making systems safer

the voice and choice of public gas

Pipeline Safety Programs of the SIF

Kentucky Pipeline Safety Seminar
May 5, 2010

What is the APGA SIF

- 501(c)(3) non-profit foundation created in 2005 to assist small operators
- Receives funding from the Pipeline And Hazardous Materials Safety Administration (PHMSA) thru cooperative agreement
- Provides OQ evaluations, O&M procedures, SHRIMP and more

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OQ Evaluations

- Evaluations offered in ~56 covered tasks
- 1 day sessions held close to the target small utilities and master meters
- ~2100 people qualified-to-date
- More sessions scheduled across the US
- Perhaps your state next? Call us!

O&M Procedures

- Stand-alone procedures written for all 109 ASME B31Q distribution covered tasks
- Each procedure includes:
  - List of equipment and materials required
  - Potential worker safety issues
  - Step-by-step instructions and more
- Instructions exactly match SIF OQ evaluations
- Free to download at www.apgasif.org

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Compliance Training

- A one-day seminar on what to expect from and how to prepare for a compliance inspection
- Can be offered at state pipeline safety seminars
- The workshops have 3 primary goals:
  - Heighten regulatory awareness
  - Reduce safety risk, both public safety and non-compliance
  - Streamline and improve the actual audit process

SHRIMP

- Available very soon!
- On-line software product similar to tax preparation software (TurboTax)
- SHRIMP asks the user a series of questions about the system and its inspection and maintenance history
- Questions change based on answers
- Output will be a nearly complete DIM Plan

Drug and Alcohol Tool

- Provide guidance material for Parts 199 and 40
- Create an online development tool similar to SHRIMP
- Target Completion Date – Early Fall 2010

New Projects

- Enhancements to SHRIMP
  - O&M Manual Creator
  - Consolidate O&M, DIMP and OQ Plans

Distribution Integrity Management Programs (DIMP) History & Future

- 2001 – Liquid Integrity Management Rule
- 2003 – Transmission IMP Rule
- 2004 – DOT Inspector General Testifies
- 2005 – PHMSA Issues Phase 1 Report
- 2006 – Gas Piping Technology Committee (GPTC) Prepares Guidance
- 2008 – Notice of Proposed Rule (June 25, 2008)
- 2009 – Final Rule December 4, 2009
- 2011 – Develop written DIMP by August 2, 2011

Mandatory Items

- Install Excess Flow Valves on new and replaced services to single residences
- Report Compression Coupling failures in annual reports to PHMSA
- Have a procedure to manage LEAKS

Definitions

- Integrity = Ability of pipe to keep gas inside
- Integrity Management = Focusing resources on the areas of greatest risk
- Risk = Probability of a failure X consequences should a failure occur
- Failure = Loss of integrity, e.g. a leak, a rupture, unintended release of gas
- Threat = Things that can lead to a failure (corrosion, excavation damage, etc.)
- Additional/Accelerated Actions (AA Actions) = Actions over and above minimum rule requirements to address one or more threats

Example: Risk of Corrosion

- Some probability factors:
  - Material of construction (plastic or steel)
  - Cathodically protected?
  - CP levels adequate?
  - History of corrosion-caused leaks?
- Some consequence factors
  - Pressure/diameter
  - Under wall-to-wall pavement
  - Significance of the facility (e.g. sole-source feed?)

Phase 1: 7 Elements of a DIMP Plan

1. Develop a written integrity management plan
2. Know your infrastructure
3. Identify threats (existing and potential)
4. Assess and prioritize risk
5. Identify and implement measures to reduce risks
6. Measure and monitor performance, and
7. Report results

SHRIMP Development

- Funded through a cooperative agreement with PHMSA
- Advisory Group made up of state regulators, federal regulators and industry
- Technical Toolboxes, Software developer
- Heath and Associates, Technical Consultant
- Viadata, Technical Consultant

Introducing SHRIMP!

- Simple, Handy, Risk-based Integrity Management Plan

SHRIMP

- Software product similar to tax preparation software (TurboTax)
- SHRIMP asks the user a series of questions about the system and its inspection and maintenance history
- Questions change based on answers
- Output is a customized DIMP Plan addressing all 7 elements and any other provisions in the rule

SHRIMP Timing

- Due 6 months after final rule
- GOAL: Have SHRIMP trial version available when final rule is issued.
- That way utilities can decide whether to use SHRIMP or other means to develop DIMP
- SHRIMP is not limited to small utilities, municipal utilities or APGA members

2. Know Your Infrastructure

- SHRIMP asks questions to obtain appropriate infrastructure information:
  - Material(s) of construction
  - Leak history
  - Repair history
  - Inspection records, such as :
    - Cathodic protection
    - Leakage surveys
    - Exposed pipe inspections

3. Identify Threats

- SHRIMP includes questions for all 8 threats, based on GPTC and Advisors
- Phase 1 identified 8 threats:
  - Corrosion — Material or Welds
  - Natural Forces — Equipment
  - Excavation — Operations
  - Other Outside Force Damage — Other

4. Assess and Prioritize Risk

- Rank those 8 threats to entire pipeline or to pipeline segments
- SHRIMP uses an index model developed by the Advisors that applies weighting to the various probability and consequence factors

5. Implement Actions to Reduce Risks

- SHRIMP offers Additional/Accelerated Actions for each threat, based on GPTC Guide
- Based on threat questions, SHRIMP may suggest or rule out some AA Actions
- Operators may choose a SHRIMP option, or describe their own actions to address threats
- Choices are written into the DIMP plan

6. Measure and Monitor Results

- SHRIMP offers options for performance measures for each threat
- SHRIMP will recommend one or more options based on the additional action selected in Step 5
- Users can choose a SHRIMP option or describe their own measure(s)
- Choices are written into the DIMP plan

7. Report Results
External Performance Measures

- To allow states and PHMSA to determine if DIMP is working
  - Number of hazardous leaks either eliminated or repaired, per Sec 192.703(c), categorized by cause;
  - Number of excavation damages;
  - Number of excavation tickets (receipt of information by the underground facility operator from the notification center;
  - Number of EFV's installed – not used to measure performance
- Reporting via Annual Reports

7. Report Results
Internal Performance Measures

- To allow the operator to determine if its DIMP is working
  - Total number of leaks either eliminated or repaired, categorized by cause;
  - Number of hazardous leaks either eliminated or repaired, per Sec 192.703(c), categorized by cause;
  - Any additional measures to evaluated the effectiveness of the operator's program in controlling each identified threat.
- No reporting, but must be available for audit during state inspections

Consequence Factors

- User is asked for each segment would a failure here have greater consequences than average because of:
  - Larger diameter/higher pressure than most
  - In the business district under wall-to-wall pavement
  - The significance of the facility, and/or
  - The response time to get crews to it should it fail
- Results in multiplier of 1 to 1.5

SHRIMP Risk Ranking Model

- Risk = Probability times Consequence
- GPTC and SHRIMP questions address probability of a failure for each threat – each answer is given a weighting based on SME
- SHRIMP advisors developed questions to address consequences with weighting based on SMEs
- Risk scores are further adjusted based on national probability of failures resulting in incidents, and
- The operator's own record of leaks repaired by threat

SHRIMP Risk Ranking Model

- Probability Score for each threat (1-10)
- Consequence Multiplier (1 – 1.5)
- Inter-threat Weightings
  - One based on operator's leak repair history
  - Second based on probability of leaks resulting in reportable incidents (based on PHMSA national annual and incident report data 2005-07)

Example of Risk Ranking

- Threat segments are ranked from highest lowest by SHRIMP
  1. Corrosion on bare steel in the business district
  2. Excavation near the feeder main
  3. Excavation on the Northeast side
  4. Corrosion on bare steel near the creek outside the business district
  5. Natural forces on 1950 creek crossing
- User can change the order but must enter an explanation why

Select Additional/Accelerated Actions

- For each threat SHRIMP will offer a pick list of possible additional/accelerated actions
- These come from GPTC, with additions by the SHRIMP advisors
- Based on answers to the threat assessment questions some A/As may be recommended and others not offered
- Example: If CP levels are good, upgrading CP may not be offered as an A/A Action

Additional/Accelerated Actions

Corrosion on bare steel in business district	Replace 5% per year
Excavation near the feeder main	Inspect at least once per day
Excavation on the Northeast side	Increased public awareness
Corrosion on bare steel outside the business district	Increase leak surveys to once per year
Natural forces on two creek crossings	Inspect after heavy rains

Performance Measures

Corrosion on bare steel in business district	Replace 5% per year	Corrosion leaks repaired/mile and /service
Excavation near the feeder main	Inspect at least once per day	# of excavation damages
Excavation on the Northeast side	Increased public awareness	# of excavation damages
Corrosion on bare steel outside the business district	Increase leak surveys to once per year	Corrosion leaks repaired/mile and /service
Natural forces on two creek crossings	Inspect after heavy rains	# of natural force damage leaks repaired

SHRIMP Creates a Written DIM Plan

- Documents significant decisions made in previous steps
- Addresses all seven required elements
- Include required provisions on LEAKS, EFVs and, most likely, mechanical coupling failure reporting

The DIM Plan Template

1. SCOPE
2. DEFINITIONS
3. KNOWLEDGE OF THE DISTRIBUTION SYSTEM
4. THREAT EVALUATION
5. RISK EVALUATION AND PRIORITIZATION
6. ADDITIONAL/ACCELERATED MEASURES TO ADDRESS RISKS

Plan Template continued

7. MEASURE PERFORMANCE, MONITOR RESULTS AND EVALUATE EFFECTIVENESS
8. PERIODIC EVALUATION AND IMPROVEMENT
9. REPORTING
10. RECORD KEEPING

ATTACHMENTS

Security

- Initial log in for a system will be verified with that system
- Initial user will be contacted to verify subsequent people attempting to log into that system
- Users can only see and edit their system's information
- Users can be read-only of full access

Pricing (Annual fee*)

System size (# of services)	
1-1000	Free
1001-5000	$ 100
5001-20K	$ 250
20K-35K	$ 500
35K-50K	$ 750
50K - 75K	$ 1,500
> 75K	$ 5,000

*Initial fee good through the 18 months allowed by the rule to write the initial DIMP Plan

SHRIMP Users

- 140 Systems have signed up
- Includes Master Meter Operators
  Municipal Operators
  Investor Owned Utilities
- Largest: 800,000+ Customers
- Smallest: 32 Customers

Implementation

- Available - June 1

- http://shrimp.imp-tools.com/

  Username: Shrimp

  Password: Advisor

How Can I Prepare?

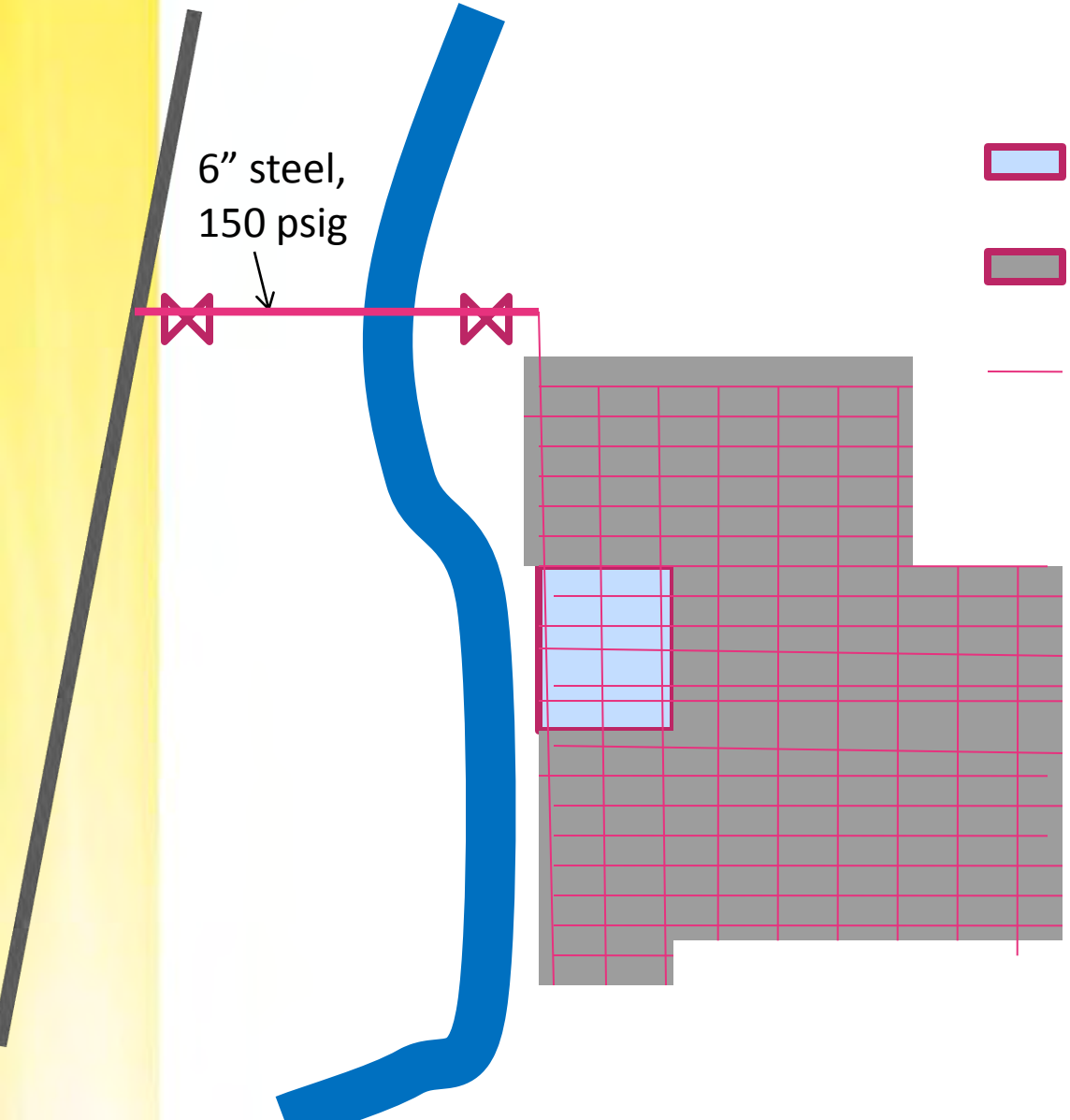
- Assemble your construction, inspection and maintenance records (5 years)
- Can you:
  - Separate leak repairs and exposed pipe inspections by material and Cathodic protection?
  - Plot leak repairs by cause and one-call locate tickets by geographic area on your system?
- Looking for concentrations of leaks, low CP, etc will assist in using SHRIMP

Hypothetical Case Study

- Walk through the process of developing a plan for—

Kastanasburg

Welcome to Kastanasburg, 1950

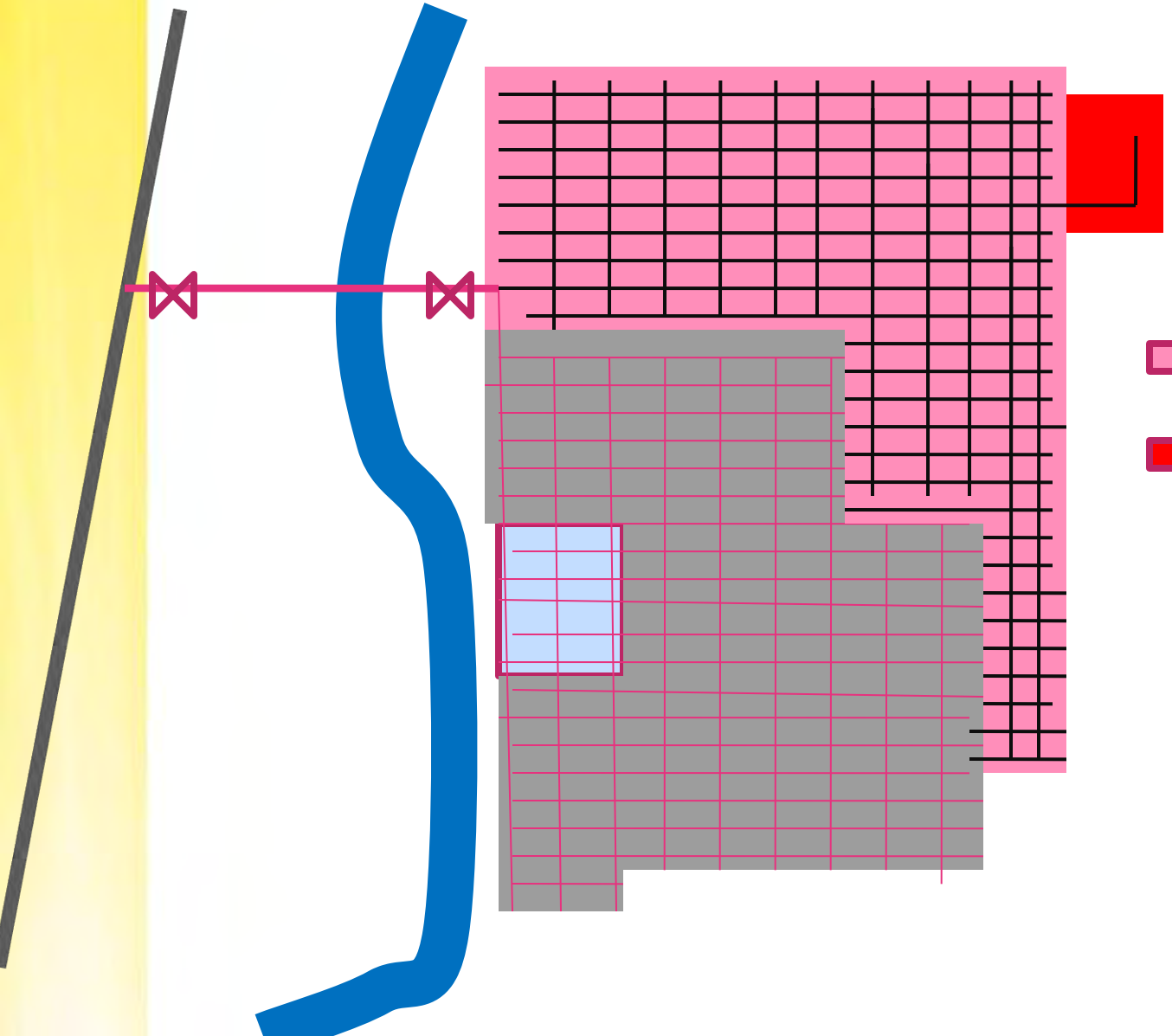


Downtown business district

Residential

1” – 4” Bare, unprotected steel mains and services, MAOP = 10 psig

Kastanasburg Expands, 1975

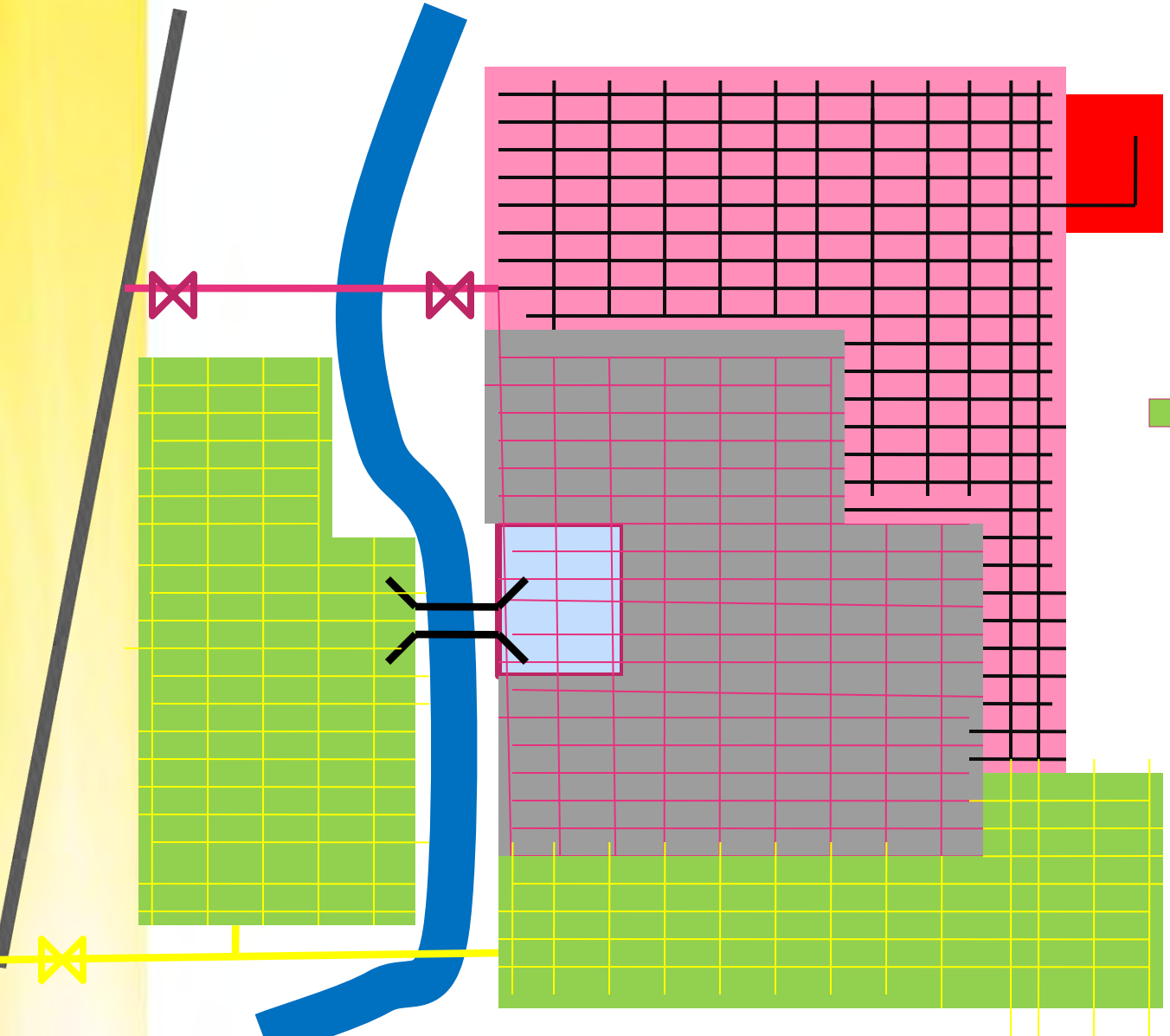


New residential

Mall

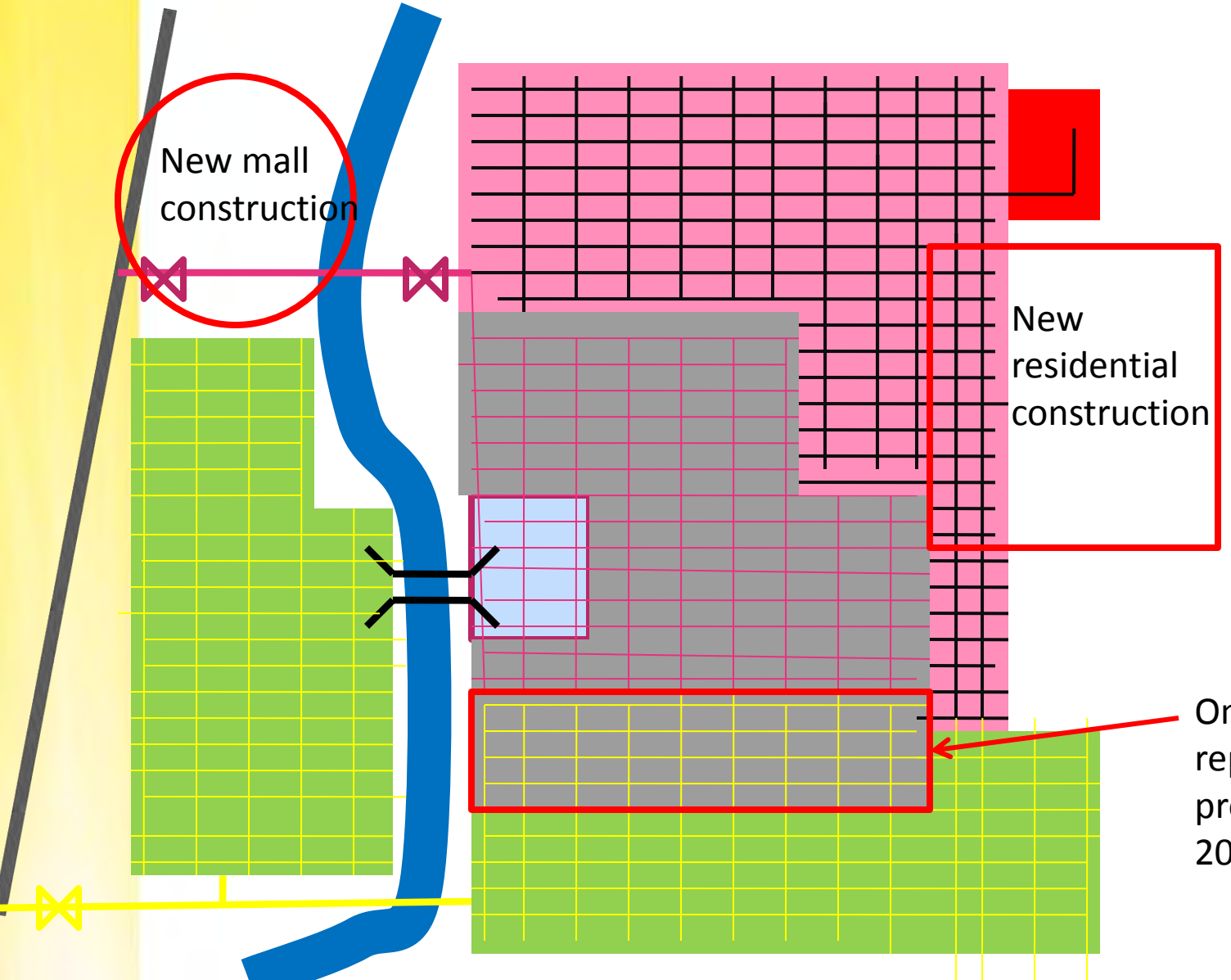
1” – 4” Coated,
Protected steel
10 psig

Kastanasburg Expands Further, 2000

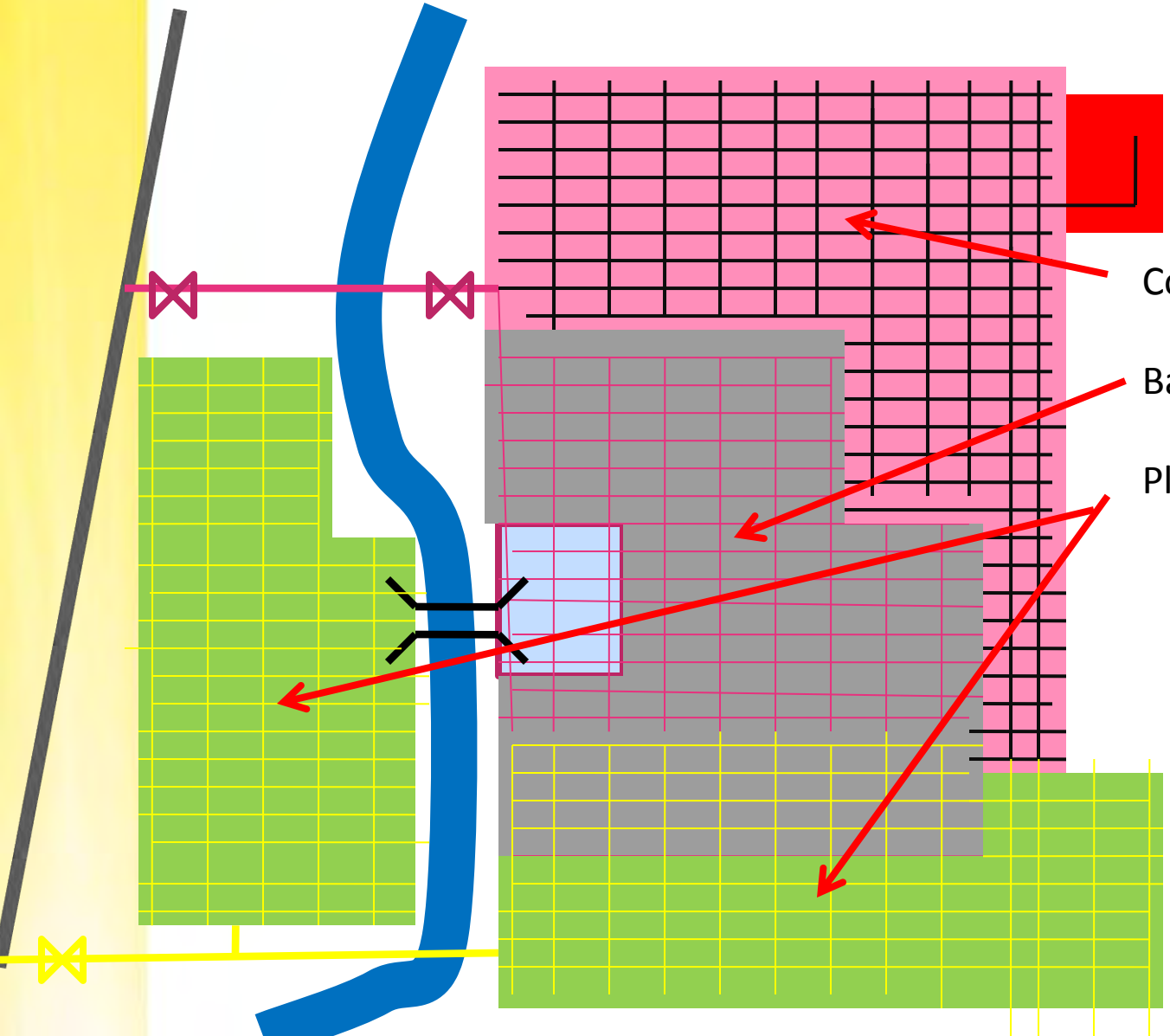


New residential
½” – 4 “ PE,
60 psig

Kastanasburg – Today



Corrosion Threat Segments

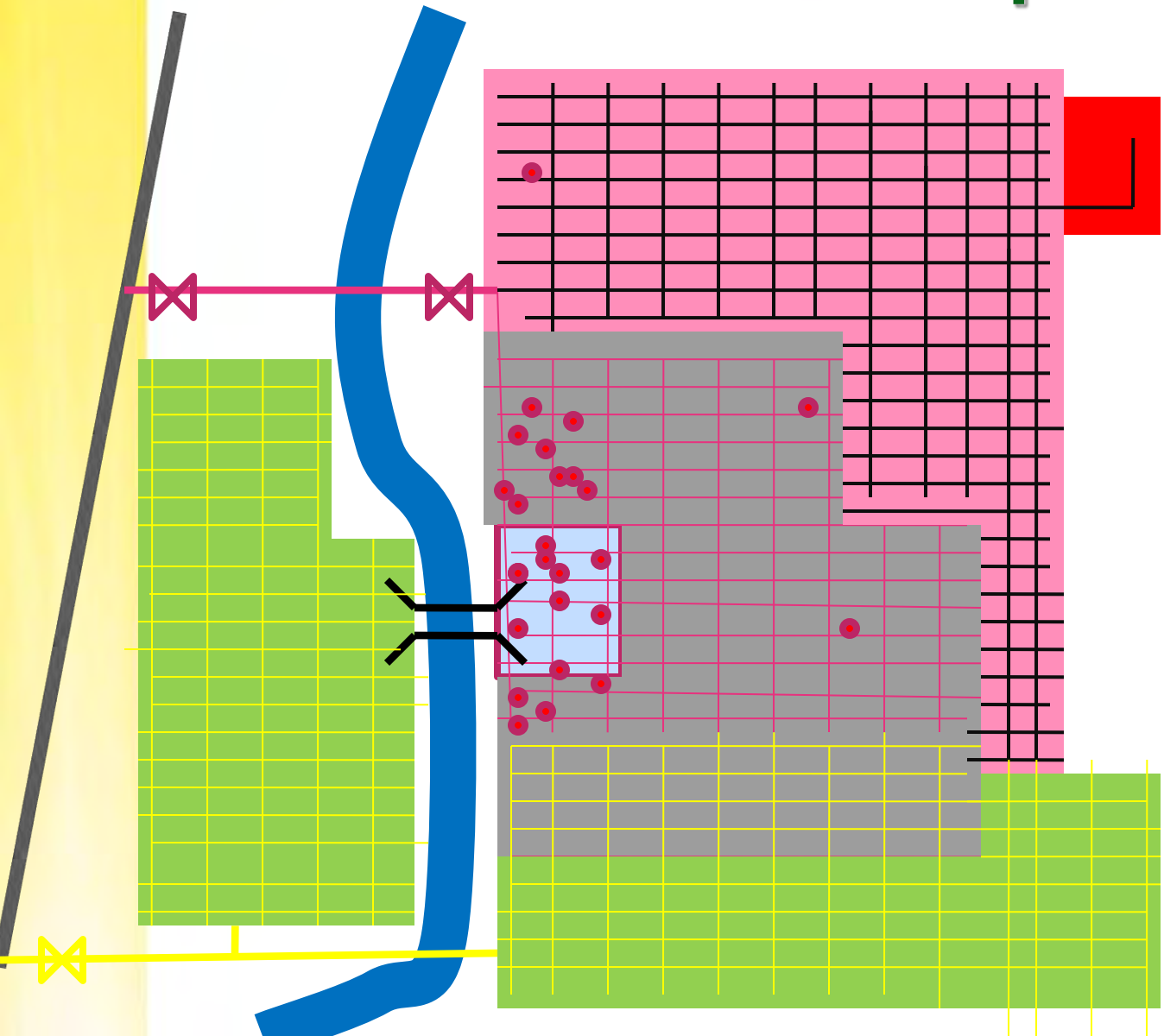


Coated, CP protected steel

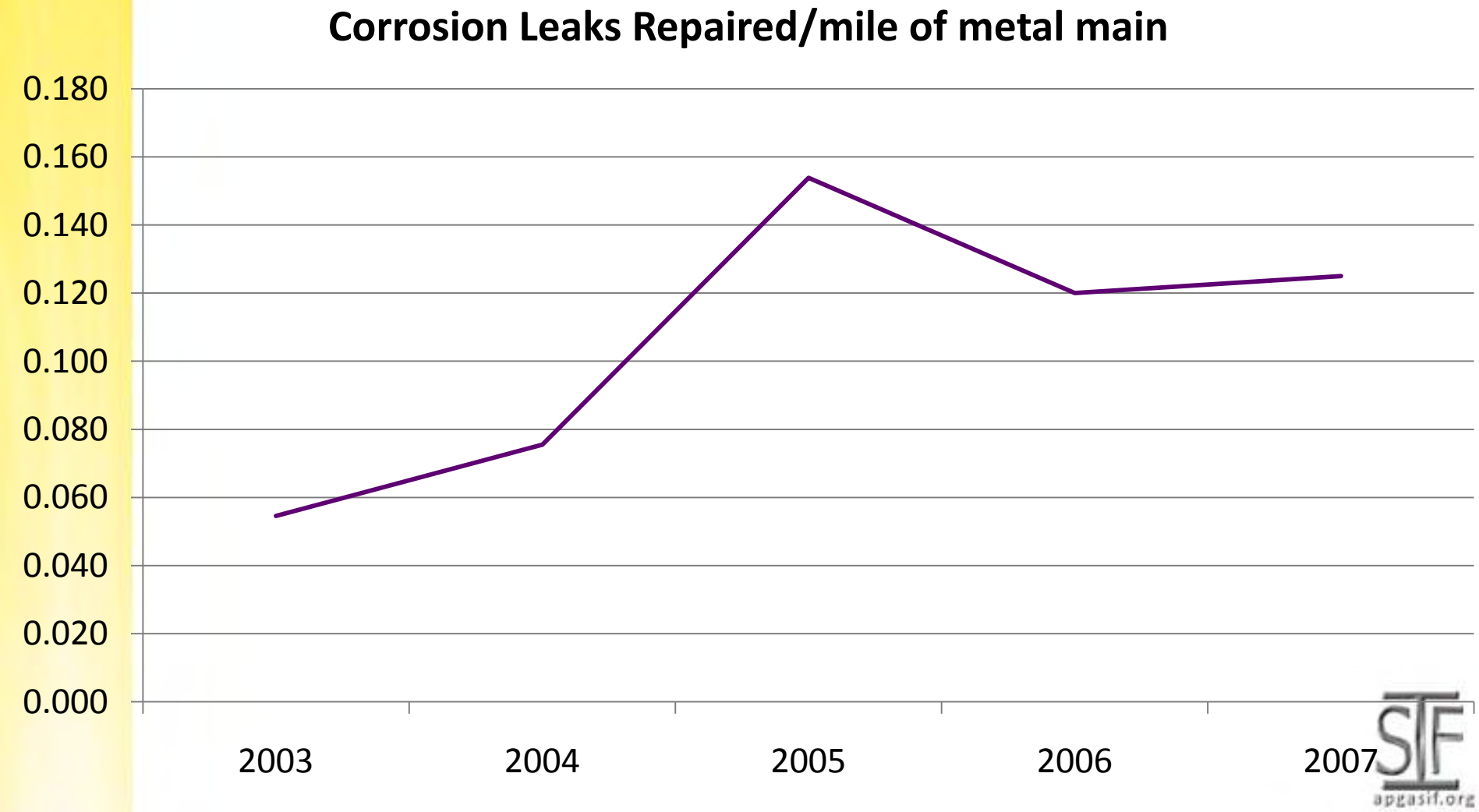
Bare unprotected steel

Plastic mains and services

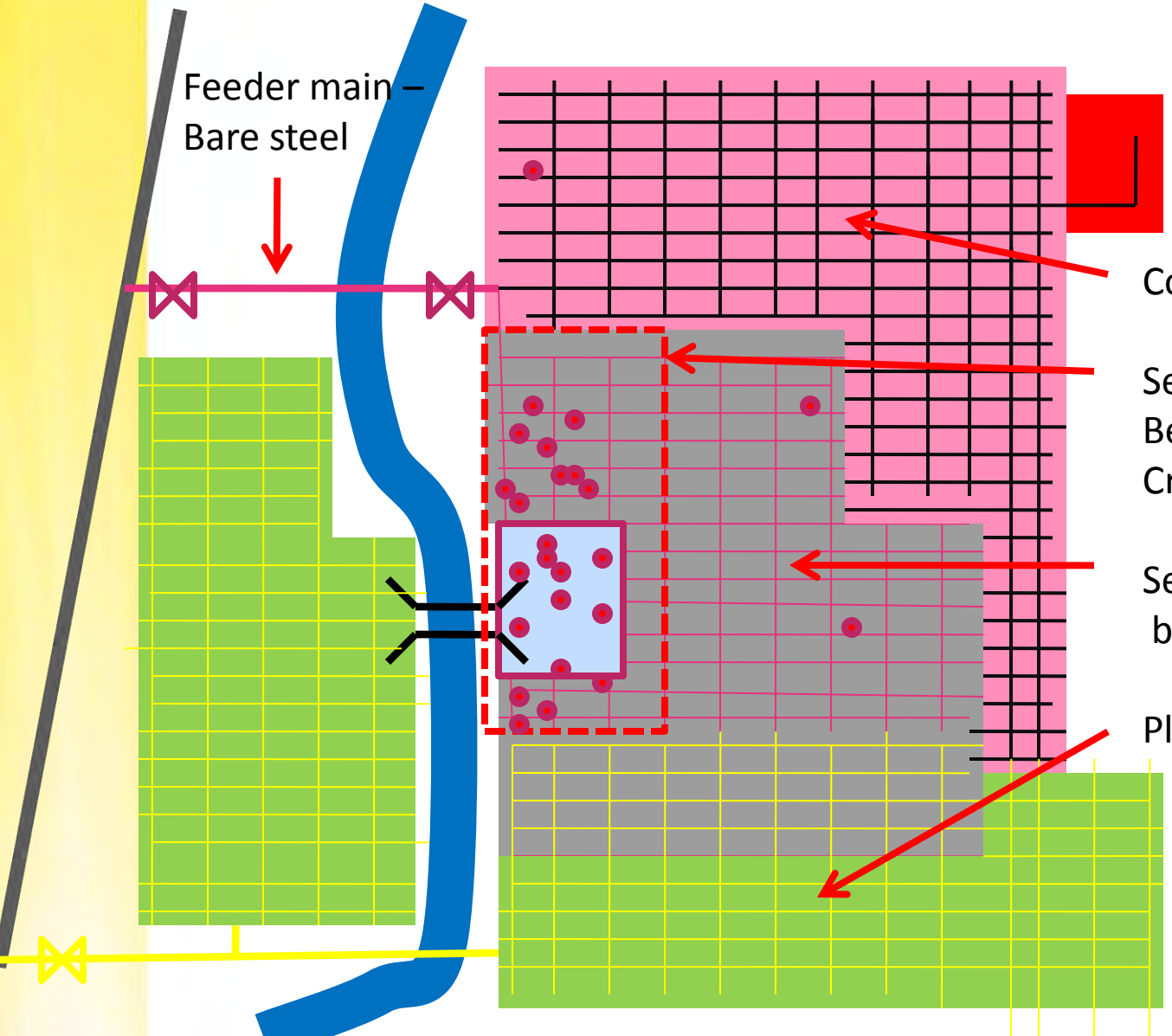
Corrosion Leaks Repaired 2003-2007



Trend in Corrosion Leaks Repaired



4 Corrosion Threat Segments



Coated, CP protected steel

Segment EC1: Bare steel Between 4th Ave and the Creek

Segment EC2: Remaining bare steel

Plastic mains and services

QUESTIONS?

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