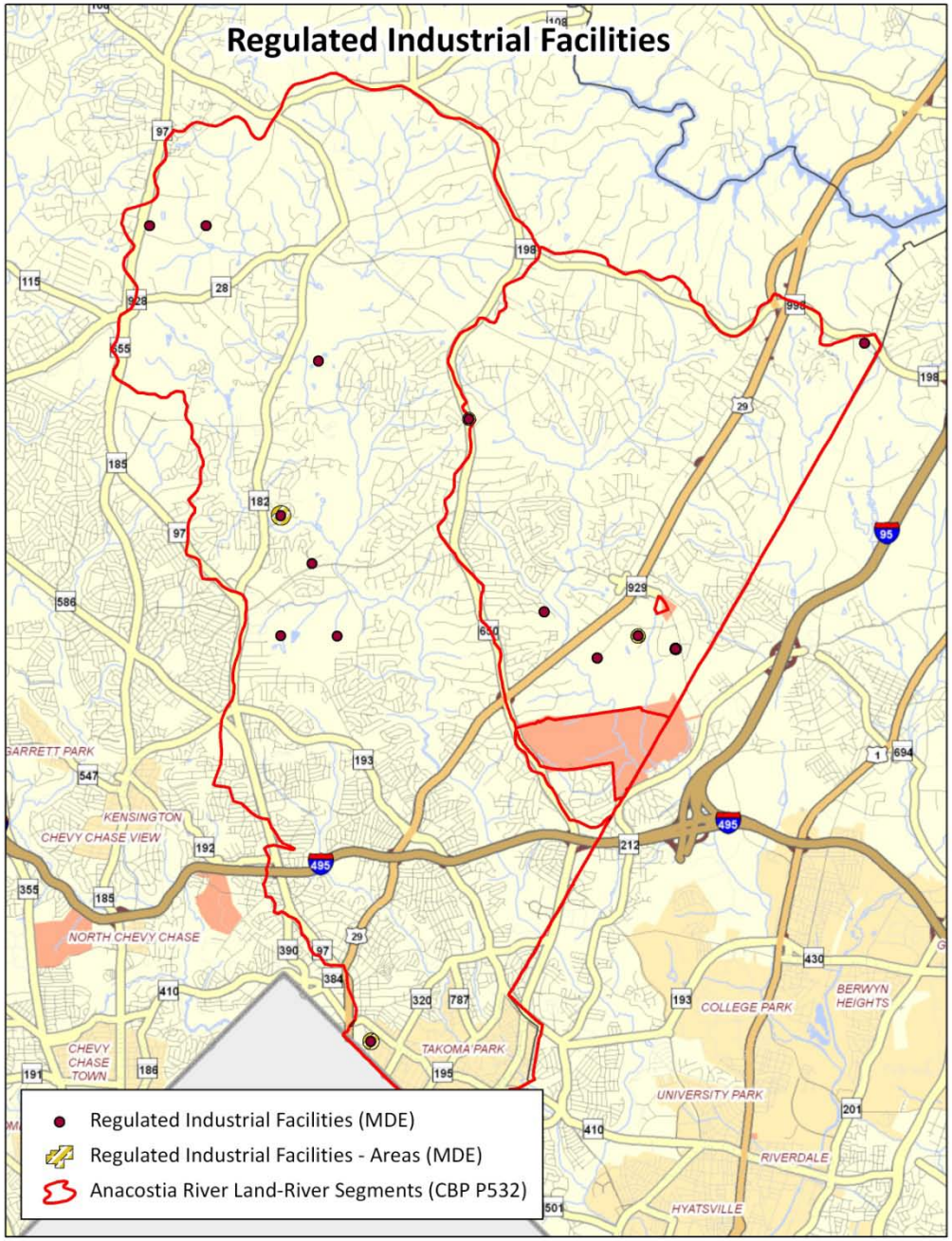
- MDE and EPA have geographic coordinates for all NPDES permits
  - Databases
    - EPSC (MDE)
    - ICIS (EPA)
- NPDES permitted facilities are generally associated with industrial applications.
- The storage, use, and manufacturing of PCB containing equipment is associated with industrial applications
- Target monitoring – work/coordinate with permitted facilities:
  - Downstream of NPDES facilities
  - In stormwater conveyance systems draining NPDES facilities
  - Stormwater BMPs associated with the NPDES facilities



FACILITY NAME	TYPE	NPDES#
PERCONTEE, INC. - MCCENEY TRACT	WMA5	MDG499863
WMATA - WHEATON STATION	WMA1	MD0062561
NOB HILL	WMA5	MDG766487
OAK HILL APARTMENTS	WMA5	MDG766529
MONTGOMERY PAINT BRANCH	WMA5	MDG766581
WHITE OAK TOWERS APARTMENTS	WMA5	MDG766590
HAMPSHIRE TOWERS	WMA5	MDG766946
LONG BRANCH OUTDOOR POOL	WMA5	MDG766654
KEMP MILL SWIM CLUB	WMA5	MDG766438
CALVERTON SWIM CLUB	WMA5	MDG766236
PARKLAND POOL ASSOCIATION	WMA5	MDG766519
FRANKLIN KNOLLS SWIM CLUB	WMA5	MDG766791
TWIN FARMS SWIM & TENNIS CLUB	WMA5	MDG766848
ROBIN HOOD SWIM CLUB	WMA5	MDG766874
MONTGOMERY COLLEGE - TAKOMA PARK	WMA5	MDG766149
COLUMBIA UNION COLLEGE	WMA5	MDG766482
OAKVIEW POOL	WMA5	MDG766271
BEL PRE RECREATION ASSOCIATION	WMA5	MDG766474

Regulated Industrial Facilities

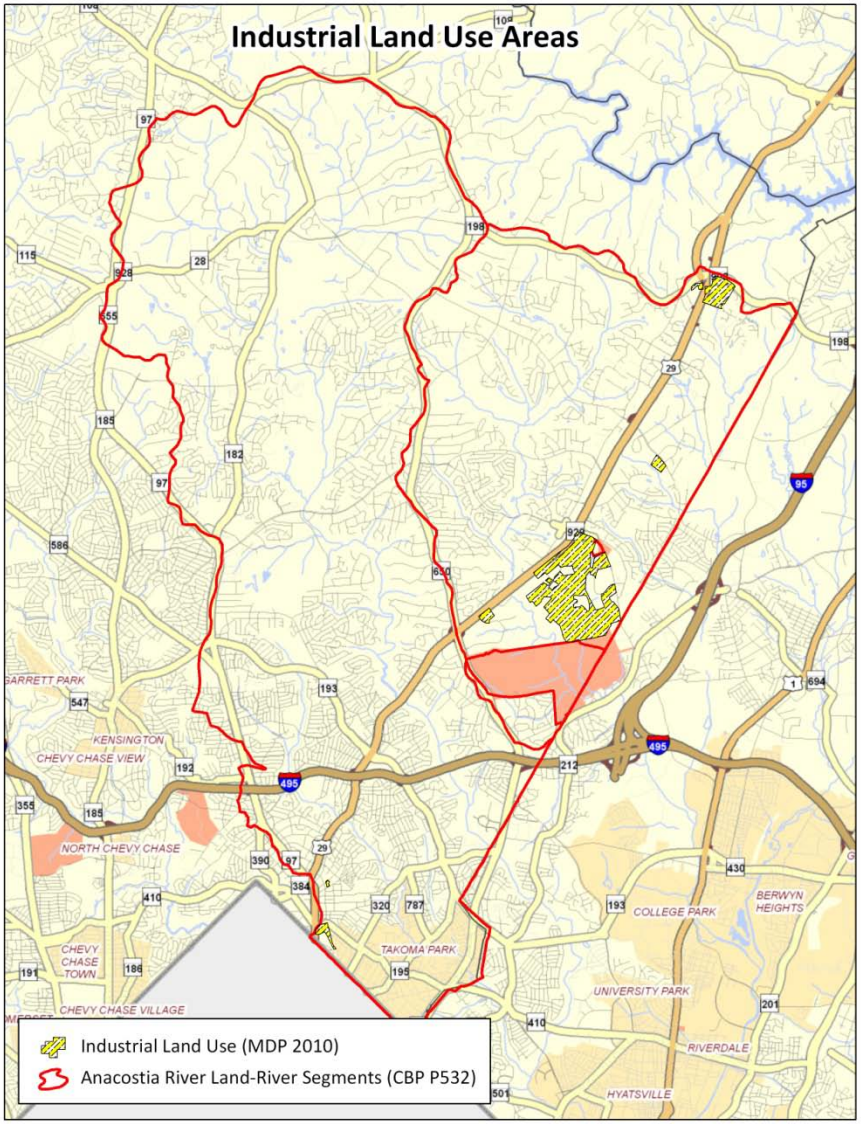
- MDE developed a statewide coverage of all industrial facilities regulated for stormwater discharges
  - Industrial stormwater permits
  - Industrial process water permits
    - Stormwater requirements
  - Developed from permit NOIs
  - Applied in:
    - CBP P5.3.2 land use development
    - Chesapeake Bay Phase II WIP development
  - Target monitoring – work/coordinate with permitted facilities :
    - Downstream of regulated industrial facilities
    - In stormwater conveyance systems draining regulated industrial facilities
    - Stormwater BMPs associated with regulated industrial facilities



FACILITY NAME
MONTGOMERY COLLEGE-TAKOMA PARK
INTERNATIONAL FABRICARE
SHA - FAIRLAND SHOP
M-NCPPC - WHEATON REGIONAL PARK
MONTGOMERY COUNTY SCHOOLS - WEST FARM DEPOT
M-NCPPC - BROOKSIDE GARDENS MAINTENANCE YARD
M-NCPPC - MARTIN LUTHER KING, JR. PARK
MONTGOMERY CNTY PUBLIC SCHOOLS – RANDOLPH
WMATA - GLENMONT METRORAIL YARD
MONTGOMERY COUNTY COLESVILLE DEPOT
M-NCPPC - LAYHILL/BONIFANT RUBBLE FILL
THE RECYCLING CENTER
M-NCPPC - OLNEY MANOR PARK MAINTENANCE YARD
TROTTERS GLEN GOLF COURSE

Industrial Land Use

- Applicable Datasets
  - MDP - 2010
  - MDP - Historic
    - 1990 is oldest dataset MDE has access to
    - MDP could have older datasets
  - County - 2007?
  - County - Historic
    - Does the county have historic data?
- Target monitoring:
  - Downstream of industrial land uses
  - In stormwater conveyance systems draining industrial land uses
  - Stormwater BMPs associated with industrial land uses



County Records

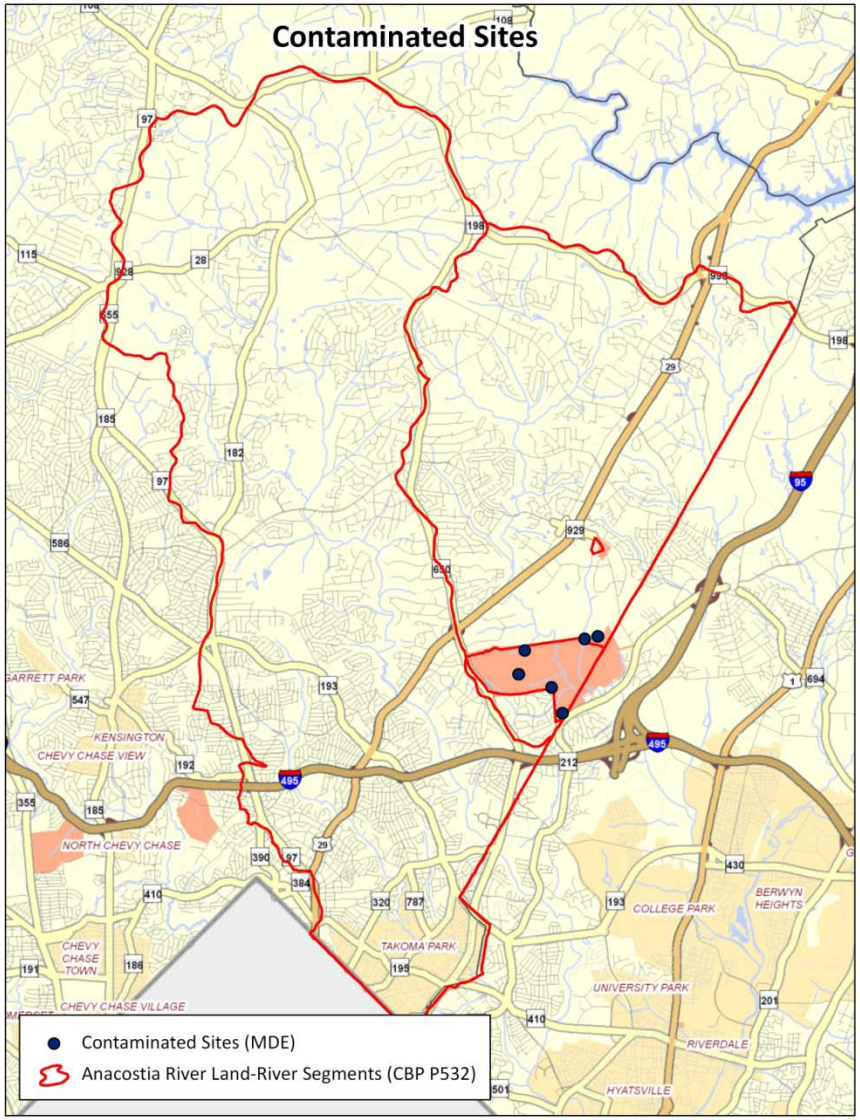
- Does the county have record of specific areas, buildings, and facilities that are known to have previously stored PCBs and/or have documented spills of PCB containing oils?
  - i.e., Property records
- Target monitoring:
  - Downstream of these areas
  - In stormwater conveyance systems draining these areas
  - Stormwater BMPs associated with these areas

County Records - Alternative

- MDE - LMA suggested alternative if the county does not have specific property records, historical records, etc. of PCB storage, use, spills, etc.
- ERD – Environmental Data Resources
  - Comprehensive Database Searches
  - Consultant
- Conduct Phase I Site Assessment
  - County-Watershed wide
  - Pilot Subwatershed
  - Target based on other data
  - Cost dependant
    - According to MDE – LMA can be expensive
- Use Site Assessment to target monitoring:
  - Downstream of these areas
  - In stormwater conveyance systems draining these areas
  - Stormwater BMPs associated with these areas

Contaminated Sites

- SSA identified several contaminated sites during TMDL development
  - Identified from LMA - Land Redevelopment Program's site database and site records
  - Most have been remediated to LMA standards
  - Calculated loadings based on site tPCB soil concentrations and physical characteristics
  - SSA is currently collecting water column/sediment samples to see if these sites are still active sources
- Using MDE – LMA's records, the county might be able to identify contaminated sites that were possibly overlooked by SSA during TMDL development?



Facility	Site Description	Sub-watershed	Median tPCB (µg/kg)	n[1] [%][2]
White Oak	Site 47 (post remediation)	3	260	35 [70%]
	Site 8 (post remediation)	3	15	7 [54%]
	Site 28 (post remediation)	3	187	40 [82%]
	Site 4 (post remediation)	3	330	5 [100%]
	Site 3 (post remediation)	3	1450	10 [100%]

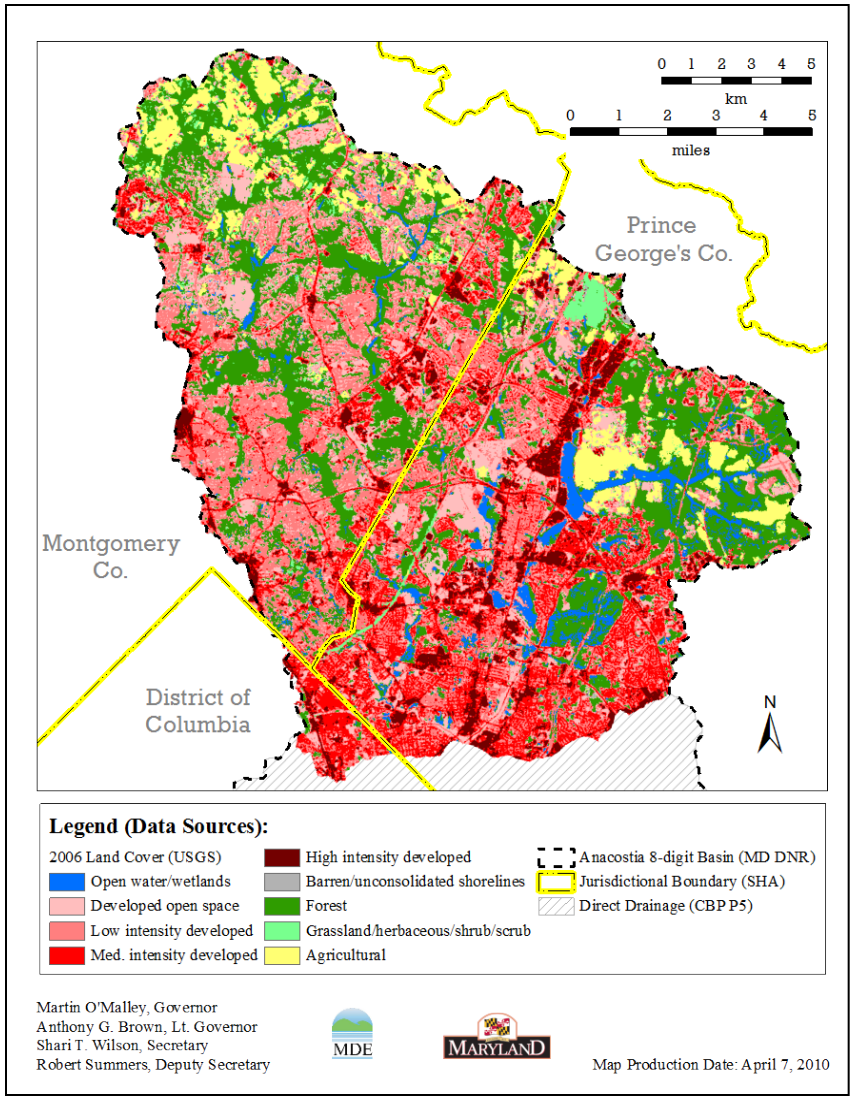
Facility	Site Description	Sub-watershed	EOF PCB Load (g/yr)	DF[1]	EOS PCB Loads (g/yr)
White Oak	Site 47 (post remediation)	3	3.88×10^{-2}	0.45	1.76×10^{-2}
	Site 8 (post remediation)	3	6.52×10^{-7}	0.39	2.57×10^{-7}
	Site 28 (post remediation)	3	2.87	0.38	1.09
	Site 4 (post remediation)	3	1.41×10^{-2}	0.38	5.42×10^{-3}
	Site 3 (post remediation)	3	5.06×10^{-1}	0.91	4.60×10^{-1}

Contaminated Sites

- SSA sediment and water column sampling of contaminated sites
- What further actions could be taken if found to still be a source of the water quality impairment?
  - No further action based on LMA remediation standards
  - Only possibility is LMA Cleanup Standards for Soil and Groundwater
  - Soil concentration back-calculated from groundwater standard
  - Groundwater standard based on drinking water exposure pathway and protection of human health

High Density Urban Areas

- High Density Residential and Commercial Land Uses
- Assumption: these land uses would have a greater number of electrical transformers associated with them.
  - Greater potential for PCB soil contamination due to blown transformers
- Target Monitoring
  - In stormwater conveyance systems draining these land uses
  - Stormwater BMPs associated with these land uses
- Counter: could monitor low and medium density urban areas to rule these areas out as sources
- Assumption: monitoring would indicate that PCB concentrations in these areas are no different than background levels



MARYLAND

Department of the Environment

Targeting Source Tracking - Examples

Stormwater BMP and Stormwater Conveyance System Sampling

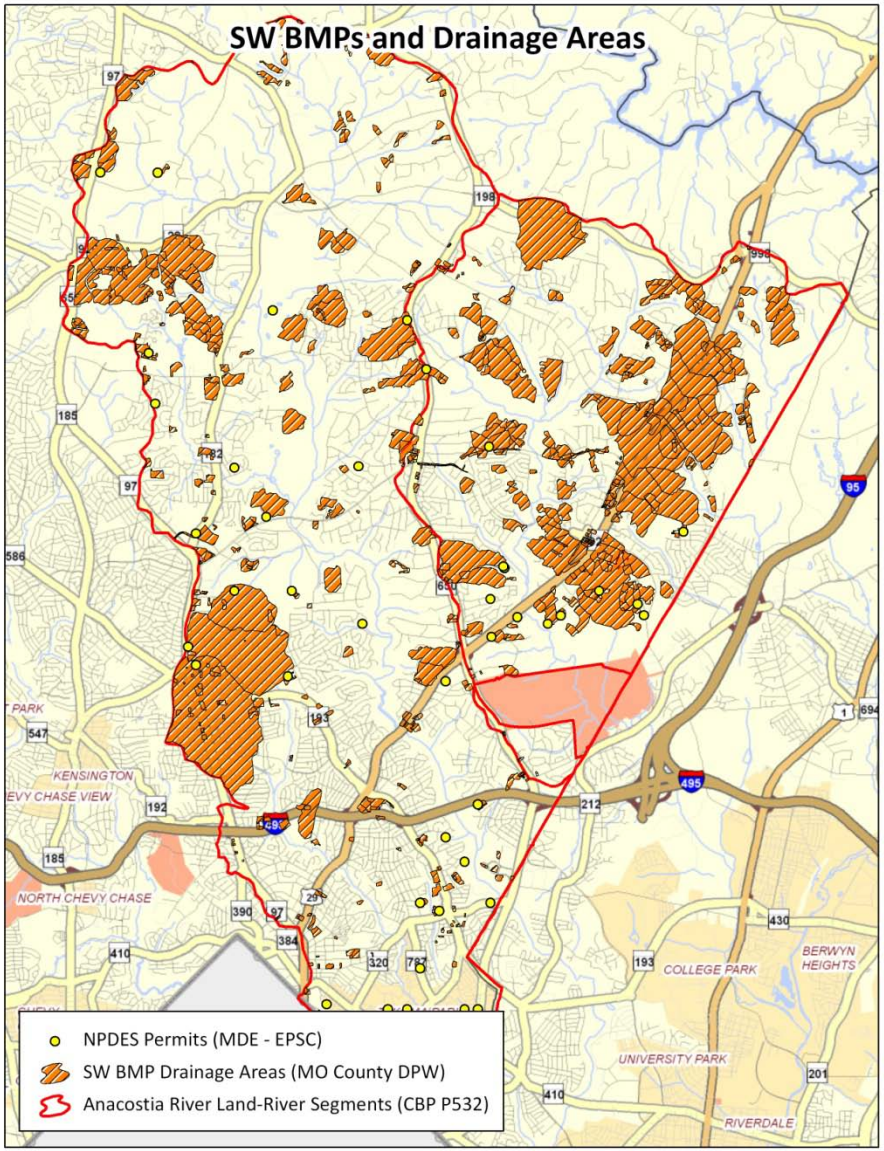
MDE

Stormwater BMP Source Tracking Methodology

One possible method of source tracking/implementation would be to sample the sediments that have accumulated in the county's stormwater BMPs and evaluate their PCB concentrations.

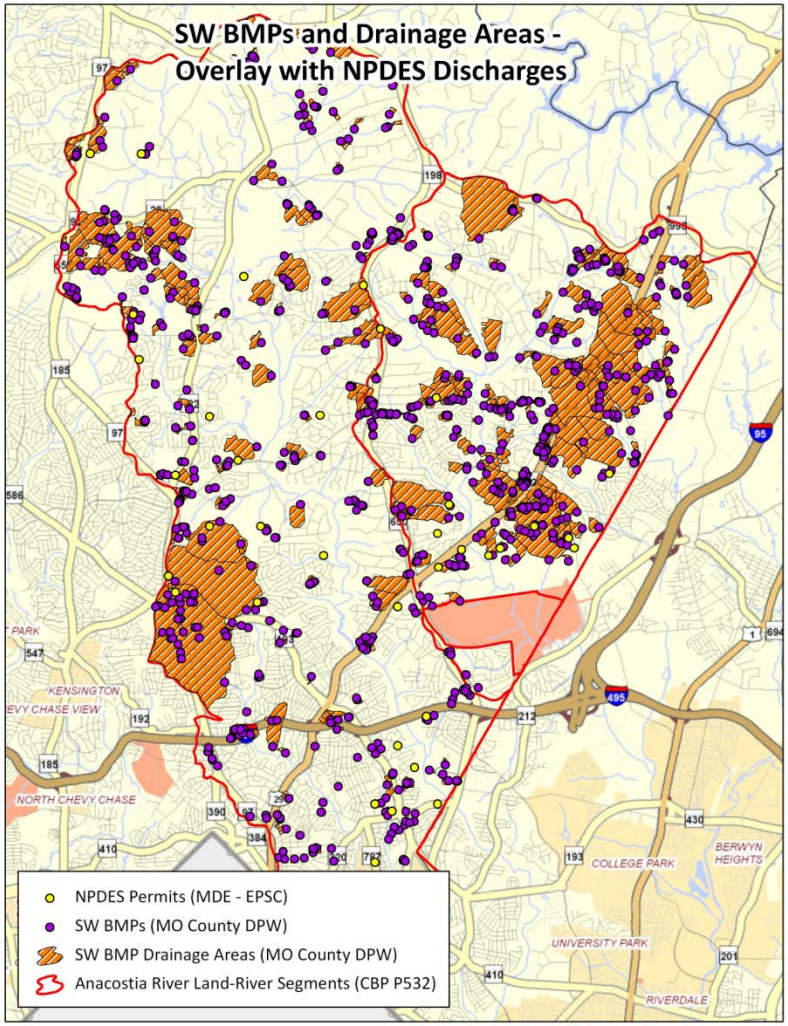
In addition to the possible identification of PCB sources upstream of a given BMP if the samples came back "hot" for PCBs, the analysis also provides the following benefits: 1) the data collected could be used to better estimate the relationship between sediments and tPCBs to use in conjunction with BMP TSS reduction efficiencies, and 2) if maintenance is conducted on a pond (i.e., dredging), the county could claim reductions in PCBs to the stream system based on amt. of sediment removed and avg. PCB concentrations in dredged sediments.

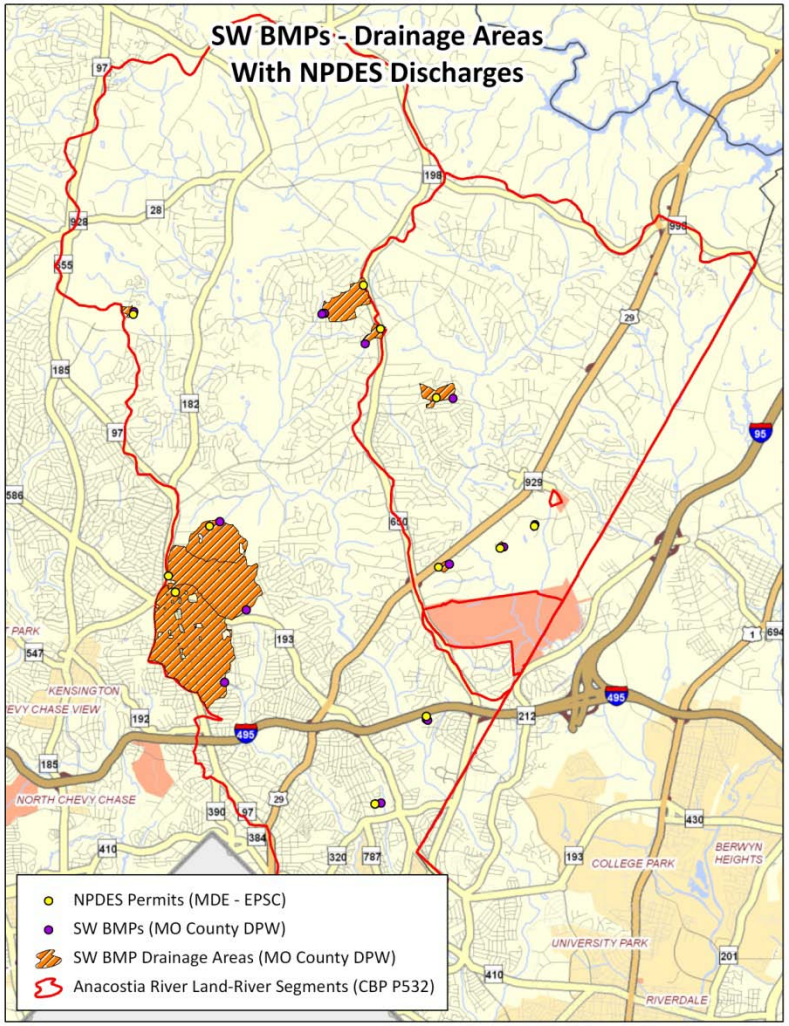
To do this, select the urban stormwater BMPs and their associated drainage areas located within the Anacostia River watershed from the county BMP point and polygon drainage area datasets.



Stormwater BMP Source Tracking Methodology – NPDES Permit Focus

If using the stormwater BMP sampling method to conduct source tracking, to narrow the focus of the sampling efforts to areas that likely have PCB soil contamination, one method would be to overlay the county BMP drainage areas with MDE's point coverage of NPDES discharges, and extract those BMPs that have NPDES discharges located within their drainage areas.

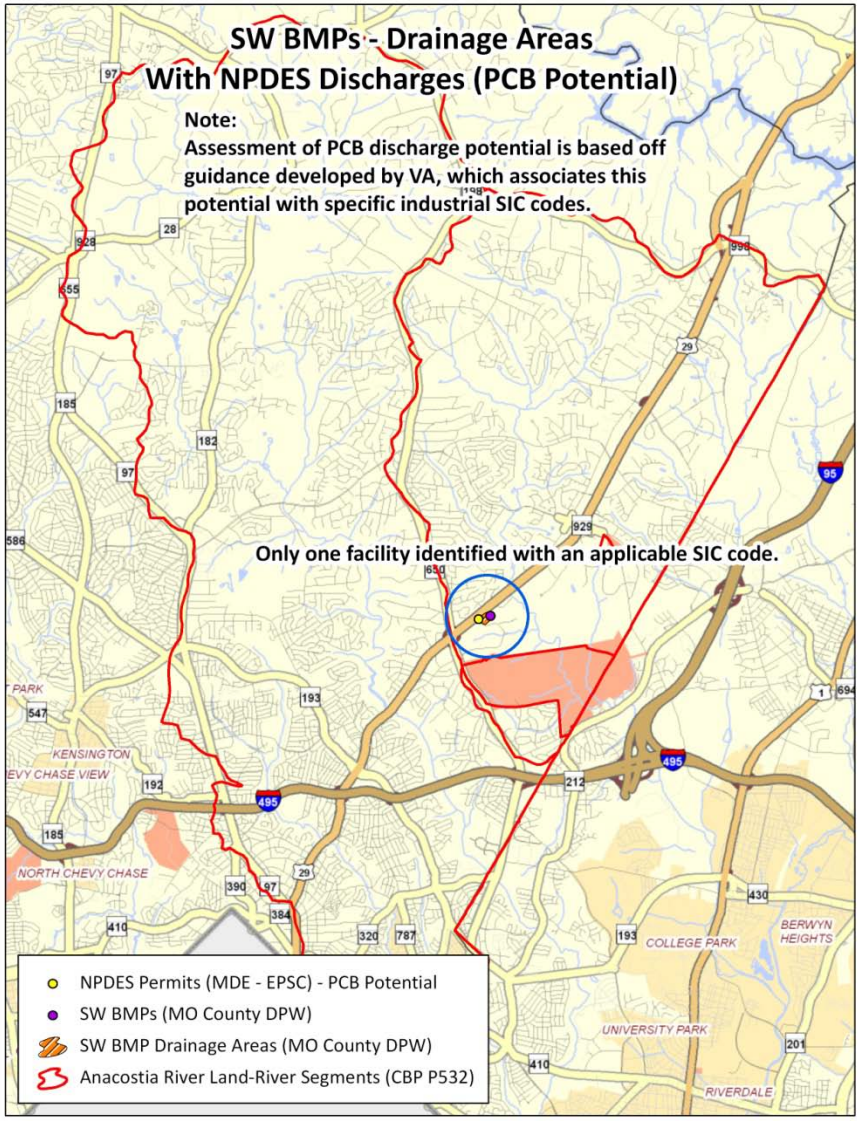




Stormwater BMP Source Tracking Methodology – NPDES Permit Focus

Virginia has developed guidance that they use to focus PCB sampling efforts at industrial facilities. They limit their sampling to facilities with SIC codes that they assume have a reasonable potential for PCB soil contamination on site. To narrow the focus of the source tracking efforts even further, the county could identify which NPDES discharges have one of these SIC codes, and limit their sampling to BMPs with these NPDES discharges located within their drainage area.

Virginia Guidance: *Guidance for Monitoring Point Sources for TMDL Development Using Low-Level PCB Method 1668*



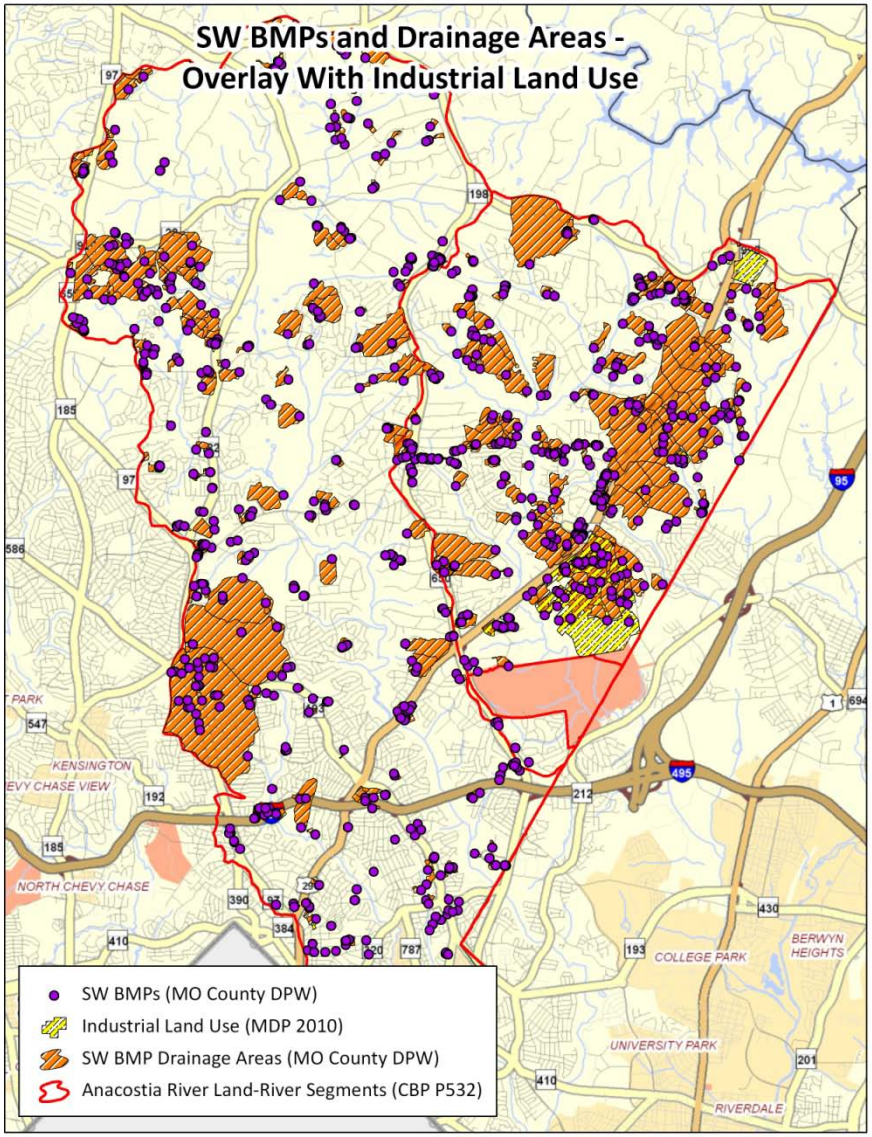
Stormwater BMP Source Tracking Methodology – NPDES Permit Focus

There is only one NPDES discharge with an SIC Code assumed to have the potential for PCB contamination on site and is located within a BMP drainage area in the Montgomery County portion of the nontidal Anacostia River watershed.

Stormwater BMP Source Tracking Methodology – Industrial Land Use Focus

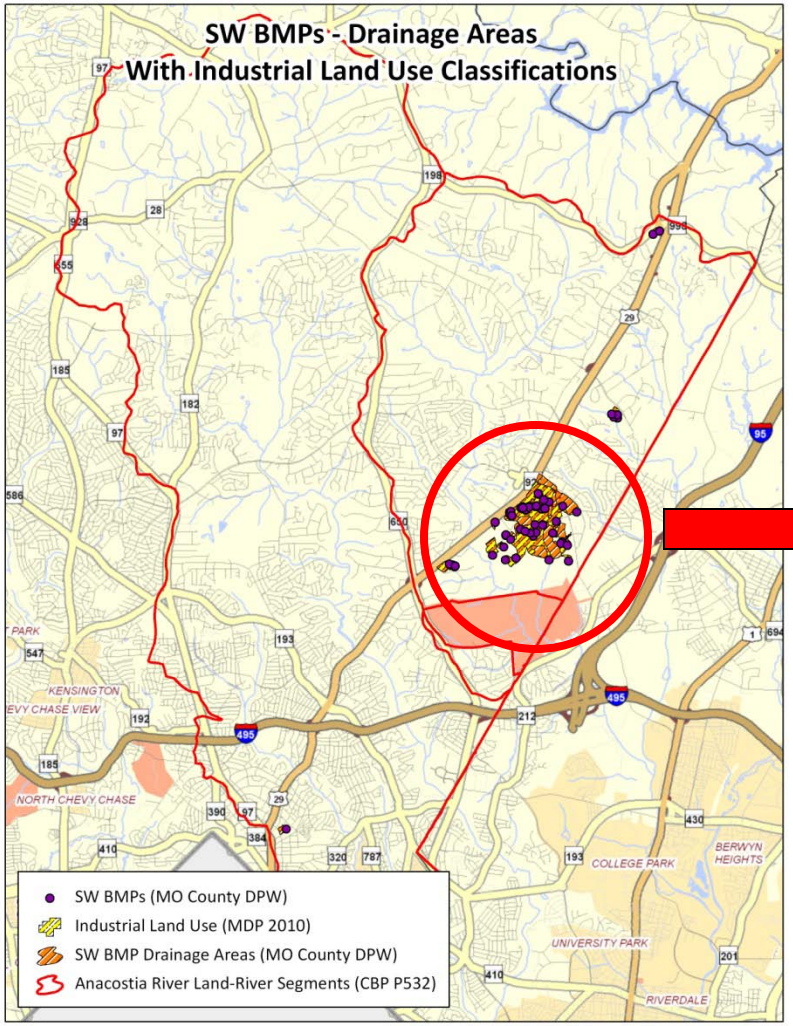
Another method that could be applied to narrow the focus of the sampling efforts to areas that likely have PCB soil contamination, in addition to using NPDES discharge locations, would be to overlay the county BMP drainage areas with current industrial areas, as identified by MDP land use/land cover data (2010). MDP urban land use applies an Anderson Level II classification, where urban areas are classified into residential, commercial, industrial, institutional, and open urban classifications based on zoning data.

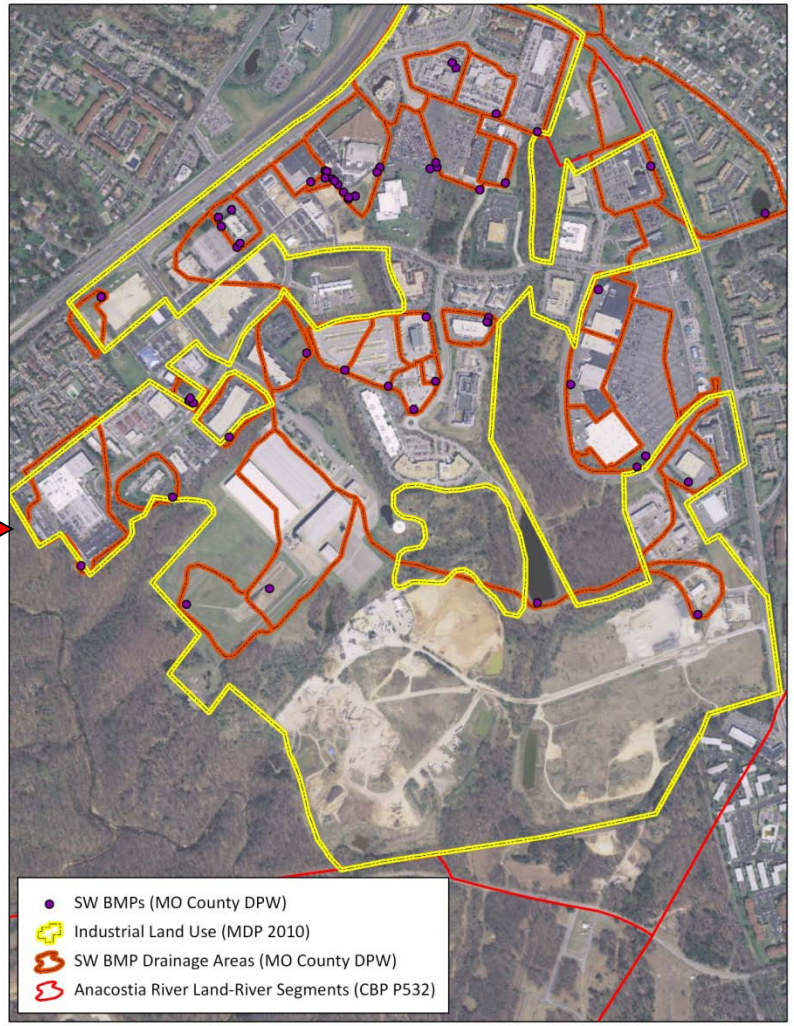
Extract the industrial land use polygons from the MDP dataset and overlay them with the BMP drainage areas.



Stormwater BMP Source Tracking Methodology – Industrial Land Use Focus

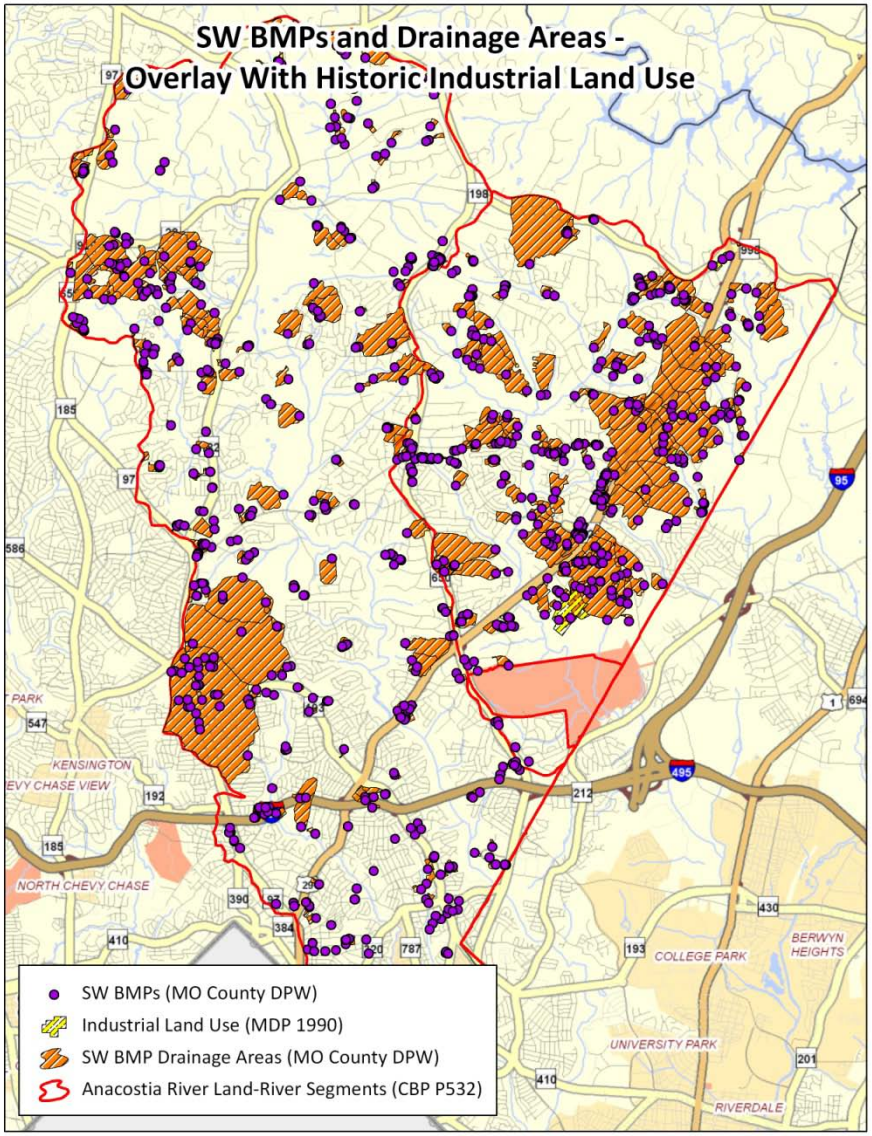
Based on the overlay with MDP's industrial land use polygons, extract those BMPs that have industrial sites located within their drainage areas.





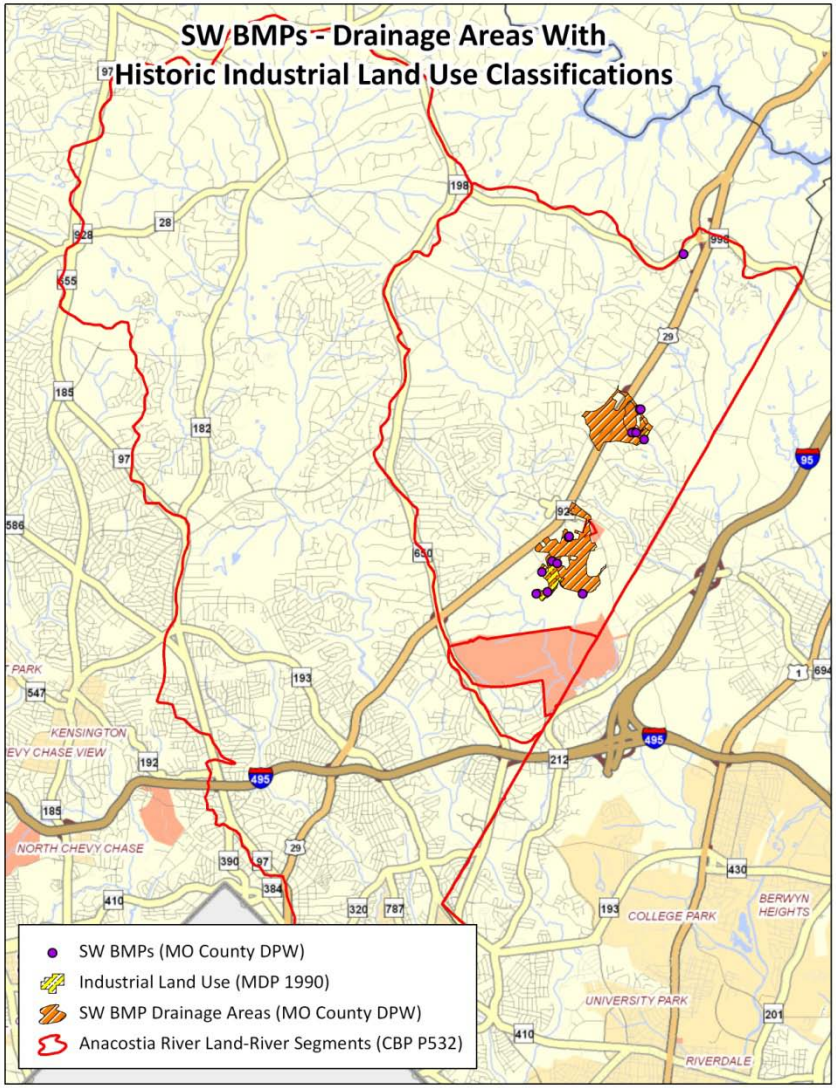
Stormwater BMP Source Tracking Methodology – Historic Industrial Land Use Focus

Another method to narrow the focus would be to overlay the county BMP drainage areas with industrial sites as identified by historic MDP land use data (1990 – oldest MDP land use dataset MDE has available). If the county can access more historic MDP land use data that pre-dates 1990, or if the county has any historic land use data of its own, especially if it pre-dates 1990, it might be worthwhile to apply this data instead.



Stormwater BMP Source Tracking Methodology – Historic Industrial Land Use Focus

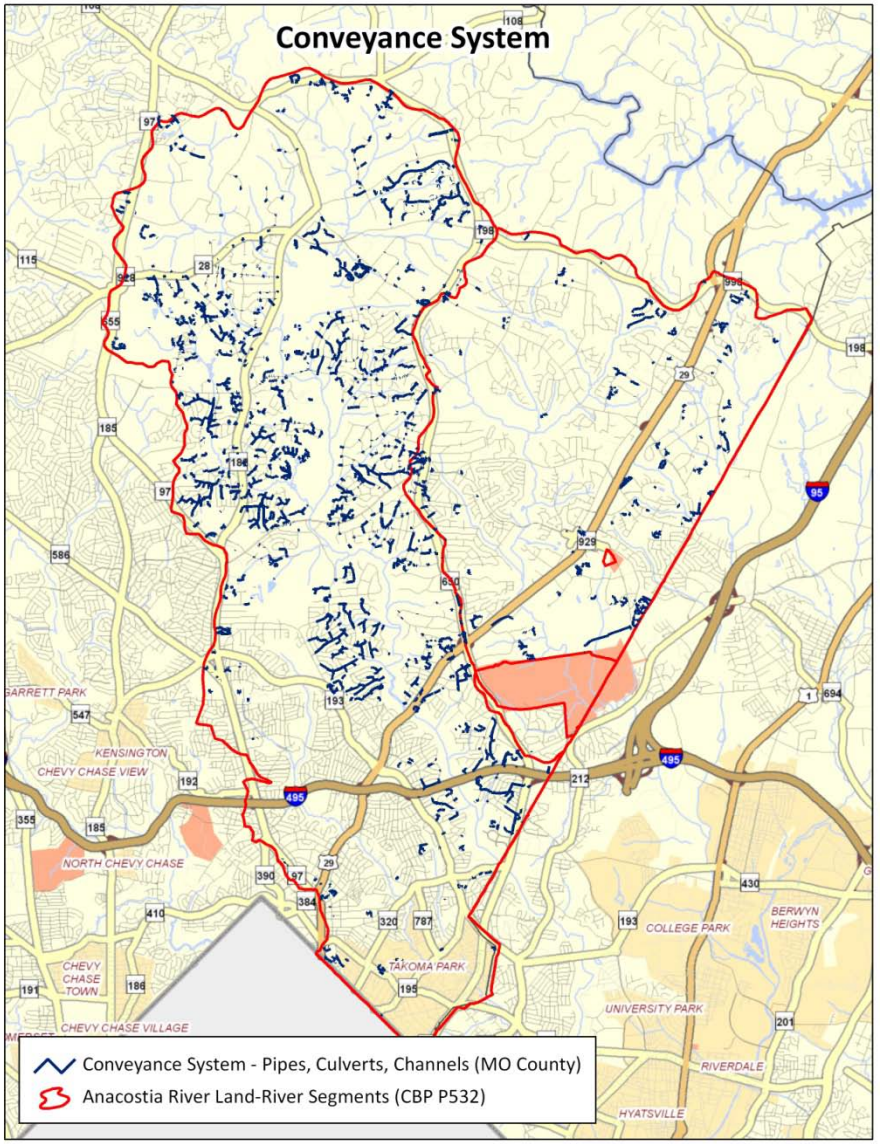
Based on the overlay with MDP's historic industrial land use polygons, extract those BMPs that at one point had industrial sites located within their drainage areas.



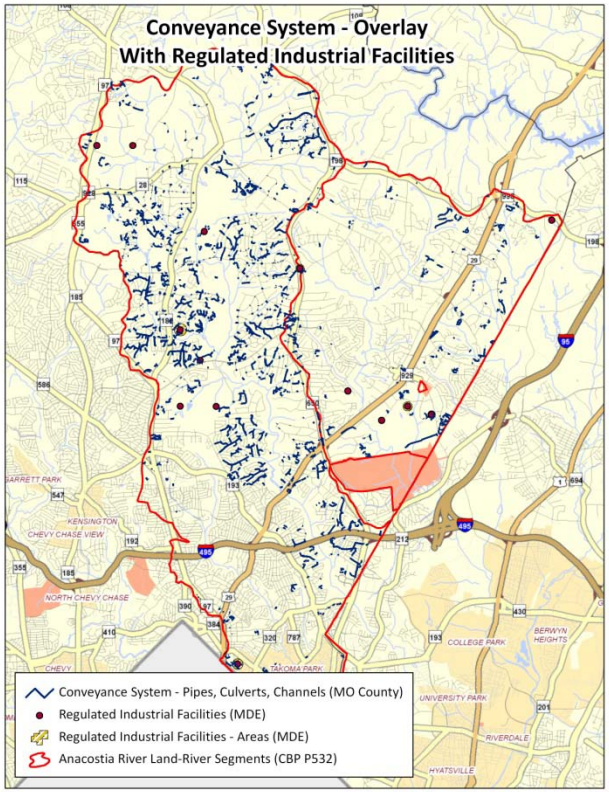
Conveyance System Source Tracking Methodology

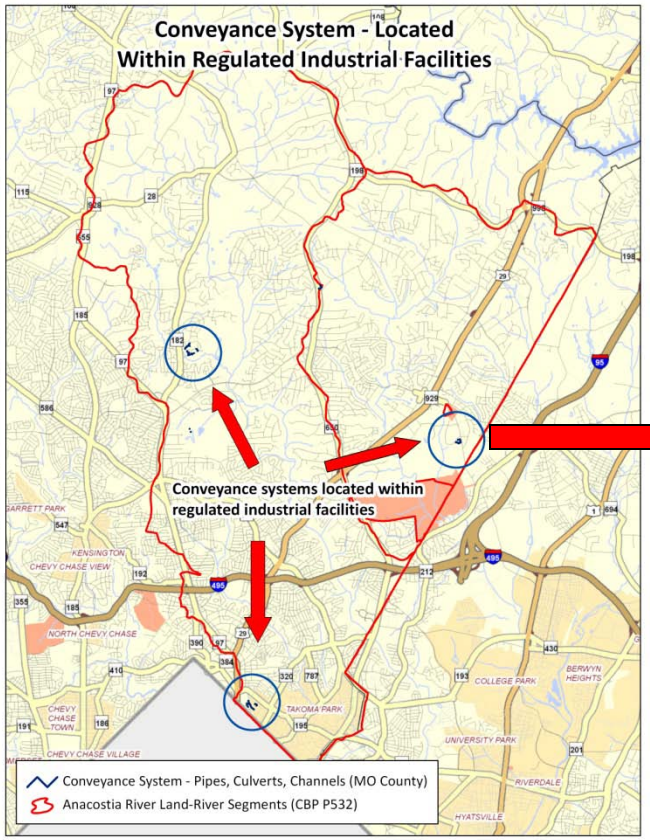
Another possible method of source tracking/implementation would be to take water column samples and/or sediment samples from the actual stormwater conveyance systems in the watershed. This could provide a means of source tracking, if certain systems came back “hot” for PCBs.

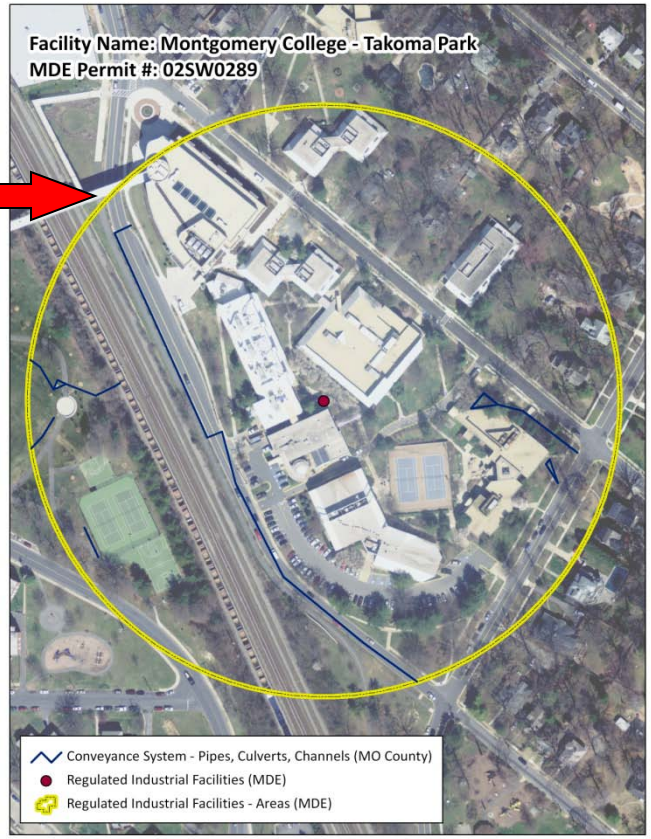
To narrow the focus of this source tracking effort to areas that likely have PCB soil contamination, overlay the county’s mapped conveyance system (pipes, culverts, and channels) with delineations of 1) MDE’s regulated industrial facilities, 2) NPDES discharges, and 3) MDP industrial land use areas. Then, extract those conveyance systems located within these areas. Target these conveyance systems for sampling.



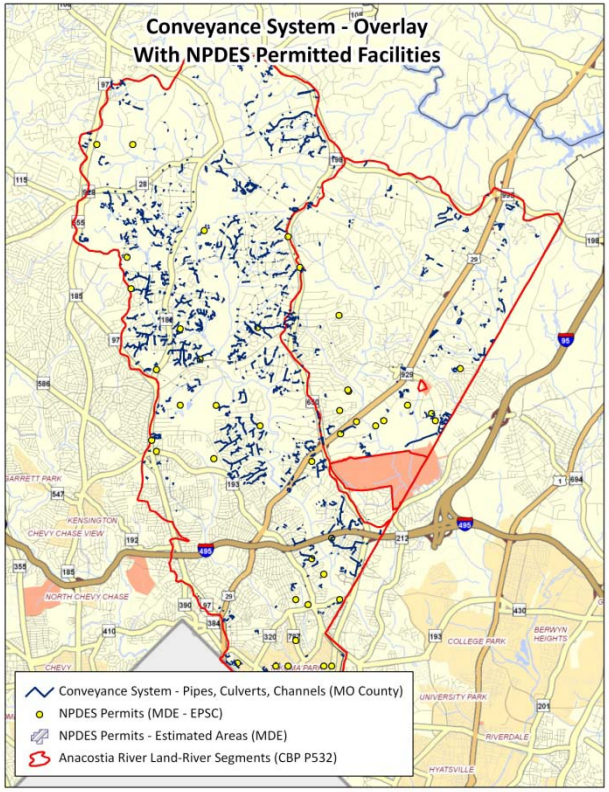
Conveyance System Source Tracking Methodology – Regulated Industrial Facility Focus

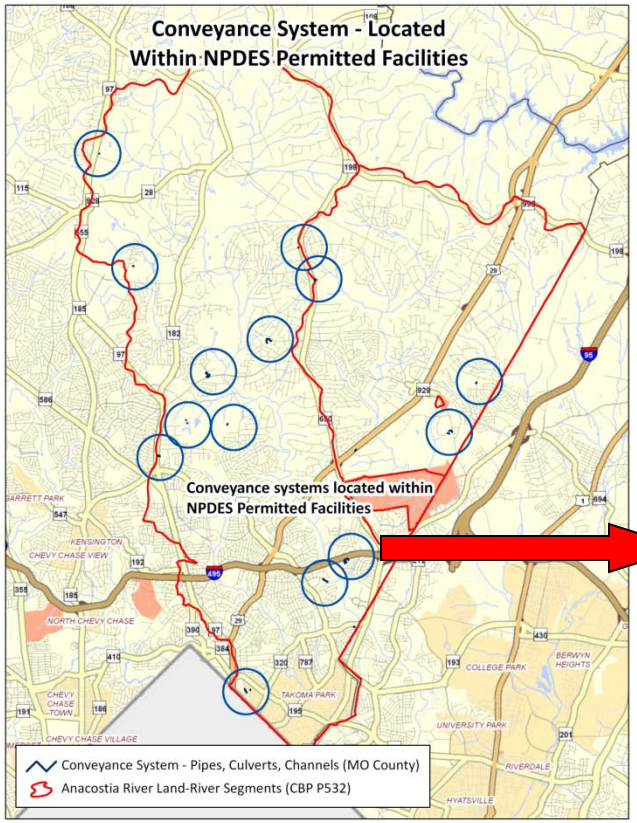




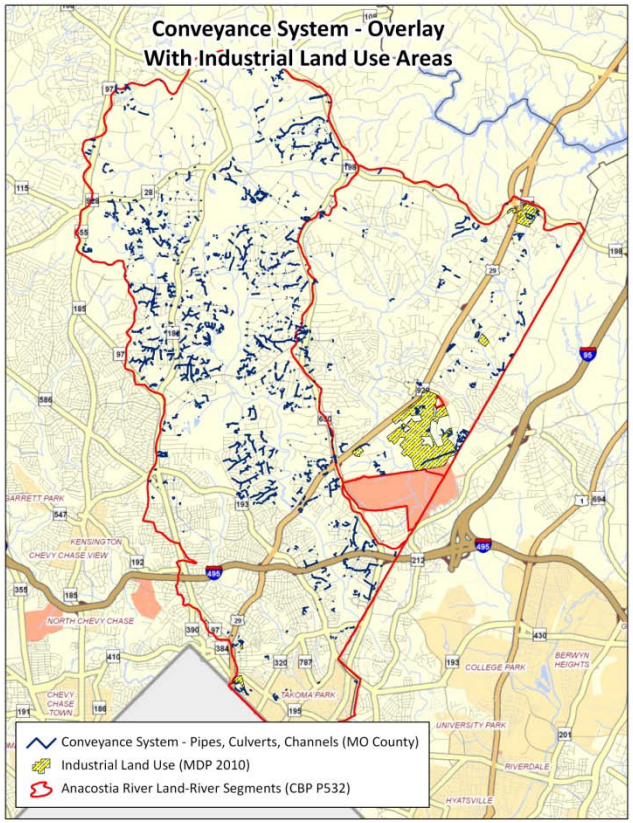


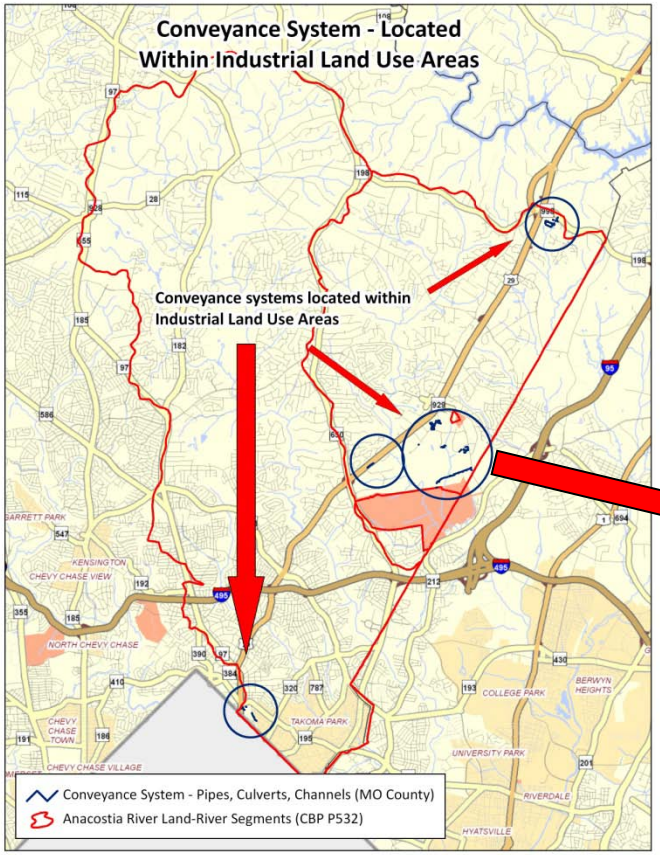
Conveyance System Source Tracking Methodology – NPDES Permit Focus

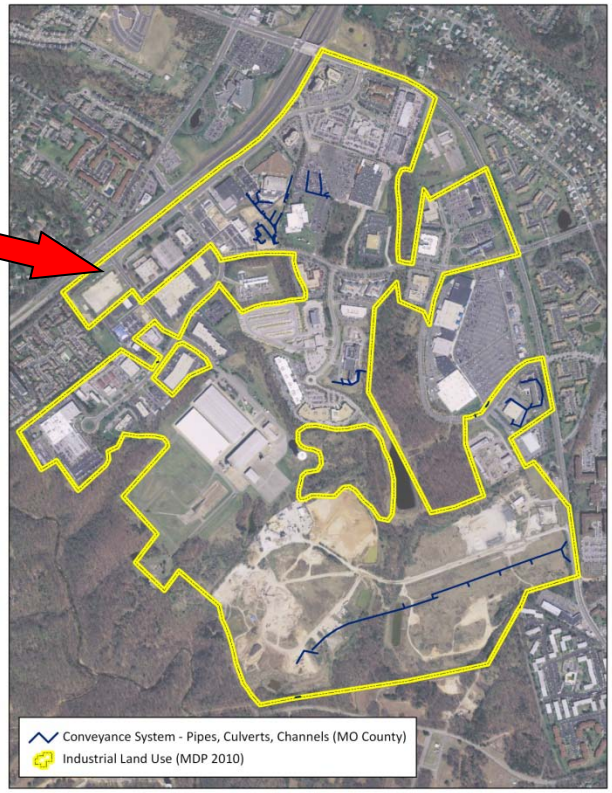




Conveyance System Source Tracking Methodology – Industrial Land Use Focus







Remediation Process

- If the tracking efforts are able to identify watershed sources of PCBs to the stream system, what process would occur to remediate these sites?
- Report sources to EPA
  - Toxic Substances Control Act (TSCA)
    - Remediation Standard
      - 1 ppm
      - Site conditions and possible exposure pathways factored into any possible corrective site measures
- If EPA determines no action required
  - MDE – LMA
    - No regulations in place to force remediation
    - More or less voluntary on property owners behalf
    - Site specific determination if remediation is required
    - Two programs:
      - Voluntary Cleanup Program (VCP)
        - » more favorable for property owners
        - » Once MDE determines the no further site actions required, site file is closed for good
      - Controlled Hazardous Substances (CHS) Program
        - » State Superfund

Additional Notes

- All sampling efforts should use EPA Method 1668A or a similar method
  - Low detection levels
  - Congener specific results
- Complimentary SSA sampling efforts
  - Watershed cycling strategy
  - Fish tissue monitoring
- General implementation thoughts
  - Focus first on sources with greatest impacts on water quality
    - Goal of trying to target source tracking efforts
  - Consideration to cost and relative ease of implementation
    - Goal of trying to target source tracking efforts
  - Evaluation of implementation efforts
    - Possible improvements
    - Trial and error process with PCBs
    - Source tracking efforts could be unsuccessful
    - Source could be diffuse
    - Need to adjust implementation