

APPENDIX H.3

INTERVIEW EXHIBITS

WESTFIELD INTERVIEWS

AGENDA

Westfield Interview Workshop

Cool Creek Watershed Management Plan Hamilton County, Indiana

June 20, 2005 – 9:30 a.m. - Noon

1. Introductions and Sign-in
2. Cool Creek Watershed Overview
3. Previous Cool Creek Watershed Planning Efforts
4. IDEM Section 319 Watershed Management Plan Components
5. Discussion of Problem Areas
6. Discussion of Implementation Priorities
7. Closing and Follow Up Action Items



MEETING SUMMARY WESTFIELD STAFF INTERVIEWS

Project: Cool Creek Watershed Management Plan
Date: June 20, 2005
Time: 9:30 a.m.
Location: Westfield Town Hall
Staff Attendees: Sign In Sheet Attached

A staff interview session was held to introduce the update of the Cool Creek Watershed Management Plan to the Town of Westfield and to solicit input and answer questions. Ten people attended the meeting. The following is a summary of this interview session.

Hans Peterson initiated the session by conducting informal introductions, and then proceeded with a 20-minute PowerPoint presentation summarizing the background and purpose of the Cool Creek Watershed Management Plan. The presentation included a summary of the findings, alternatives, and recommended solutions. Following the presentation the interview was opened for general discussion and questions/answers. The following summarizes the key points that were discussed:

- Kurt Wanninger (Public Works) addressed the issue of construction in the floodplain. Does Hamilton County have a regulation regarding this? Hans Peterson stated that Hamilton County has adopted a very restrictive ordinance for construction in the floodplain, with the intent of discouraging floodplain construction whenever possible. Construction in the floodplain is not allowed, unless a variance is granted. Any variance will come with the requirement that floodplain area must be replaced at a 10:1 compensatory ratio.
- Mr. Wanninger noted that Westfield will likely adopt a similar floodplain ordinance.
- Mr. Wanninger noted that the County plans to replace the 186th Street culvert at Grassy Branch, but that this may be delayed due to funding.
- Westfield has plans for recreational trails along Cool Creek near the new school.
- Mr. Wanninger stated that there is a lot of Beaver activity along Grassy Branch. They have been working with the County to eradicate this problem.
- Mr. Peterson asked if there are any major developments pending. Mr. Wanninger stated that the only major development pending at this time is the Sycamore Development.

Meeting Minutes

Cool Creek Watershed Management Plan

6/20/05

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- Mr. Wanninger questioned whether the elevated nutrient levels found during the Cool Creek stream sampling program could possibly be caused by overflow from the holding basins on the Heartland Growers property.
- Mr. Wanninger stated that there are four neighborhoods that are still on septic systems, and that some systems in each of these areas are failing. They are Far Hills (161st and U.S. 31), Buena Vista (156th Street and U.S. 31), Ridgewood (161st Street and Oakridge Road), Bokeelia (191st Street and Tomlinson Road), and Brookview Place (191st Street and Flippins Road). Westfield intends to connect these homes to the public sewer system as soon as feasible. Barrett Law funding may be utilized.
- The Town is interested in constructing recreational trails along Cool Creek and its tributaries. Mr. Wanninger asked if this is something that may be fundable through a Section 319 grant. Mr. Peterson stated that it is unlikely that this activity would be eligible unless it could somehow be tied to nonpoint source stormwater pollution reduction efforts.
- In summary, Mr. Wanninger stated that the Town has the following priorities regarding potential improvements in the Cool Creek Watershed:
 - 1) Replace bridges and upgrade roads to reduce floodwater overtopping.
 - 2) Replace undersized culverts
 - 3) Construct regional detention facilities to reduce peak downstream flows and to improve water quality
 - 4) Replace failing septic systems

Interview Workshop Town of Westfield



City of Carmel



Town of Westfield



Hamilton County



Cool Creek Watershed Management Plan
Section 319 Grant
June 20, 2005



Agenda

- Introductions
- Cool Creek Watershed Overview
- Previous Planning Efforts
- IDEM Section 319 Grant Components
- Discussion of Problem Areas
- Discussion of Implementation Priorities
- Closing / Follow Up



Cool Creek Watershed Overview

- Drainage Area ~ 23.7 mi.²
- From 199th Street to White River, near 116th Street
- Large Portions of Westfield and Carmel and parts of unincorporated Hamilton County
- Lower watershed mostly developed, upper watershed experiencing rapid growth

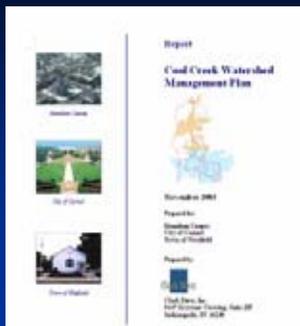


Cool Creek Watershed Overview

- Approximately 15 miles of watercourse
- Approximately 50 to 60 percent urbanized
- Impervious area estimate:
 - Urbanized Areas 40 – 50 %
 - Overall watershed 20 – 30 %



Previous Cool Creek Planning Efforts



Purpose of Previous Planning Efforts (2003 Plan)

- Address Existing Stormwater Flooding Problems
- Prevent Future Problems as the Watershed Continues to Develop
- Compliance with New Federal Regulations Governing Stormwater Quality



Scope of the Previous Study

- Inventory and Problem Identification
- Problem Analysis
- Solution Development
- Recommendations

Inventory & Problem Identification

Map & Plans

- GIS
- USGS
- National Wetland Inventory
- Flood Insurance Rate
- Zoning Maps
- Aerial Photographs



<http://www.co.hamilton.in.us/gis/start.html>

Inventory & Problem Identification

Previous Reports & Studies

- IDNR Memorandum – Grassy Branch
- Hydraulic Report for Village Farms Wilfong
- Countryside Overall System Drainage Report
- Soil Survey of Hamilton County, Indiana
- FEMA Flood Insurance Study
- US 31 Improvement Project documents

Inventory & Problem Identification

Ordinances & Standards

- Consistent Stormwater Management Controls.
- Detention Facility Requirements.
- Downstream Channel Protection.
- Water Quality Enhancement.
- Prohibition on Development in Floodplains.

Inventory & Problem Identification

Public Input

- Public Meetings
- Developer Input
- Interviews with:
 - Local Staff
 - Citizens



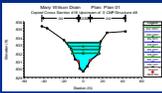
Problem Analysis

- Water Quantity Evaluation
 - Hydrologic/hydraulic modeling
 - Impacts of future development
- Water Quality Evaluation
 - Sampling
 - Existing conditions
 - Policies impacting future conditions

Problem Analysis

Hydrologic/Hydraulic Analysis

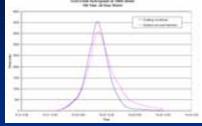
- Assess the volume and rate of runoff for various storm events
- Evaluate existing stormwater conveyance and storage facilities
- Evaluate stormwater runoff impacts from future development
- Determine appropriate control measures

Problem Analysis

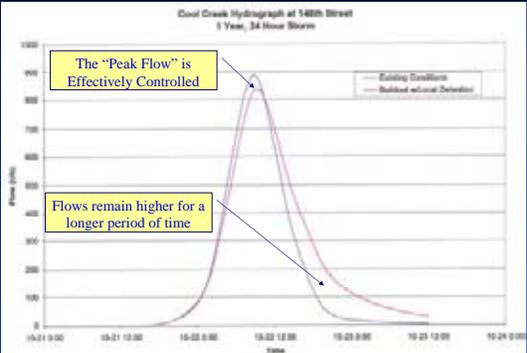
Effects of Urbanization

- Higher peak flows as a result of urbanization
- County detention policy is effective in controlling peak flows
- Longer flow durations
- More frequent "bank-full" conditions tend to exacerbate erosion




Problem Analysis

Effects of Urbanization



Problem Analysis

Hydraulic Evaluation

Conveyance Problems in the Upper Reaches of Cool Creek and its Immediate Tributaries

Examples



Inadequate bridge – 171st St. over Cool Creek



Culverts filled with sediment – Walter Street and Walter Court



Inadequate culverts – Carmel Drive over Hot Lick Creek

Problem Analysis

Stream Channel Evaluation



Severe erosion along lower reach of Cool Creek



Floodplain encroachments constrict flow and increases downstream erosion

Stream Information Compiled on Inventory Maps

Problem Analysis

Water Quality Evaluation

Entailed:

- Review of the Riparian Corridor
- Assessment of Floodplain Development
- Water Quality Sampling



Problem Analysis

Riparian Corridor

Protects Water Quality and Preserves Stream's Natural Characteristics



Forested Riparian Buffer along Cool Creek East of S. R. 431



No Riparian Buffer – Cool Creek South of 19th Street

Problem Analysis

Floodplain Development

Prohibit development in floodplain to help preserve existing buffers and natural flood storage



Problem Analysis

Water Quality Sampling Locations



- 186th Street
- 146th Street
- 116th Street

Problem Analysis

Water Quality Sampling Conclusions

- Pollutant constituents and concentrations in Cool Creek – generally comparable to other urban streams across country
- Nutrients levels somewhat high, possibly from excess fertilizer
- Bacteria levels exceed standards for recreational contact during wet weather (*problem is common to nearly all urban watersheds*)
- Stormwater Best Management Practices will help improve water quality

Solution Development

- Stream Flooding/Road Overtopping Solutions
- Neighborhood Problem Solutions
- Stream Bank Erosion Solutions
- Regional Stormwater Detention
- Future Land Use & Planning Recommendations

Solution Development

Streambank Flooding/Road Topping Solutions

- Replace 171st Street Bridge and Regrade Roadway
- Regrade Roadway at 151st Street bridge
- Replace Gurley Street bridge (Anna Kendall Drain)
- Replace Cherry Street bridge (Anna Kendall Drain)



Solution Development

Streambank Flooding/Road Topping Solutions

- Replace SR 32 Culvert (J.M. Thompson Drain)
- Replace Culvert Downstream of US 31 (Highway Run)
- Add Culvert to US 31 (Highway Run)
- Replace Walter Street and Walter Court Culverts (Highway Run)
- Replace Private Drive Culvert between Walter Street and Walter Court (Highway Run)
- Replace Thornberry Drive Culvert (Highway Run)
- Replace Carmel Drive Culvert (Hot Lick Creek)



Solution Development

Streambank Erosion Solutions

Restoration Projects at:

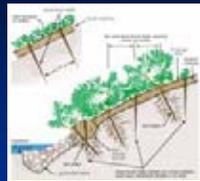
- Highway Run –
 - Downstream of Stonehedge Drive
- H.G. Kenyon Drain –
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- Cool Creek –
 - Upstream of confluence with the White River,
 - Downstream of Gray Road (at bend),
 - Upstream and downstream of Hot Lick Creek
 - Upstream of 131st Street (Main Street) and
 - Upstream of Keystone Avenue



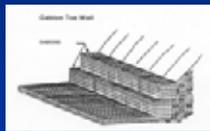
Streambank Stabilization Techniques



Riprap and Live Stakes (Joint Plantings)
Source: Federal Interagency Stream Restoration Working Group, 1998



Brushmattress Technique (Source: USDA-NRCS 1996)

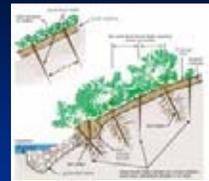


Source: Chattanooga Public Works Department

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Cool Creek Demonstration Project (Hamilton County SWCD)



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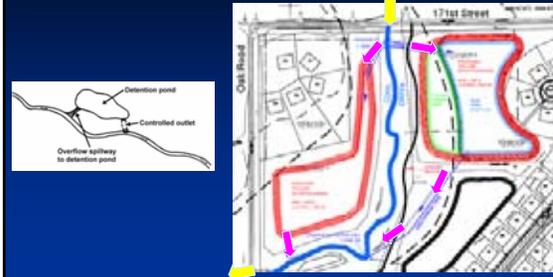
Solution Development

Regional Stormwater Detention

- Two (2) off-line Regional Detention Basins to Control the Magnitude of Stormwater Flows and Reduce downstream channel erosion
 - Immediately Downstream of 171st Street
 - West of Grassy Branch Road
- Retrofit existing regional on-line detention provided by RR embankment on Anna Kendall Drain

Solution Development

Regional Stormwater Detention



171st Street Regional Detention



Solution Development

Land Use Planning Recommendations

- **Detention Requirements**
Improve control of smaller storms (first flush)
- **Stream Buffer Ordinance**
Grass filter strips, preservation
- **Floodplain Protection**
Prohibit fill in the floodplain
- **Other Best Management Practices**
Improve water quality

Recommendations

Cost of Improvements

Stream Flooding/ Roadway Overtopping Solutions -	\$2,720,000
Neighborhood Solutions -	\$100,000
Streambank Erosion Solutions -	\$570,000
Regional Detention Solutions -	\$5,100,000
Total of All Solutions -	\$8,490,000

IDEM 319 Plan Updates

- Two Public Hearings
- Quarterly Steering Committee Meetings
- Carmel, Westfield, and Hamilton County Interviews
- Quarterly Newspaper Articles
- Written Plan (updates to current Cool Creek Report)

Additional Problems/Concerns

- Critical Areas to Protect
- Agricultural Impacts
- Additional Streambank Erosion Areas
- Specific Development Concerns
- Flooding Concerns
- Ordinance deficiencies
- Opportunities for other regional solutions

Implementation Priorities

High	Med	Low	Improvement
			Repair Eroded Streambanks
			Solve flooding problems
			Construction Regional Off-Line Water Quality Pond(s)
			Implement Stream Buffer and/or Prohibit Floodplain Fill Ordinance
			Improve controls on new development
			Preserve Open Space/Sensitive Areas
			Improve Agricultural BMPs



CARMEL INTERVIEWS

AGENDA

Carmel Interview Workshop

Cool Creek Watershed Management Plan Hamilton County, Indiana

June 20, 2005 – 2:00 p.m. – 4:00 p.m.

1. Introductions and Sign-in
2. Cool Creek Watershed Overview
3. Previous Cool Creek Watershed Planning Efforts
4. IDEM Section 319 Watershed Management Plan Components
5. Discussion of Problem Areas
6. Discussion of Implementation Priorities
7. Closing and Follow Up Action Items

SIGN IN SHEET

Carmel Interview Workshop

Cool Creek Watershed Management Plan
Hamilton County, Indiana

June 20, 2005

2:00 p.m. - 4:00 p.m.

Name	Department/Area of Responsibility	Telephone	E-mail
Hans Peterson	Clark Dietz, Inc, Proj Mgr	(317) 582-0300	hansp@clark-dietz.com
Doug Valmore	Clark Dietz, Proj Eng	(317) 582-0300	doug.v@clark-dietz.com
Mark Weitermeier	Parks	317 571 2485	MWETTERMEIER@CARMEL.IN.GOV
David Lovell	STREET	317) 733-2001	DLovell@ci.carmel.in.gov
David HUFFMAN	STREET	317) 733-2001	DHUFFMAN@ci.carmel.in.gov
Amanda Riley	Eng.	317-571-2441	ariley@ci.carmel.in.gov
Argonne Kachig	Parks	317-571-2417	argonne@carmel.in.gov
Jeff Goodell	Building & Comm	317-571-2435	JeffGoodell@carmel.in.gov
MIKE McBRIDE	ENGINEERING	317-571-2441	MICBRIDE@CARMEL.IN.GOV
SCOTT BREWER	POCS-URBAN FORESTRY	317-571-2478	SBREWER@CARMEL.IN.GOV



MEETING SUMMARY CARMEL STAFF INTERVIEWS

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- Mr. Westermeier (Parks Department) asked what the regulatory requirements or construction guidance is applicable for streambank stabilization. Mr. Peterson stated that the Indiana Erosion Control Handbook is a valuable source of information regarding approved methods of stabilization. He also stated that the Indiana Department of Natural Resources has regulatory authority over any projects that occur along a waterway with a square mile or greater drainage area upstream of the improvement location. We also discussed the pilot streambank stabilization projects constructed in Cool Creek by the Hamilton County SWCD. They would also be a good resource on streambank stabilization techniques.
- Mr. McBride (Carmel City Engineer) asked how new the Hamilton County floodplain restrictions are. Mr. Peterson stated that they have been implemented for approximately one or two years.
- Carmel is interested in adopting a similar floodplain ordinance.
- Carmel has initiated Rule 13 activities (ordinances, staffing, etc.). They are not complete at this time.
- Mr. Peterson asked if there are any septic systems within the community. Mr. McBride stated that there are very few, and the ones that remain are scattered. There is no initiative to remove the remaining isolated septic systems at this time as they are not believed to be a source of pollution.

Meeting Minutes

Cool Creek Watershed Management Plan

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- Carmel plans to take over erosion and sediment control responsibilities from the Hamilton County SWCD. However, at this time the program is not very effective, due to lack of available staff and lack of enforcement authority.
- Mr. McBride stated that most of the City's stormwater complaints are related to local flooding. The next most frequent complaint is for streambank erosion.
- Mr. McBride stated that the City has been increasingly required to perform stream mitigation to compensate for impacts from road projects.
- Mr. Westermeier stated that the most severe streambank erosion problem in the City occurs along Cool Creek at Flowing Well Park (north of 116th Street). He stated that the streambank has been eroding in this area as much as two feet per year. This is a high priority for the City.

Interview Workshop City of Carmel



City of Carmel



Town of Westfield



Hamilton County



Cool Creek Watershed Management Plan
Section 319 Grant
June 20, 2005



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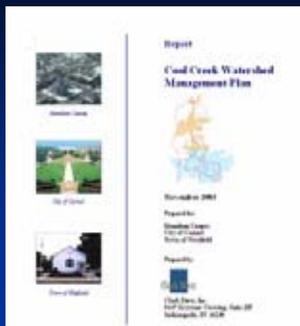


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Inventory & Problem Identification

Public Input

- Public Meetings
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- Interviews with:
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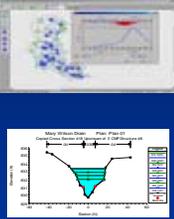
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- Water Quantity Evaluation
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 - Sampling
 - Existing conditions
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Problem Analysis

Hydrologic/Hydraulic Analysis

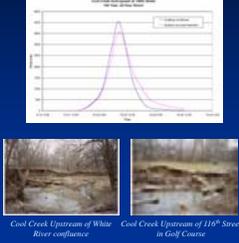
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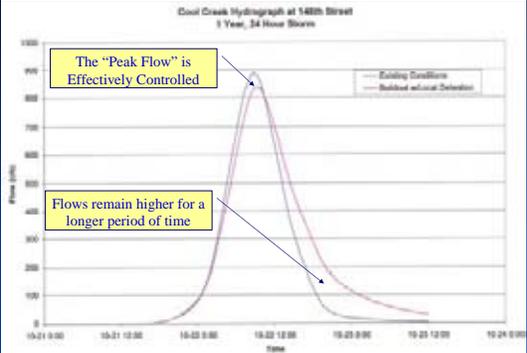
Effects of Urbanization

- Higher peak flows as a result of urbanization
- County detention policy is effective in controlling peak flows
- Longer flow durations
- More frequent "bank-full" conditions tend to exacerbate erosion



Problem Analysis

Effects of Urbanization



The "Peak Flow" is Effectively Controlled

Flows remain higher for a longer period of time

Problem Analysis

Hydraulic Evaluation

Conveyance Problems in the Upper Reaches of Cool Creek and its Immediate Tributaries

Examples



Inadequate bridge – 171st St. over Cool Creek

Culverts filled with sediment – Walter Street and Walter Court

Inadequate culverts – Carmel Drive over Hot Lick Creek

Problem Analysis

Stream Channel Evaluation



Severe erosion along lower reach of Cool Creek

Floodplain encroachments constrict flow and increases downstream erosion

Stream Information Compiled on Inventory Maps

Problem Analysis

Water Quality Evaluation

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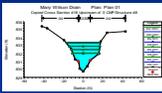
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Hydrologic/Hydraulic Analysis

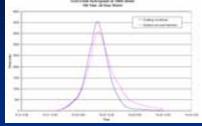
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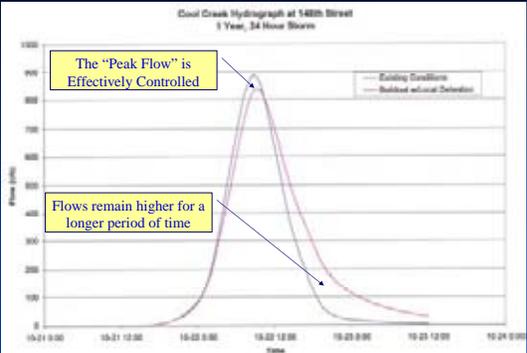
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Problem Analysis

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Problem Analysis

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Problem Analysis

Riparian Corridor

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Problem Analysis

Floodplain Development

Prohibit development in floodplain to help preserve existing buffers and natural flood storage



Problem Analysis

Water Quality Sampling Locations



- 186th Street
- 146th Street
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Solution Development

- Stream Flooding/Road Overtopping Solutions
- Neighborhood Problem Solutions
- Stream Bank Erosion Solutions
- Regional Stormwater Detention
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Solution Development

Streambank Flooding/Road Topping Solutions

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Solution Development

Streambank Flooding/Road Topping Solutions

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- Replace Thornberry Drive Culvert (Highway Run)
- Replace Carmel Drive Culvert (Hot Lick Creek)



Solution Development

Streambank Erosion Solutions

Restoration Projects at:

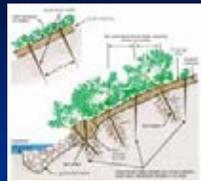
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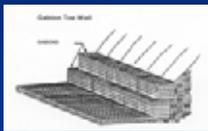
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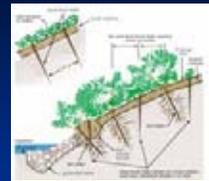


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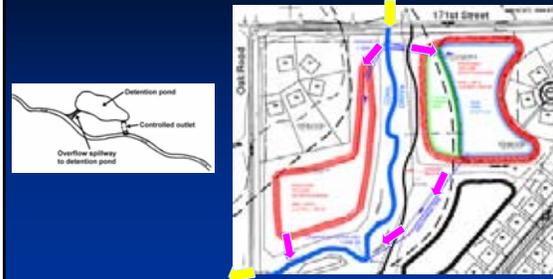
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 - Immediately Downstream of 171st Street
 - West of Grassy Branch Road
- Retrofit existing regional on-line detention provided by RR embankment on Anna Kendall Drain

Solution Development

Regional Stormwater Detention



171st Street Regional Detention



Solution Development

Land Use Planning Recommendations

- **Detention Requirements**
Improve control of smaller storms (first flush)
- **Stream Buffer Ordinance**
Grass filter strips, preservation
- **Floodplain Protection**
Prohibit fill in the floodplain
- **Other Best Management Practices**
Improve water quality

Recommendations

Cost of Improvements

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Neighborhood Solutions -	\$100,000
Streambank Erosion Solutions -	\$570,000
Regional Detention Solutions -	\$5,100,000
Total of All Solutions -	\$8,490,000

IDEM 319 Plan Updates

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- Carmel, Westfield, and Hamilton County Interviews
- Quarterly Newspaper Articles
- Written Plan (updates to current Cool Creek Report)

Additional Problems/Concerns

- Critical Areas to Protect
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- Specific Development Concerns
- Flooding Concerns
- Ordinance deficiencies
- Opportunities for other regional solutions

Implementation Priorities

High	Med	Low	Improvement
			Repair Eroded Streambanks
			Solve flooding problems
			Construction Regional Off-Line Water Quality Pond(s)
			Implement Stream Buffer and/or Prohibit Floodplain Fill Ordinance
			Improve controls on new development
			Preserve Open Space/Sensitive Areas
			Improve Agricultural BMPs

