



June 27, 2022

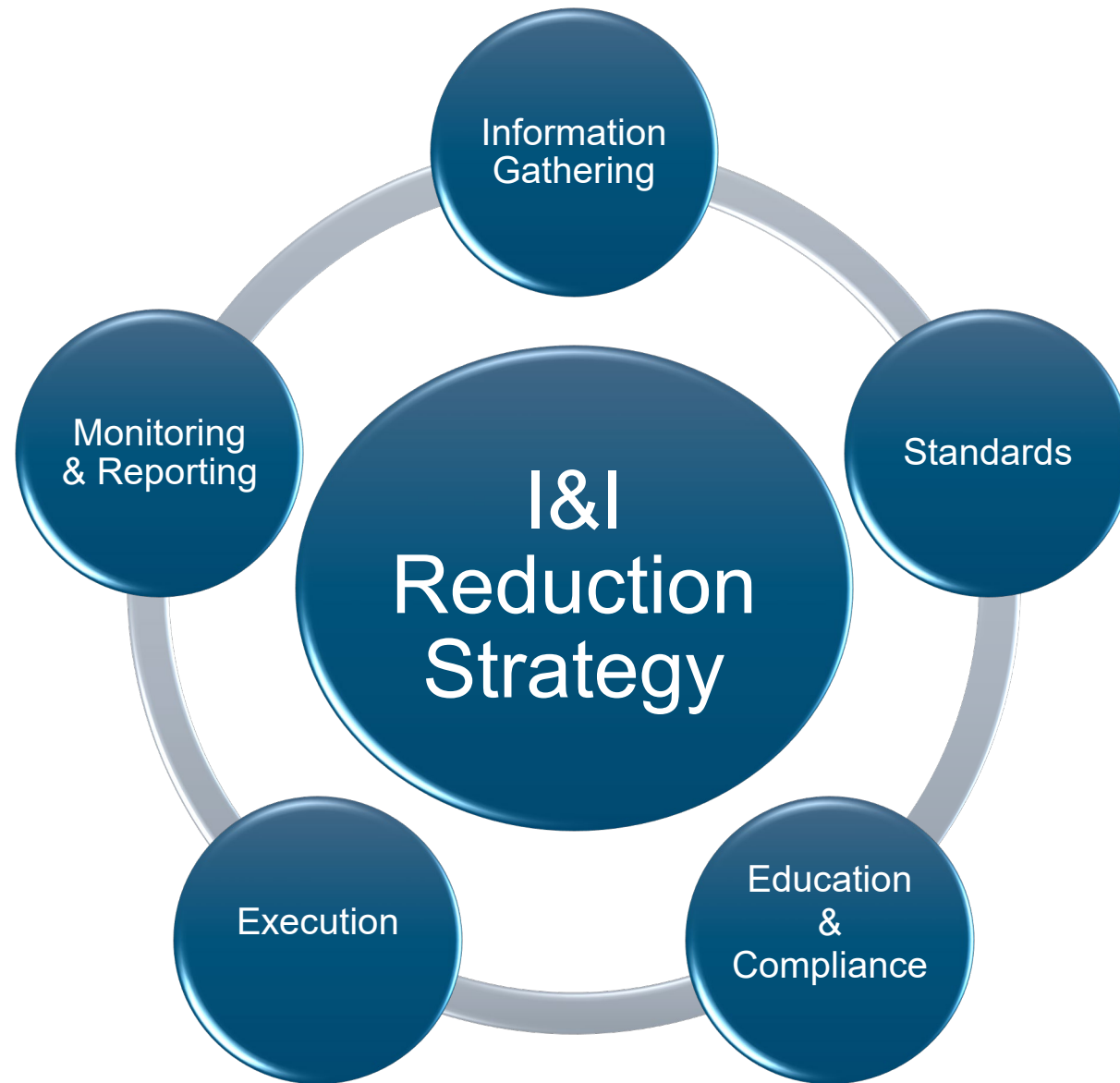
Brent Rolufs, Manager of Capital Projects
Shawn Carey, Director of Operations

Inflow and Infiltration Reduction Strategy

Committee of the Whole – June 27, 2022

Presentation Outline

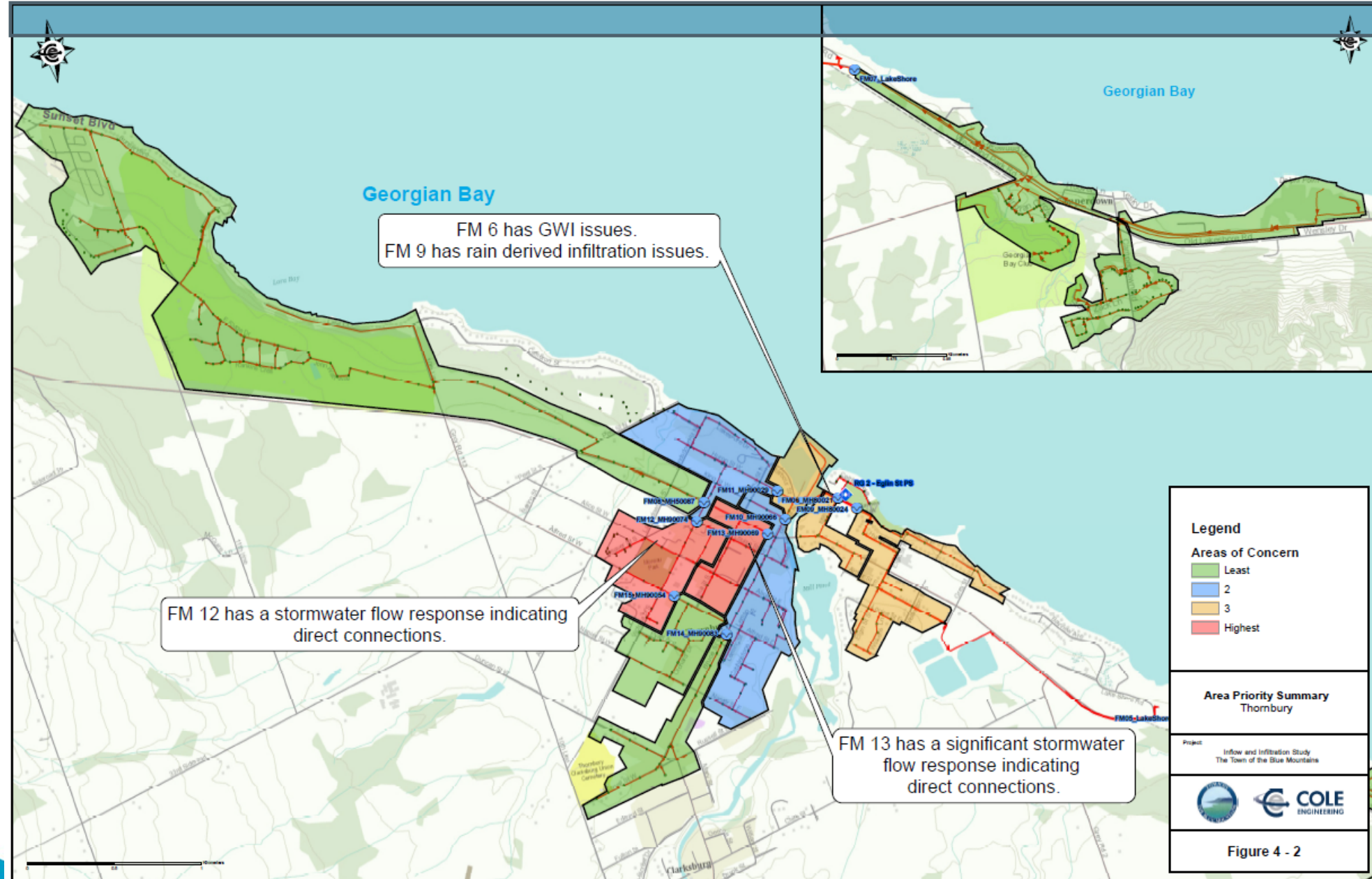
- I&I Sanitary System Overview
- Potential I&I Defects
- Reduction Strategy – Themes
 - Education & Compliance
 - Information Gathering
 - Standards
 - Execution
 - Monitoring & Reporting
- Next Steps



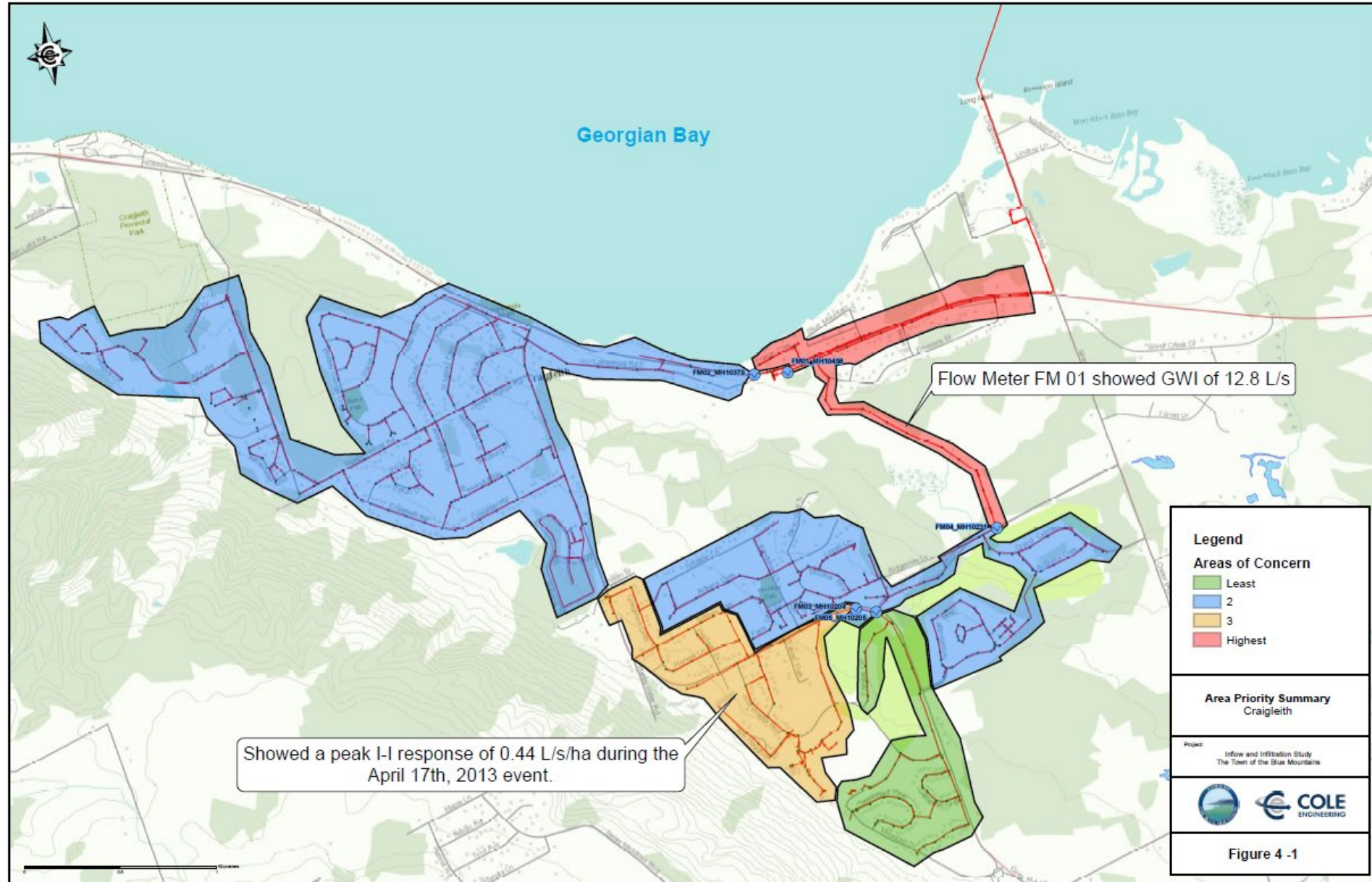
The background is a solid teal color. Overlaid on this are stylized, layered shapes representing a mountain range and a body of water. The mountains are depicted as overlapping, rounded silhouettes in varying shades of teal, with the foreground mountains being a darker shade. A winding, irregular shape representing a lake or river is positioned in the lower half of the image, also in a teal shade. The overall aesthetic is clean and modern.

Information Gathering

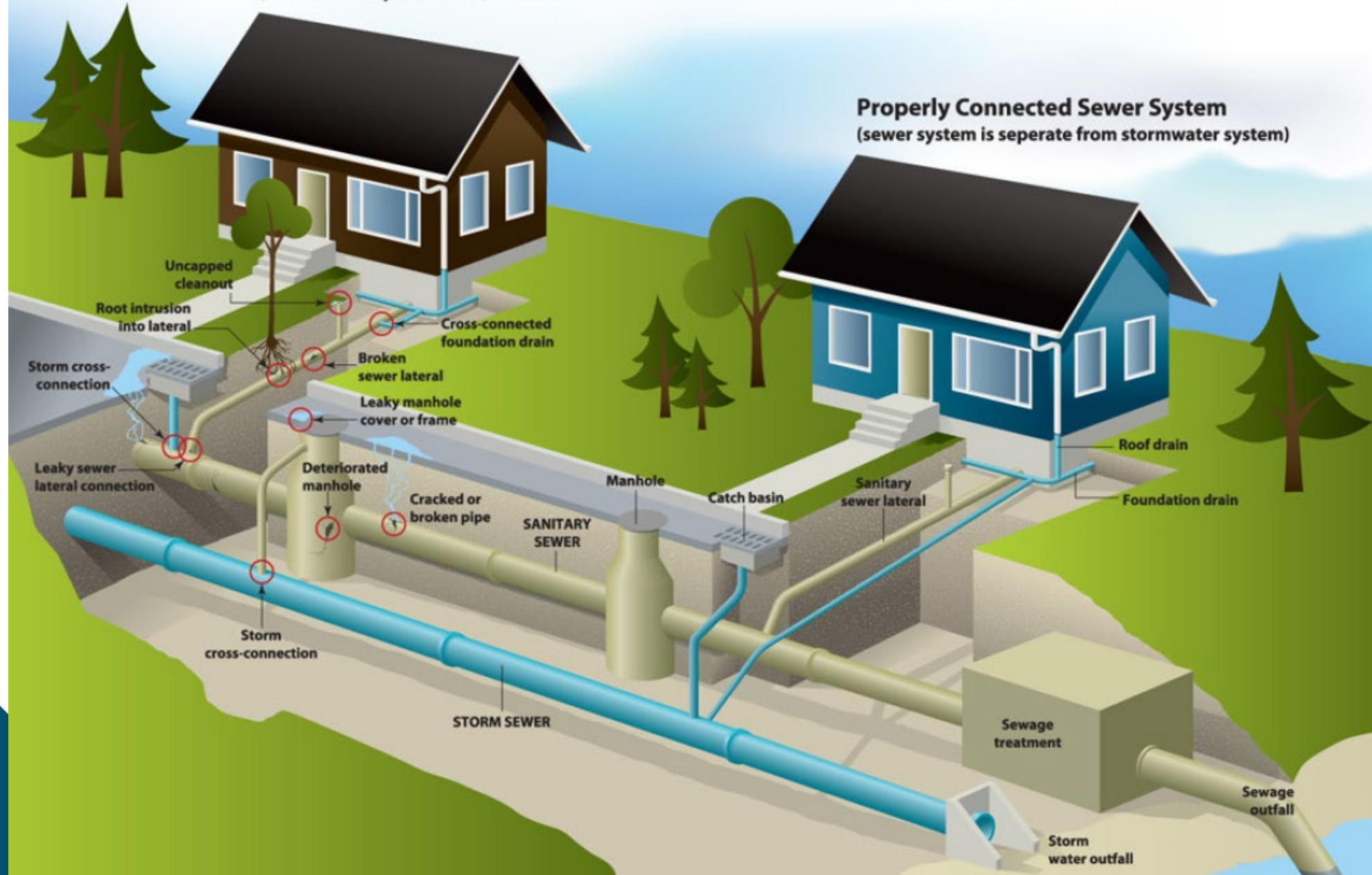
Thornbury Sanitary System



Craigleith Sanitary System



Sources of Inflow and Infiltration (as indicated by red circles)



Potential I&I Defects

Cross Connections	Investigation Methods	Information Management
Lateral CCTV Inspections	<ol style="list-style-type: none"> 1. Current and Upcoming Linear Reconstruction Projects – complete Lateral CCTV Inspection 2. Operational Investigation to Sanitary Issues 	Registered within GIS System
Foundation Drain / Sump Pump Investigation	<ol style="list-style-type: none"> 1. Current and Upcoming Linear Reconstruction Projects – complete Lateral CCTV Inspection 2. Building Inspections 	Registered within GIS System
Cross Connect Foundation Drains	<ol style="list-style-type: none"> 1. Current and Upcoming Linear Reconstruction Projects – complete Lateral CCTV Inspection 2. Future Inspection Program <ul style="list-style-type: none"> • Inspection at time of property ownership change, 	Registered within GIS System
Leaky Maintenance Cover or Frame	<ol style="list-style-type: none"> 1. Operational Asset Management Annual Inspections 	Registered within GIS System

Potential I&I Defects

Cross Connections	Investigation Methods	Information Management
Maintenance Covers	1. Operational Asset Management Annual Inspections	Registered within GIS System
Storm Cross Connection	1. Operational Asset Management Annual Inspections	Registered within GIS System
Crack or Broken Pipe	1. CCTV Inspection and Repair Program	Registered within GIS System
Stormwater Cross Connection	1. CCTV Inspection and Repair Program	Registered within GIS System
Uncapped Cleanouts	1. Building Inspections, 2. Operational Asset Management Annual Inspections	Registered within GIS System

Information Gathering

Data Sources

- Capital Projects involving Sanitary Upgrades
 - During home inspections, possible sump and sanitary connections to be collected
 - CCTV of Sanitary Lateral Piping
- Operations & Building Department Inspection Reporting
 - Identified I&I Concerns to be Collected
- I&I Flow Monitoring Program
 - Utilize the 2014 Inflow and Infiltration Study as baseline
 - 2023 Inflow and Infiltration Study to compare back to 2014 Baseline Data
 - Town Wide Wastewater Collection Master Plan
- Water Meter Replacement Program
 - During home inspections, possible sump and sanitary connections to be collected

Information Gathering

Development of Centralize Data Collection

- GIS Layers
 - Operational Identified I&I Concerns
 - During home inspections, possible sump and sanitary connections to be collected
 - Capital Projects involving Sanitary Upgrades
 - Water Meter Replacement Program
 - Building Department Inspections
- CCTV Historical Data

Information Gathering

Project Schedule : Information Gathering

Current Year Mon, 5/30/2022

						30-May-22	6-Jun-22	13-Jun-22	20-Jun-22	27-Jun-22	4-Jul-22	11-Jul-22	18-Jul-22	25-Jul-22	1-Aug-22	8-Aug-22	15-Aug-22	22-Aug-22	29-Aug-22	5-Sep-22	12-Sep-22	19-Sep-22	26-Sep-22	3-Oct-22	10-Oct-22	17-Oct-22	24-Oct-22	31-Oct-22	7-Nov-22	14-Nov-22	21-Nov-22	28-Nov-22	5-Dec-22	12-Dec-22	19-Dec-22	26-Dec-22
PROJECT ID	TASK ID	TASK	START	END	# OF WEEKS	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
Inspections																																				
2022 Inf 01	1.1.1	Internal Discussion	30-May-22	15-Aug-22	12																															
2022 Inf 01	1.1.2	Checksheet Development	15-Aug-22	5-Sep-22	4																															
2022 Inf 01	1.1.3	Checksheet Roll Out	5-Sep-22	26-Sep-22	4																															
Operations Reporting in GIS																																				
2022 Inf 02	1.2.1	Internal Discussion	30-May-22	13-Jun-22	3																															
2022 Inf 02	1.2.2	GIS Setup	13-Jun-22	1-Aug-22	8																															
2022 Inf 02	1.2.3	Project Roll Out	1-Aug-22	19-Sep-22	8																															
2022 Inf 02	1.2.4	Field Testing / Reporting	19-Sep-22	24-Oct-22	6																															
2022 Inf 02	1.2.5	Testing	19-Sep-22	24-Oct-22	6																															
2022 Inf 02	1.2.6	Project Close-out	24-Oct-22	28-Nov-22	6																															
I&I Flow Monitoring Program																																				
2022 Inf 03	1.3.1	Wastewater EA Monitoring	30-Sep-22	22-Sep-23	52																															
2022 Inf 03	1.3.2	2023 Flow Program	30-May-23	21-May-24	52																															
2022 Inf 03	1.3.3	Project Close-out	21-May-24	9-Jul-24	8																															
Watermeter Replacement Program																																				
2022 Inf 04	1.4.1	Inspections	30-Oct-22	10-Mar-24	72																															

Standards

Standards

1. Town Engineering Standards

- Update to ensure engineering designs investigate I&I
- Minimize I&I into sanitary system
- Include reference to OPSS. Muni 410, 407
 - Construction related requirements

2. Project Deliverables

- I&I Strategy for All Capital Projects having Sanitary Systems
 - Maintenance Holes,
 - Sanitary Piping Connections
 - Field Testing Requirements
- Field Testing Reporting
 - CCTV Inspections,
 - Infiltration / Exfiltration Testing – Water Table Consideration
 - Water Testing, Low Pressure Air Testing
 - Lateral Inspections
 - Deflection Testing of Sanitary Piping

Standards

Project Schedule : Standards

Current Year Mon, 5/30/2022

						30-May-22	6-Jun-22	13-Jun-22	20-Jun-22	27-Jun-22	4-Jul-22	11-Jul-22	18-Jul-22	25-Jul-22	1-Aug-22	8-Aug-22	15-Aug-22	22-Aug-22	29-Aug-22	5-Sep-22	12-Sep-22	19-Sep-22	26-Sep-22	3-Oct-22	10-Oct-22	17-Oct-22	24-Oct-22	31-Oct-22	7-Nov-22	14-Nov-22	21-Nov-22	28-Nov-22	5-Dec-22	12-Dec-22	19-Dec-22	26-Dec-22
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Engineering Standards																																				
2022 Eng 01	1.1.1	Internal Discussion	30-May-22	13-Jun-22	2																															
2022 Eng 01	1.1.2	Water Scope	13-Jun-22	4-Jul-22	4																															
2022 Eng 01	1.1.3	Wastewater Scope	4-Jul-22	25-Jul-22	4																															
2022 Eng 01	1.1.4	Roads & Drainage	25-Jul-22	15-Aug-22	4																															
2022 Eng 01	1.1.5	Construction	15-Aug-22	5-Sep-22	4																															
2022 Eng 01	1.1.6	Project Close-out	5-Sep-22	12-Sep-22	2																															
Project Deliverables																																				
2022 Pro 01	1.2.1	Internal Discussion	30-May-22	15-Aug-22	12																															
2022 Pro 01	1.2.2	Maintenance Holes	15-Aug-22	5-Sep-22	4																															
2022 Pro 01	1.2.3	Pipe Connections	5-Sep-22	26-Sep-22	4																															
2022 Pro 01	1.2.4	Field Testing / Reporting	26-Sep-22	31-Oct-22	6																															
2022 Pro 01	1.2.5	Project Close-out	31-Oct-22	5-Dec-22	6																															

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Education and Compliance

Education and Compliance

Education:

1. Resident Communication

- Web Page Updates
- Pamphlets with Water Bills
 - Facts and Figures of Inflow and Infiltration Impact
- Development of PIC information to be included in all Capital Projects with Sanitary Scope

2. Resident Rebate Program

- Incentivize Disconnection of Residential Stormwater from Sanitary Line
- Eligibility & Application Process

Education and Compliance

Compliance:

1. Bylaw Updates
 - Administrative Monetary Penalties
 - Private Development Inspection Program / Maintenance Program Required
 - Approximately 10% Sanitary Lines are on Private Lands
 - Illegal Sanitary Connections
 - Focus on Private Condominiums
 - CCTV inspection requirements
 - Reporting of repairs
2. Dedicated Bylaw Officer
3. Bylaw Enforcement Strategy
 - Aligned with Capital Projects & Annual I&I Workplan
 - Informed by GIS tracking system

Training:

1. Home Inspection Training
 - Possible sump and sanitary lateral connections to be collected
 - Operations Operators, Building Inspectors, Capital Project Coordinators, Water Meter Tech
 - Centralized GIS database and tracking system

Education and Compliance

Project Schedule : Education and Compliance

Current Year Mon, 5/30/2022

						30-May-22	6-Jun-22	13-Jun-22	20-Jun-22	27-Jun-22	4-Jul-22	11-Jul-22	18-Jul-22	25-Jul-22	1-Aug-22	8-Aug-22	15-Aug-22	22-Aug-22	29-Aug-22	5-Sep-22	12-Sep-22	19-Sep-22	26-Sep-22	3-Oct-22	10-Oct-22	17-Oct-22	24-Oct-22	31-Oct-22	7-Nov-22	14-Nov-22	21-Nov-22	28-Nov-22	5-Dec-22	12-Dec-22	19-Dec-22	26-Dec-22
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Resident Communication																																				
2022 Edu 01	1.1.1	Internal Discussion	30-May-22	18-Jul-22	8																															
2022 Edu 01	1.1.2	Develop Water Bill Inserts	6-Jun-22	19-Sep-22	16																															
2022 Edu 01	1.1.3	PIC Information Development	27-Jun-22	10-Oct-22	16																															
2022 Edu 01	1.1.4	Quarterly Webpage Update	19-Sep-22	9-Sep-24	104																															
2022 Edu 01	1.1.5	Bylaw Update Rollouts	27-Feb-23	19-Feb-24	52																															
Compliance																																				
2022 Com 01	1.2.1	Internal Discussion	30-May-22	4-Jul-22	6																															
2022 Com 01	1.2.2	Bylaw Update Development	4-Jul-22	14-Nov-22	20																															
2022 Com 01	1.2.3	Council Bylaw Approvals	14-Nov-22	27-Feb-23	16																															
2022 Com 01	1.2.4	Bylaw Enforcement Start	27-Feb-23	27-Feb-23	1																															

I&I Reduction - Execution

I&I Reduction Execution – 2022 Start

2022 I&I Program – Request for Proposals

1. Review 2018-2021 CCTV Information
 - Project Identification
 - Tender Package Development on Identified Projects
2. Timmons Easement
 - Assessment of Repair Options
 - Tender and Execute preferred repair options
3. Develop CCTV program for 2023 to 2026

I&I Reduction Execution – 2022 Start

I&I Projects

1. Hwy 26 Sanitary Line Maintenance Hole Cover Sealing
 - Seal maintenance hole covers for sanitary line that is located in the bottom of the ditch.
2. Grey Road 21 Maintenance Holes
3. Thornbury West Reconstruction Phase 1A and 1B

I&I Reduction Execution – 2022 Start

Project Schedule : I&I Reduction Execution – 2022 Start

Current Year Mon, 5/30/2022

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2022 I&I Program - RFP																																				
2022 Exe 01	1.1.1	Internal Discussion	30-May-22	20-Jun-22	4																															
2022 Exe 01	1.1.2	RFP Development	20-Jun-22	15-Aug-22	9																															
2022 Exe 01	1.1.3	Package - Timmons	15-Aug-22	31-Oct-22	12																															
2022 Exe 01	1.1.4	Package - CCTV Projects	10-Oct-22	23-Jan-23	16																															
2022 Exe 01	1.1.5	Package - CCTV 2023	9-Jan-23	27-Mar-23	12																															
2022 Exe 01	1.1.6	Timmons Repair	15-May-23	21-Aug-23	15																															
2022 Exe 01	1.1.7	CCTV 2023	15-May-23	25-Sep-23	20																															
I&I Projects - Hwy 26 Sanitary Line Maintenance Hole Covers Sealing																																				
2022 Exe 02	1.2.1	Internal Discussion	30-May-22	6-Jun-22	2																															
2022 Exe 02	1.2.2	Sealing Maintenance Covers	6-Jun-22	8-Aug-22	10																															
I&I Projects - Thornbury West Phase 1A																																				
2022 Exe 03	1.3.1	Reconstruction	13-Jun-22	28-Nov-22	25																															
I&I Projects - Thornbury West Phase 1B																																				
2022 Exe 04	1.4.1	Reconstruction	15-May-23	30-Oct-23	25																															
I&I Projects - Grey Road 21 Maintenance Hole																																				
2022 Exe 05	1.5.1	Reconstruction	15-May-23	15-May-23	1																															

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Monitoring & Reporting

Monitoring & Reporting

Reporting Requirements

1. Annual Report to Council

- Information Gathered
- Standards Updates
- Education and Compliance
- I&I Reduction Action

2. Adaptive Management Approach

- Integrate & Update as new information becomes available
 - I&I Flow Monitoring Program
 - Town-Wide Wastewater Collection Master Plan
 - GIS database and tracking system
- Additional Reporting to be Developed

Reporting

Project Schedule : I&I Reporting

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Annual Report																																				
2022 Rep 01	1.1.1	Internal Discussion	30-May-22	15-Aug-22	12																															
2022 Rep 01	1.1.2	Develop Reporting Structure	15-Aug-22	19-Dec-22	19																															
2022 Rep 01	1.1.3	Draft Report	4-Jan-23	18-Jan-23	3																															
2022 Rep 01	1.1.4	Final Report	18-Jan-23	1-Feb-23	3																															

Summary & Next Steps

Ongoing & Evolving Strategy

- Adapt with new information
- Additional reporting to be developed

Development of Residential Rebate Program

- Eligibility & Requirements
- Application Process
- Rebate structure & funding source

Staff Awareness & Training

- What to look for & how to record (GIS-based tracking system)

Questions?

