

Halfway, Silver, and Shantee Creeks Analysis

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Assessment and remediation efforts occur throughout the Maumee AOC but few efforts have focused upon Halfway, Silver, and Shantee creeks.

U.S. EPA Region 5 contracted Tetra Tech to develop the Halfway, Silver, and Shantee Creeks Analysis (HSSCA).

Study Objectives

- Identify possible ongoing sources of contamination and locations of historic contamination.
- Delineate critical areas to be addressed by future activities, including remediation.
- Determine appropriate control strategies to remediate the pollutant sources.

Project Summary



- Compile and evaluate secondary data
- Characterize the HSSCA project area
- Water quality assessment
- Identify pollutants of concern (POCs)
- Identity sources of the POCs
- Evaluate fate and transport of POCs from sources to in-stream impairments
- Delineate critical areas
- Recommend future activities



Maumee AOC & HSSCA Project Area





Focus on the AOC-portion of the HSSCA project area (i.e., Ohio-side)

Watershed Characterization





Watershed Characterization





Water Quality Assessment



Available Environmental Data

- Aquatic biology (e.g., IBI)
- Fish tissue chemistry
- Aquatic habitat (e.g., QHEI)
- Surface water chemistry
- Groundwater chemistry
- Sediment chemistry





Water Quality Assessment





Identify Pollutants of Concern



- Environmental Data
 - Water column chemistry
 - Sediment chemistry
 - Fish tissue chemistry



- Spills Reports
 - Mostly generalized POCs (e.g., gasoline, diesel fuel)
 - Sometimes specific (e.g., mercury, cyanide)
- Facility Records

Identify Pollutants of Concern

Metals

- Cr, Cu, Pb, Zn
- As, Cd, Hg, Ni

Organics

PAHs

PCBs

	Water column		Fish tissue	Sediment						
POC	Detected ^a	WQS ^b	Detected ^a	Detected ^a	SRV ^b					
Metals										
Arsenic	Detected	Less than	ND							
Cadmium	Detected	Less than	Detected	Detected	Exceed					
Chromium	Detected	Less than		Detected	Less than					
Copper	Detected	Exceed		Detected	Exceed					
Lead	Detected	Exceed	Detected	Detected	Exceed					
Mercury	Detected	Less than	Detected	Detected	Less than					
Nickel	Detected	Less than		Detected	Less than					
Selenium	ND	n/a	Detected	ND	n/a					
Zinc	Detected	Exceed		Detected	Exceed					
Polycyclic Aromatic Hydrocarbons										
2-Methylnaphthalene				Detected	Exceed					
1,1,1-Trichloroethane	Detected	Less than			n/a					
Benz[a]anthracene	ND	n/a		Detected	Exceed					
Benzo[a]pyrene	ND	n/a		Detected	Exceed					
Benzo[b]fluoranthene	ND	n/a		Detected	Exceed					
Benzo[g,h,i]perylene	ND	n/a		Detected	Exceed					
Benzo[k]fluoranthene	ND	n/a		Detected	Exceed					
bis(2-Ethylhexyl)phthalate	ND	n/a		Detected	Exceed					
Chloroform	Detected				n/a					
Chrysene	ND	n/a		Detected	Exceed					
Fluoranthene	ND	n/a		Detected	Exceed					
Indeno(1,2,3-cd)pyrene	ND	n/a		Detected	Exceed					
Phenanthrene	ND	n/a		Detected	Exceed					
Pyrene	ND	n/a		Detected	Exceed					
Polychlorinated Biphenyls										
PCB 1242			ND	Detected	Exceed					
PCB 1248			Detected	ND	n/a					
PCB 1260			Detected	Detected	Exceed					
Pesticides										
Aldrin	ND		Detected		n/a					
gamma-BHC (Lindane)	ND		ND		n/a					
4,4'-DDD		n/a	Detected		n/a					
4,4'-DDE		n/a	Detected		n/a					
Dieldrin	ND		Detected		n/a					
Endrin	Detected	Exceed	ND		n/a					
Hexachlorobenzene		n/a	Detected		n/a					
Methoxychlor	Detected		ND		n/a					
Mirex	Detected		ND		n/a					

Sources of Pollutants

Program	Number of Records
Federal Registry System	488
National Pollutant Discharge Elimination System	51
Part 201 sites (Michigan)	5
Resource Conservation and Recovery Act	266
Superfund	5
Toxic Release Inventory	11
Underground storage tanks	318
Underground storage tanks (leaking)	223
Volunteer Action Program (Ohio)	1



Sources of Pollutants



Fate & Transport



- Environmental Data
 - Limited in-stream data
 - Insufficient data to link to potential sources
- Spill Reports
 - Identify in-stream contamination



http://toxics.usgs.gov/regional/emc/images/transport_figure_lg.jpg

- Investigates sources and pollutant transport
- POCs often migrate via storm sewers

Fate and Transport





Identify & Delineate Critical Areas





Identify & Delineate Critical Areas







- Limited water quality data (1993 QHEI = very poor)
- Facilities as potential sources
 - BUSTR (19 UST records)
 - RCRA (19 records)
- Spills and releases
 - BUSTR (18 LUSTs records)
 - Ohio EPA DERR (5 records)
 - U.S. EPA, Region 5 (1 record)







Spill Responses

- Ohio EPA DERR spill reports
- U.S. EPA OSC spill reports

0 500 1,000 Feet

Note: Arrows identify the direction of streamflow.



- BUSTR LUSTs (18 inactive records)
 - Closure (9) & suspected contamination (9)
 - No Further Action (17) & disproval of release (1)
- Spills Reports (6 records)

		Date spill	Spilled	Volume	Receiving	Importance
Agency	Spill ID	reported	product name	(gallons)	waterbody	of spill "
DERR	1995-3672	9/28/1995	gasoline	unknown	none reported	•
DERR	1997-1942	5/20/1997	gasoline	20	storm sewers	***
			Banner product	unknown		
			mixture ^b	400		
DERR	2003-3033	8/6/2003	diesel fuel	10	storm sewers ^c	**
DERR	2005-0792	2/8/2005	mercury	unknown	none reported	•
DERR	2010-1202	5/6/2010	unknown	50	storm sewer	***
			petroleum		catch basin ^c	
R5	E10522	5/13/2010	weathered	unknown	storm sewers ^c	***
			gasoline			



- Spills and Releases
 - BUSTR LUSTS: no release of POCs
 - Spill reports: minor spills to storm sewers
- Future sampling
 - Tifft Ditch (upper): field parameters, sediment
 - Tifft Ditch (lower) : field parameters, water, sediment
 - Eisenbraum Ditch (lower): field parameters
- Investigate Restoration Opportunities
 - east of Secor Road
 - Foxglove Meadow Park













Tifft Ditch (lower) in Foxglove Meadow Park

Conclusions



- Identify possible ongoing sources of contamination and locations of historic contamination.
 - Compiled and assessed a considerable amount contamination data
 - Identified POCs to be metals, PAHs, an PCBs
- Delineate critical areas to be addressed by future activities, including remediation.
 - Biology and habitat generally poor throughout project.
 - Delineated critical areas for further study that require additional data collection to support future remediation activities
 - A few potential habitat restoration areas were identified.
- Determine appropriate control strategies to remediate the pollutant sources.

Questions & Comments



Summary Report

- Available at the Data Management and Delisting System
- http://dmds.maumeerap.org/view.cfm?type=project&id=425

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