



STRAND
ASSOCIATES®

Excellence in Engineering Since 1946

Strand Associates, Inc.® (SAI)

Nationally Recognized Expertise Delivers A Comprehensive Stormwater Management Study

Village of Winnetka, IL





Provides Confidence in Sound Stormwater and Flood Control Decision-Making

- Depth of Experience Provides Certainty in the Viability and Value of Selected Stormwater Initiatives
- Proven Approach “Leaves No Rock Unturned” in Identifying Holistic, Innovative Stormwater Planning Alternatives
- Proposed Team has Demonstrated Ability to Identify Planning Level Solutions that are Implementable, Constructible, and Cost-effective
- Inclusionary Approach to Public Engagement Provides the Foundation for a Community-Supported Solution

All Attention is Now on the Results of this Pivotal Stormwater Management Study



February 21st: Contract Awarded to Baird for Willow Rd. Tunnel Outfall Design

February 21st: Contract Awarded to Strand for Sanitary Sewer Evaluation

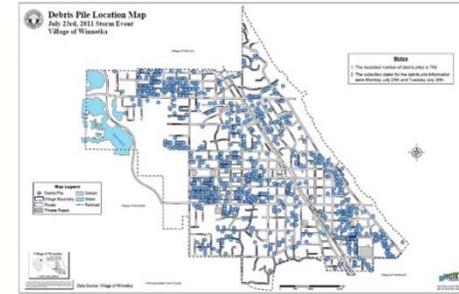
May 10th: Contract Awarded to AT Group Stormwater Manager

May 10th: Meeting with Regulators

June 12th: Contract Awarded to Baxter & Woodman for Stormwater MP

September 11th: Contract Awarded to Kenny Construction for Tunnel Project Costs

November 13th: Village Council Meet with MFSG to Develop Project Financial Plan



January 21st: Contract Awarded to MWH for Tunnel Design & Permitting

June 18th: MWH Submits Review Point #1 Summary

2011

July 22nd: Significant Storm

August 2nd: Tunnel Proposed as a Solution

September 13th: Ammendment to Village Code - Sanitary Sewer Backflow Prevention

October 5th: Flood Risk Reduction Assessment

October 11th: Village Council Meeting - Continue Tunnel Exploration

November 15th: Contract Awarded to TSC for SUBsurface Investigation

2012



2013

March 15th: Sewer Back-Up Program Discontinued

July 31st: RFQ Published for Tunnel Project

October 23rd: RFP Published for Tunnel Project



2014

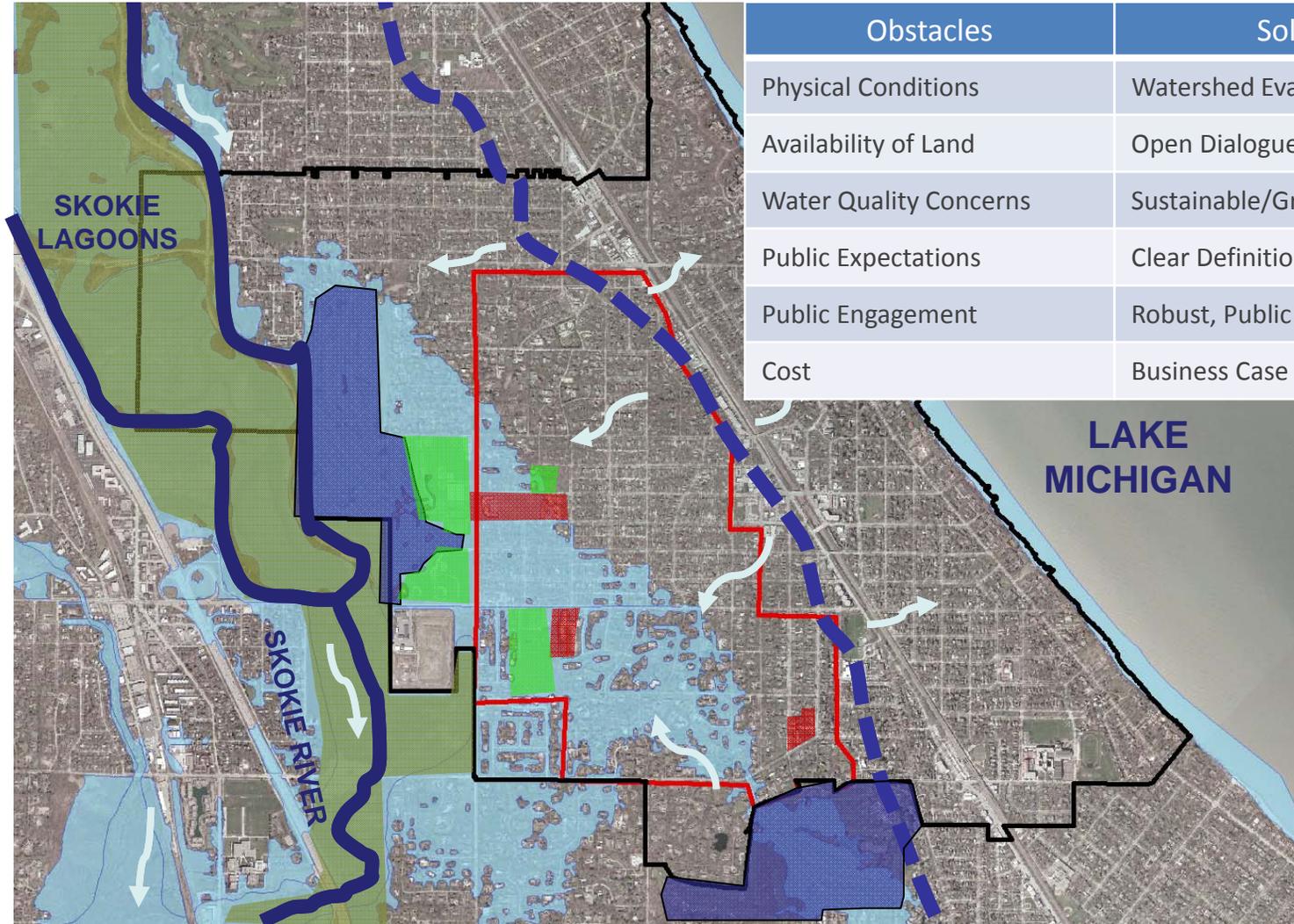
April 28th: MWH Submits Review Point #2 Summary

June 2nd: Contract Awarded to V3 Companies for Cost Evaluation and VE

June 2nd: Village Council Meeting- Proceed with Permit Applications but Not Design

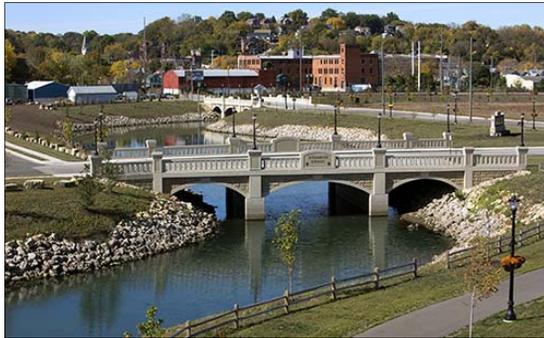
2015

SA Is Equipped to Tackle the Potential Obstacles to a Successful Stormwater Management Study



Obstacles	Solutions
Physical Conditions	Watershed Evaluation
Availability of Land	Open Dialogue
Water Quality Concerns	Sustainable/Green Infrastructure
Public Expectations	Clear Definition of Success
Public Engagement	Robust, Public Participation
Cost	Business Case Evaluation

Regional Presence Offers a Stormwater Perspective Not Experienced in the Chicagoland Area

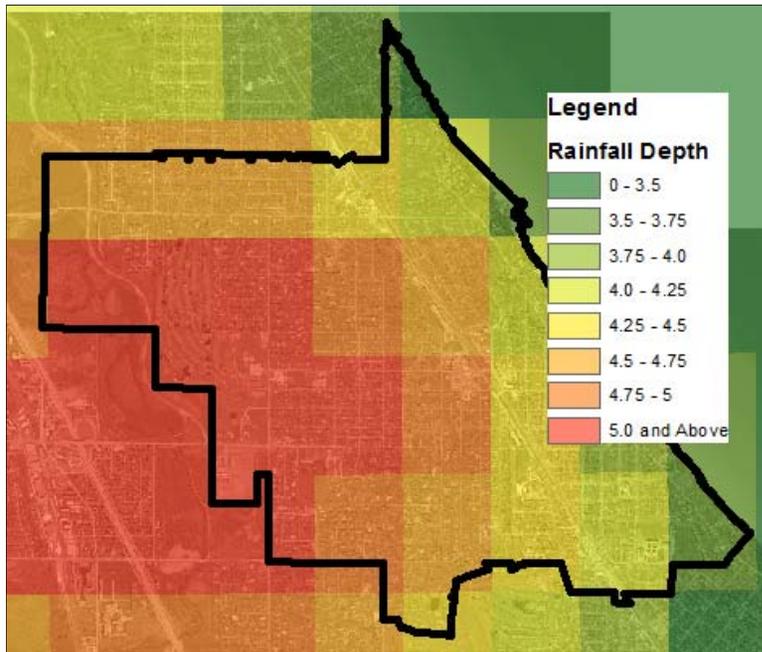


Technical Stormwater Expertise Results in Cost-Effective Stormwater and Flood Control Solutions

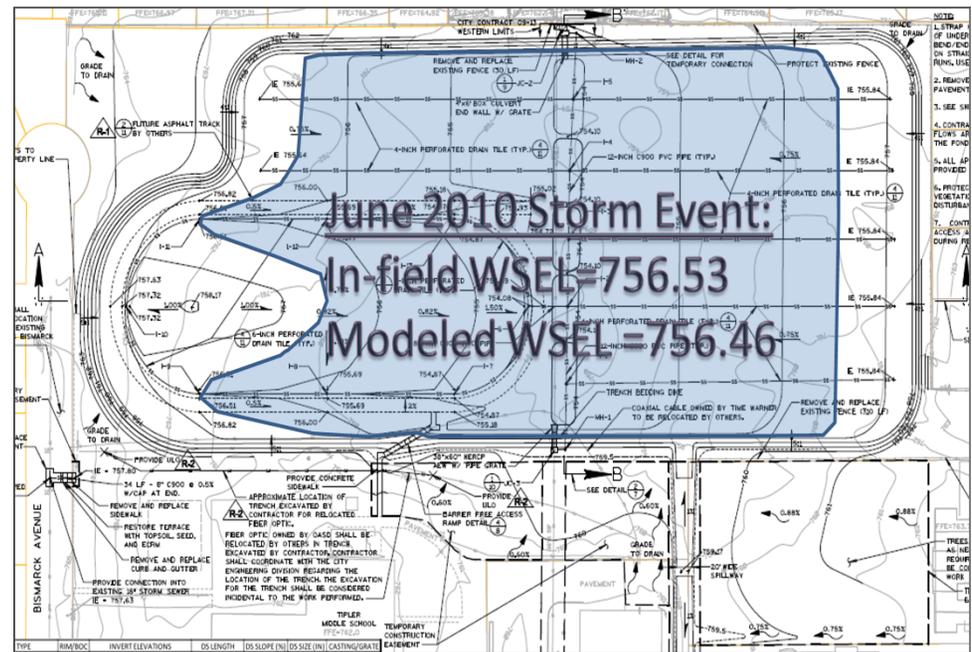
- Data Collection and Review Brings Fresh Perspective While Leveraging Past Investments
- State-of-the-Art XP-SWMM 2D Modeling Platform Provides Accurate and Illustrative Results
- Modeling Results of Alternative Stormwater Controls Demonstrates Flood Control Performance



Stormwater Model Calibration and Validation Techniques Provide Reliable Foundation for Sizing of Improvements



NEXRAD Imagery of the July 2011 Event Over Winnetka



Tipler Detention Basin Model Validation, Oshkosh, WI

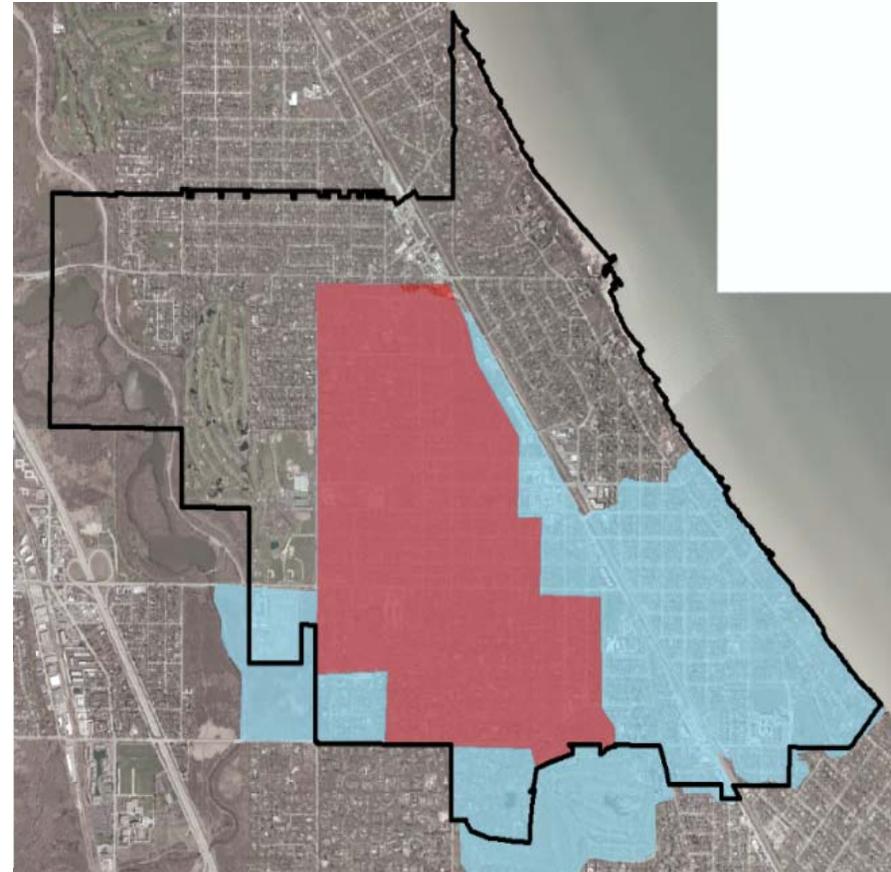
Proven Approach Leaves No Rock Unturned in Identifying Holistic, Innovative Stormwater Planning Alternatives



Our Process Asks Questions that Others Don't: Comprehensive Inventory and Analysis

- Look Beyond Study Area
- Consider Partnerships
 - Schools
 - Golf Courses
 - Forest Preserve
 - Winnetka Park District
- Use Common Sense

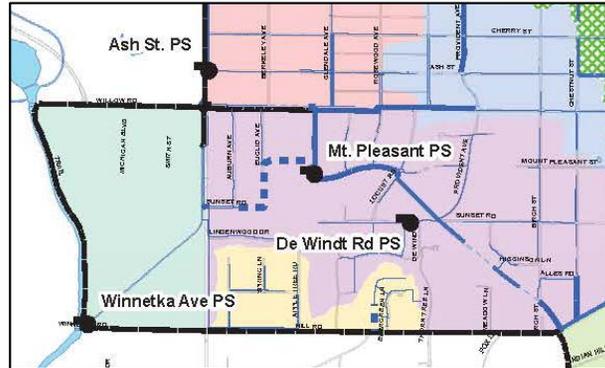
GREY | GREEN
INFRASTRUCTURE



Comparison of study area (RED), STADI drainage area (BLUE) and village boundary (BLACK).

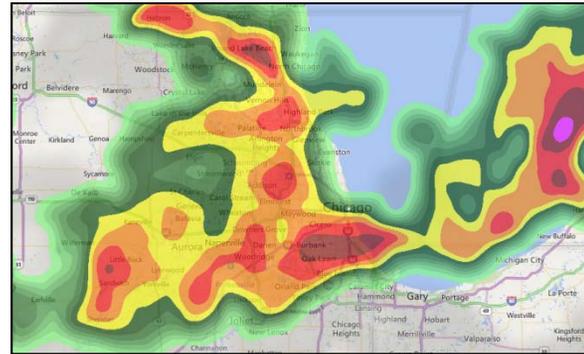
Alternatives Evaluation: Traditional Solutions

- Wet Detention/Retention
- Dry Detentions
- Underground Storage
- Pump/Lift Stations
- Surface/Roadway Storage
- Maximizing Existing Infrastructure
- Storm Sewer Upgrades
- Tunneling



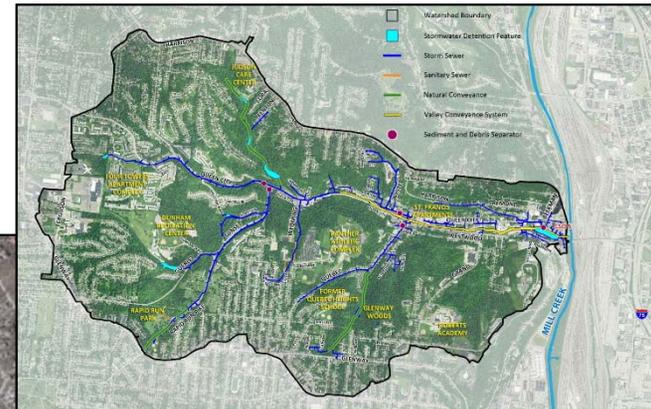
Alternatives Evaluation: Innovative Solutions

- Predictive Detention Storage
- Enhancement of Surface Drainage
- Managing Water Levels in Skokie Lagoons
- Modifications to the Willow Road Dam (FPD Study)

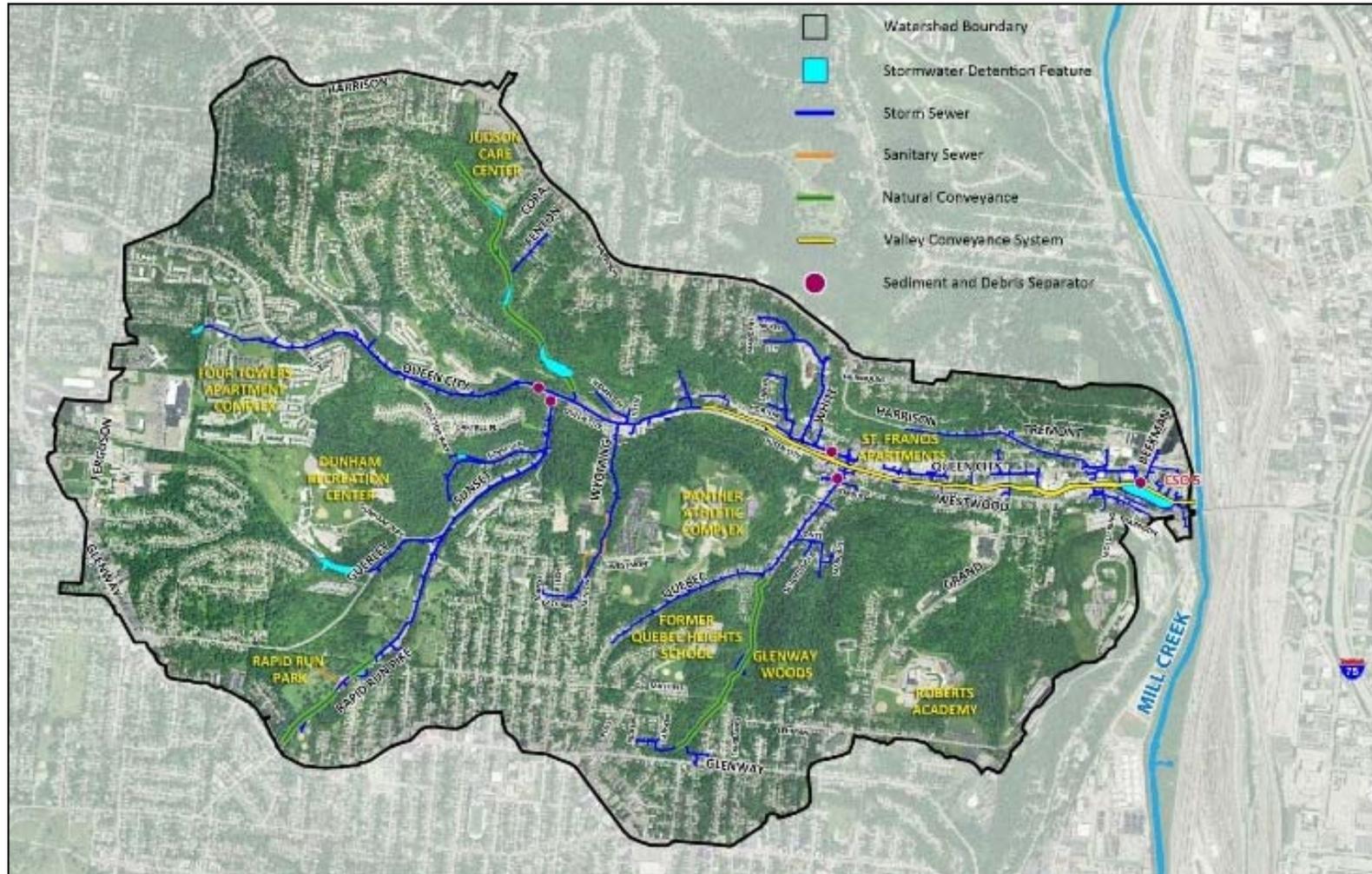


Alternatives Evaluation: Innovative Solutions

- Collaboration with Entities Outside Village
- Watershed-Based Green Infrastructure
- Stormwater Management Within the ROW

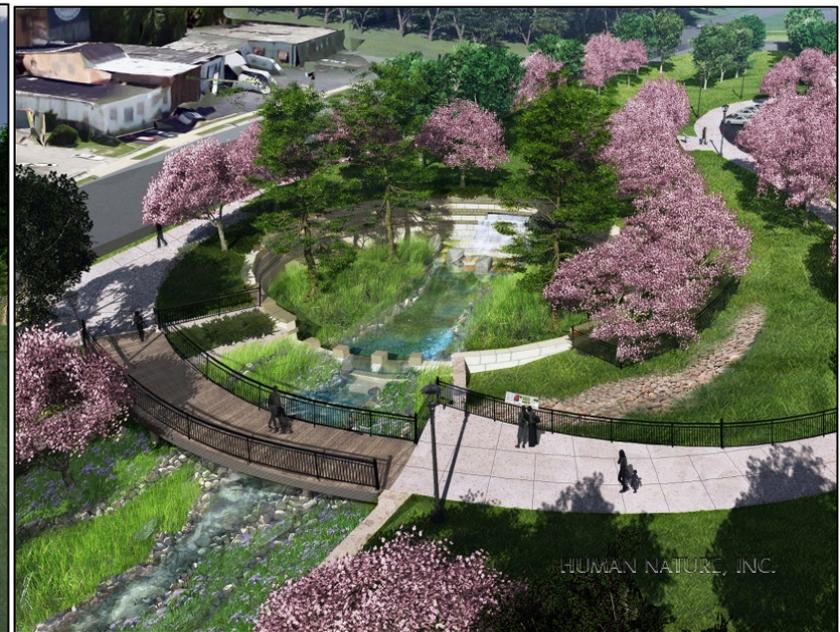


Case Study: Lick Run Watershed-Based Green



Case Study: Lick Run Watershed-Based Green

- Saved \$200 Million Compared to Planned Tunnel Costs
- 100-year Flood Control
- Community Revitalization
- Property Buyout
- Gray/Green Solution



Case Study: Detention within the Right-Of-Way



KYTC detention basin retrofit within the ROW controls the PMP storm event, which is larger than the 100 year event.



Terraced Reforestation project won a national engineering award for its innovative stormwater management.



Neighborhood Green Infrastructure program provided stormwater runoff reduction and water quality improvements at 28 urban intersections in Aurora, IL.

Case Study: Rapid Run Watershed - Severe Residential Flooding

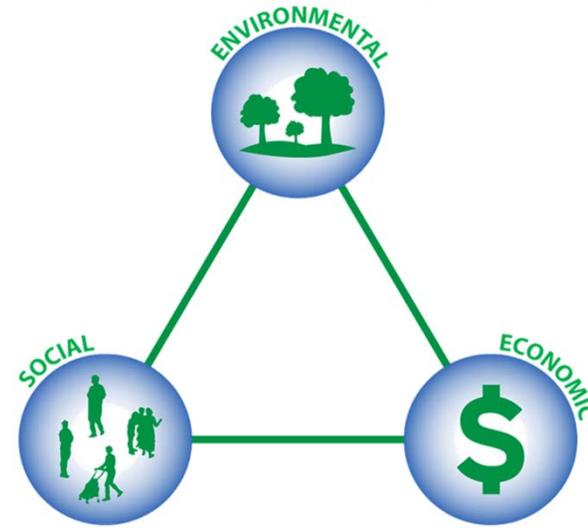
- FEMA Hazard Mitigation Grant
- Detention Basin Retrofits
- 100-year Flood Control
- Conveyance Channel
- Green and Gray Infrastructure
- Controls in the ROW



“Business Case” Evaluation Drives Alternatives

- Cost-Benefit Evaluations
 - Cost per Gallon
- Triple Bottom Line Evaluations
 - Social
 - Environmental
 - Economical
- Life Cycle Cost Evaluations
 - Program Duration
 - Annual O&M

Strategic Storm Sewer Separation Storm
Detention Reforestation Downspout
Disconnection Stream Daylighting Clean
Water Reduced CSOs Water as a Resource



Sense of Place Recreational Amenities
Civic Spaces Reinvestment in the Urban
Core Community Redevelopment
Greenway Connections

Neighborhood Redevelopment
Sustainable Infrastructure Job Creation
Leveraged Infrastructure Investment
Adaptive Reuse



Construction Cost Control Strategies and Tools

- Constructability Reviews
- Risk Register Analysis
- Review of Recent Bid Tabs/Unit Prices
- Inclusion of Contingency/Allowances
- Value Engineering
- QA/QC Process

QA/QC Process Record Form Strand Associates, Inc.			
Project Number	Project Name	Work Product Description	
PID 11240000	LICK RUN VALLEY CONVEYANCE SYSTEM	Design Drawings <input checked="" type="checkbox"/> Calculations <input type="checkbox"/>	Specifications <input type="checkbox"/> Modeling <input type="checkbox"/>
Review of sub consultant submittal? Y (N) (circle one)		Report <input type="checkbox"/> Other: _____ <input type="checkbox"/>	
QA/QC Task		Initials	Date
1a. Originator ¹ reviews work product prior to submittal to Checker.		JCH	RD 1 7/11/14 RD 2 7/31/14
1b. Originator ¹ submits work product to Checker ² and CAD Manager for review.		JCH	RD 1 7/14/14 RD 2 8/1/14
2. Checker ² reviews submittal and makes corrections in red.		LRH	RD 1 7/22/14 RD 2 8/6/14
3. CAD Manager reviews submittal and makes corrections in red.		CAK	RD 1 7/22/14 RD 2 7/28/14
4. Back Checker ¹ reviews corrections identified by Checker and CAD Manager.		JCH	RD 1 7/23/14 RD 2 8/8/14
5. Originator/Checker/CAD Manager concurrence meeting. ³		JCH/LRH	7/22/14
6. Corrector ¹ incorporates red markups and highlights addressed markups in yellow. ³		JCH	RD 1 7/28/14 RD 2 8/8/14
7. Verifier ² verifies corrections were made and highlights in green or re-marks in red.		LRH	8/4/14
8a. Originator submits QC documents to QA manager for review.		JCH	8/8/14
8b. QA Manager verifies QC procedures were followed.		CMW	8/14/14
9. PM verifies QA/QC plan was implemented.			

Notes:
 1) Originator may also function as the Back Checker and Corrector. Originator completes steps 1, 3, and 4.
 2) Checker may also function as the Verifier. Checker completes steps 2, 3, and 5.
 3) Repeat steps 5 and 6 and add additional rows to the table as necessary.
 4) If sub consultant submittal is being reviewed, the sub consultant is considered the Originator, Back Checker, and Corrector.

Quality Control Staff

Role	Name	Role	Name
Originator:	Jeff Heimann	Verifier:	Luke Holman
Checker:	Luke Holman	QA Manager:	Cathy Wunderlich
CAD Manager:	Chad Kopecky	Project Manager:	Tom Brankamp
Back Checker:	Jeff Heimann		

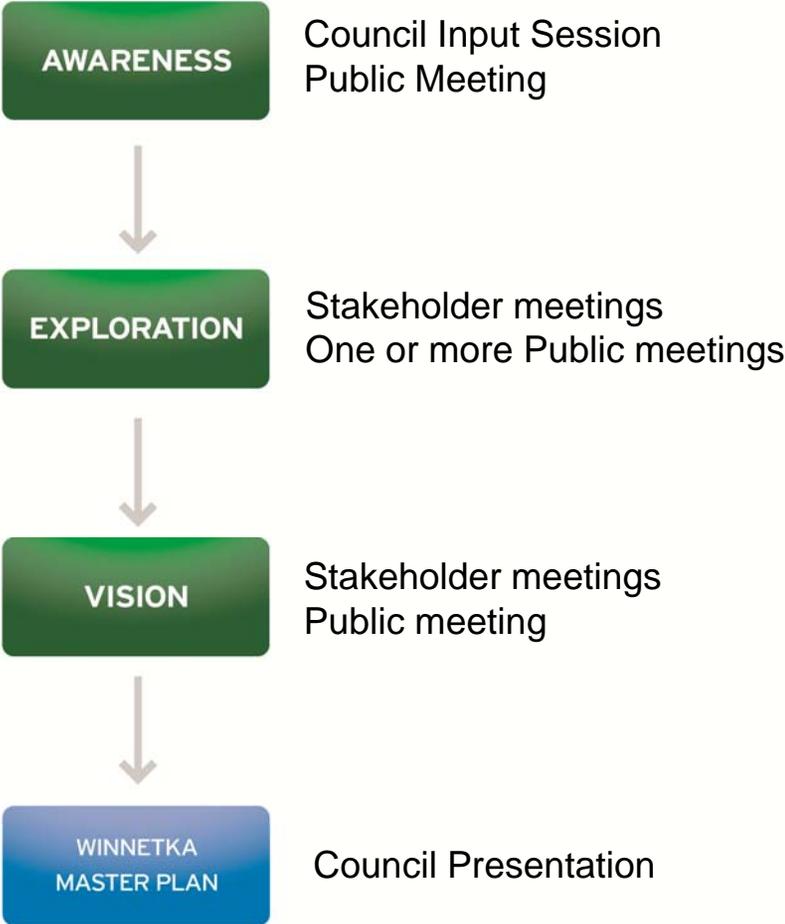
IDENTIFICATION					ASSESSMENT				RESPONSE			REPORTING			
ID	RISK	CAUSE OF RISK	CATEGORY	SUB-CATEGORY	CONSEQUENCES	CONSEQUENCE RATING	LIKELIHOOD OF OCCURRENCE RATING	RISK SCORE	RISK CLASS	RISK RESPONSE PLAN	ASSIGNED RISK	DUE DATE	RESOLVED ON	STATUS	ACTIONS TAKEN
33	Delay of approval of drilling and sampling program and requests for additional soil borings by CDOTE.	Inherent uncertainties in the soil conditions and the CDOTE boring location requirement.	Management	Governance	Delays in detailed project design; use of contingency geotechnical budget.	2	2	4	Very Low	Provide preliminary drilling and sampling plan indicating proposed locations to CDOTE early on in the design process.	Consultant/MSD	June 1, 2014	TBD	Active	
34	Delay/inability in securing approval of rail corridor crossing at Mill Creek outfall.	Difficulty in contacting and coordinating with FR owner(s); change in FR ownership.	Management	Mitigation/Permit Compliance	Intensive review comments, extensions to review periods, and additional public comment requirements may delay project implementation, construction start up; Delayed FR approval could delay start of project. Inability to secure FR approval could prevent project from moving forward.	10	4	40	High	Communicate with FR owner early in the design phase to inform FR owner of project details and obtain FR design requirements. Cooperate with FR owner. Submit preliminary drawings for comment as soon as available.	Consultant/MSD	June 1, 2014	TBD	Active	

Our Inclusionary Approach to Public Engagement Provides the Foundation for Community Supported Solutions

- Traditional Engineering approach
Decide – Announce – Defend
- Our Inclusionary Process
 - Listen
 - Inform
 - Educate
 - Utilize Input
 - Explore Alternatives
 - Build consensus
 - Supported Vision



A Robust Program For Stakeholder Input Effectively Engages, Informs, and Builds Consensus



Lick Run Case Study



August 2011
Visual Preference Survey



October 2011
**Strengths & Weaknesses
of Alternatives & Concepts**



February 2012
Identify Gaps & Refinements

Exploration Phase

- Explore spectrum of Alternatives
- Varying degree of Impact and Cost
- Solicit Public Input
 - Strengths and Weaknesses
 - Cost implications
- Meet with Stakeholders
- Multiple meetings in this phase

WHAT ARE POTENTIAL CONCEPTS

Defining a source control solution for Lick Run is a complex process, but with community input this approach may provide long-term, sustainable benefits and the potential for community amenities.

1. Underground Storm Sewers with Open Space

- Series of large separate storm sewers underground
- Restricted use of open space because of underground sewer infrastructure

Traditional Approach: Limited Water Quality Benefits

2. Uniform Surface Channel

- Aboveground channel
- Uniform shape and made of concrete
- Retaining walls and fencing for public safety

Traditional Approach: Limited Water Quality Benefits

3. Natural Stream with Underground Storm Sewers

- Surface natural stream channel and separate storm sewers
- Flows into separate underground storm conveyance to Mill Creek

Leveraged Approach: CSO Solution as Community Amenity

4. Natural Stream with Water Quality Feature

- Aboveground natural stream channel and separate storm sewers
- Water quality feature linked to natural stream channel and Mill Creek
- Leveraged community investments from other sources

Leveraged Approach: CSO Solution as Community Amenity

5. Natural Stream with Water Quality Feature & Roadway Improvements

- Aboveground natural stream channel and separate storm sewers
- Water quality feature linked to natural stream channel and Mill Creek
- Roadway improvements on Westwood and Queen City

Leveraged Approach: CSO Solution as Community Amenity

Who Chooses the Solution?

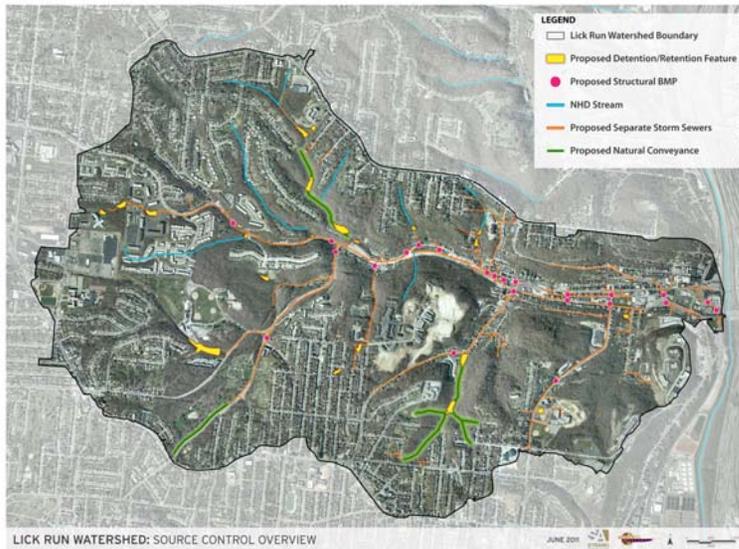
Input from the community will be critical in shaping any solutions that are presented to the Hamilton County Commissioners and state and federal regulators for approval. All potential solutions are in the early evaluation stages and subject to further analysis, review, and refinement.

No final decisions have been made, and we welcome your voice in the decision-making process. There will be additional opportunities in the near future to get involved.

Visit the booth titled, "How Can I Get Involved?" for more information.

Vision Phase

A synthesis of the preferred alternative



Comprehensive Solution



Integrated Approach



Community Amenities

deep tunnel (11%)



alternative solution (89%)



Community Support

Visualization of the proposed solutions





Selecting Achieves Confidence in Sound Stormwater and Flood Control Decision Making

This results through our Approach and Experience which:

- Provide Certainty in Viability and Value
- Leave No Rock Unturned
- Identify Implementable, Constructible, and Cost-effective Plans
- Provide the Foundation for a Community Supported Solution

