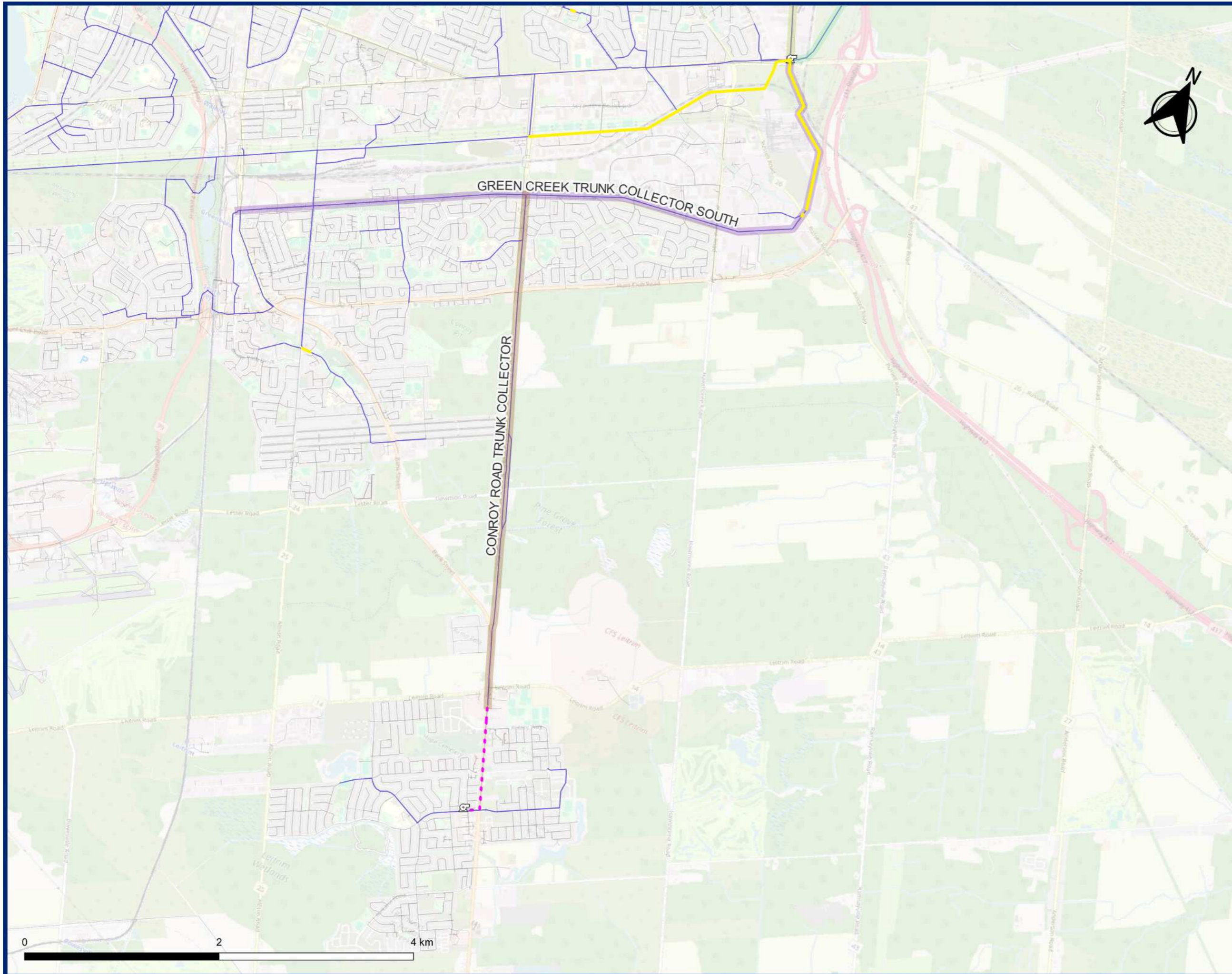


# Appendix A

## Modelling Results



OPA Urban Boundary Expansion  
Wastewater Infrastructure Assessment

**Trunk Sewers**

- SOUTH OTTAWA TUNNEL
- CONROY ROAD TRUNK COLLECTOR
- GREEN CREEK TRUNK COLLECTOR NORTH
- GREEN CREEK TRUNK COLLECTOR SOUTH

**Modelling Results**

Junctions (Maintenance Holes)

- Flooding
- HGL Near Surface (<1.8m Depth)

Conduits (Sewer Pipes)

- $d/D \geq 0.8$
- $q/Q \geq 1$

**Existing Sanitary Sewer Infrastructure (VERTICAL)**

WW Facilities

- WWPS
- WWTP

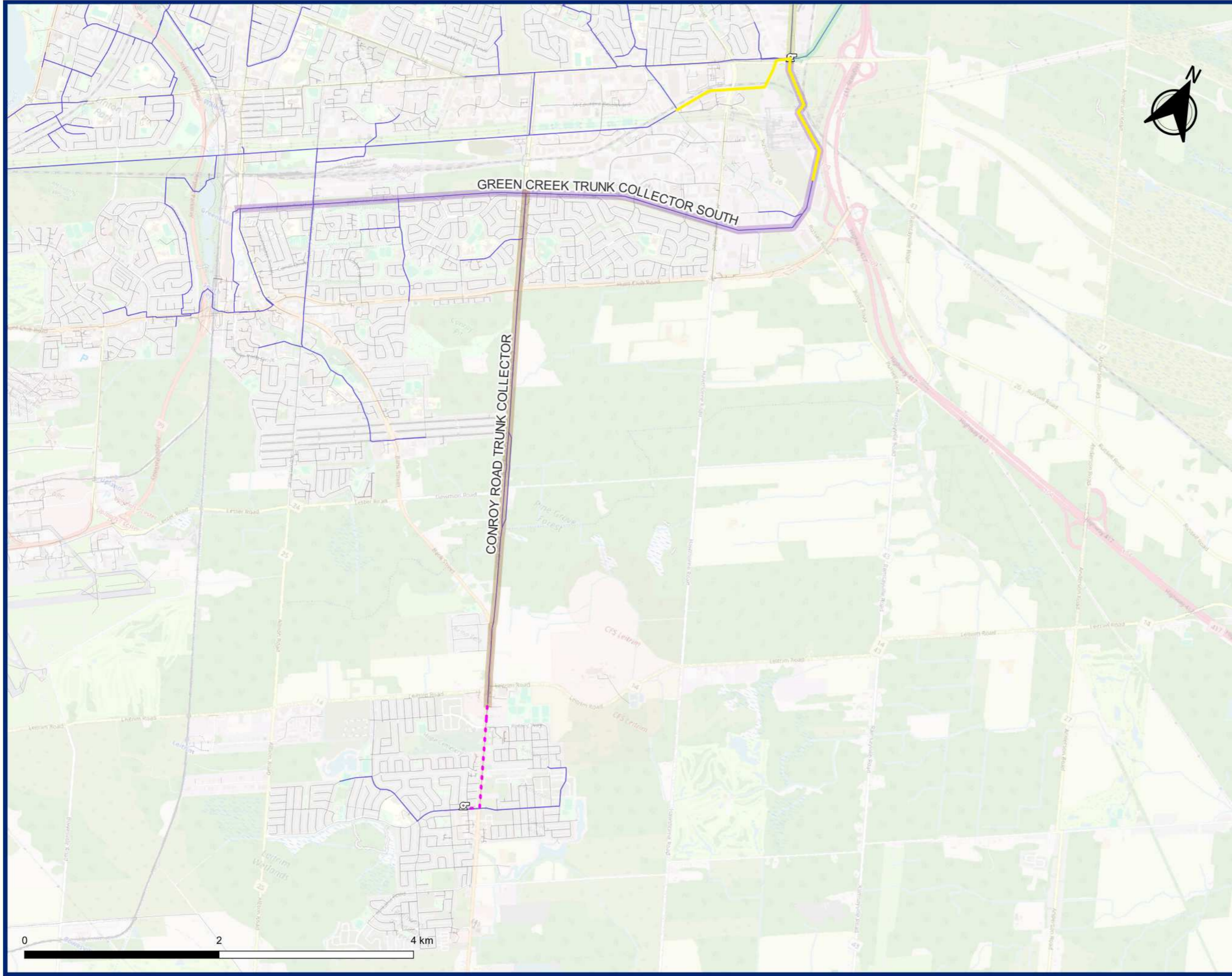
**Existing Sanitary Sewer Infrastructure (LINEAR)**

Network

- Gravity Sewer
- Forcemain
- Local Sewer

Figure 2-1  
Existing Conditions  
1-in-25-Year June 2014 Event  
*Leitrim*





OPA Urban Boundary Expansion  
Wastewater Infrastructure Assessment

**Trunk Sewers**

- SOUTH OTTAWA TUNNEL
- CONROY ROAD TRUNK COLLECTOR
- GREEN CREEK TRUNK COLLECTOR NORTH
- GREEN CREEK TRUNK COLLECTOR SOUTH

**Modelling Results**

Junctions (Maintenance Holes)

- Flooding
- HGL Near Surface (<1.8m Depth)

Conduits (Sewer Pipes)

- d/D >= 0.8
- q/Q >= 1

**Existing Sanitary Sewer Infrastructure (VERTICAL)**

WW Facilities

- WWPS
- WWTP

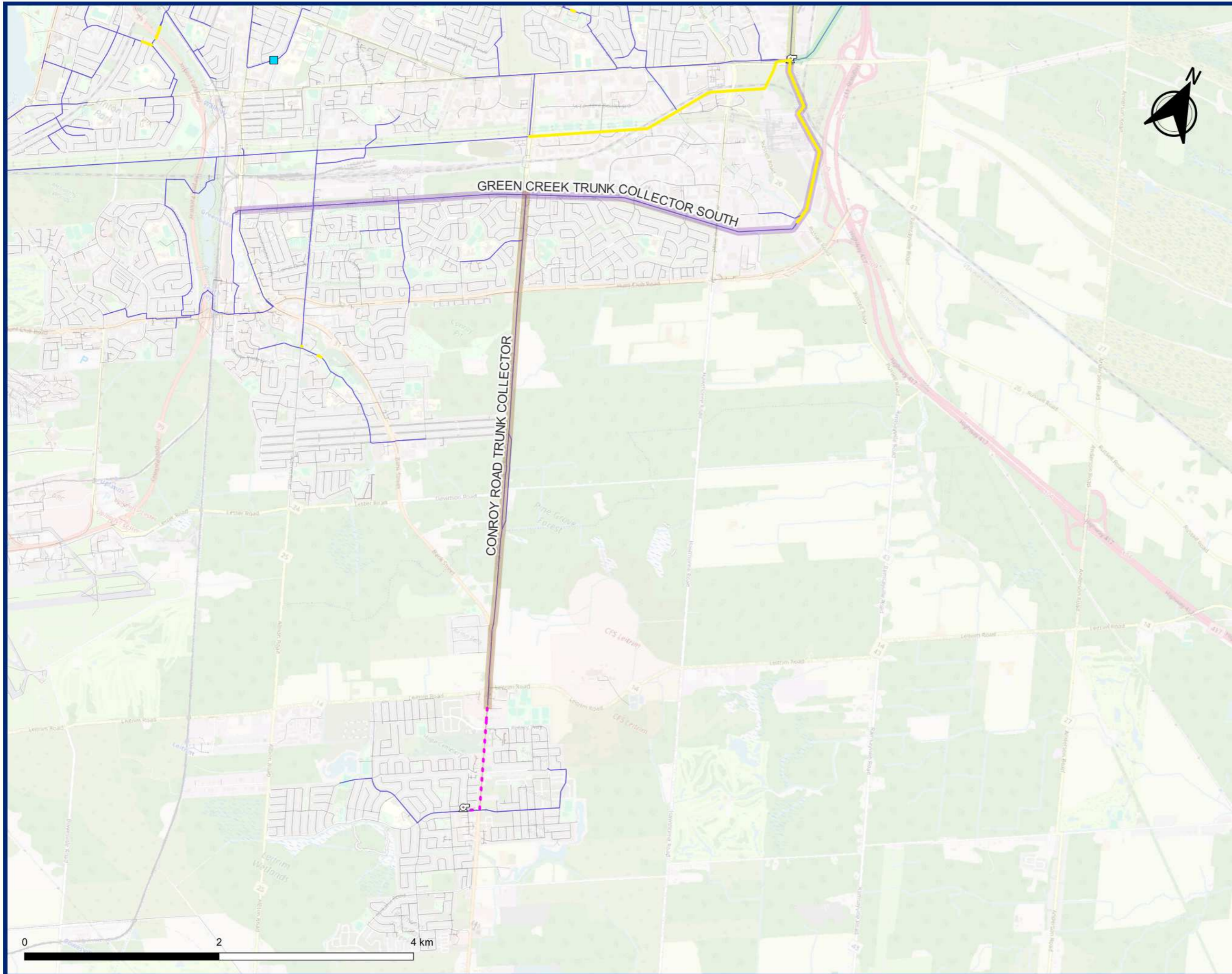
**Existing Sanitary Sewer Infrastructure (LINEAR)**

Network

- Gravity Sewer
- Forcemain
- Local Sewer

Figure 2-2  
Existing Conditions  
1-in-5-Year June 2014 Event  
**Leirrim**





OPA Urban Boundary Expansion  
Wastewater Infrastructure Assessment

### Trunk Sewers

- SOUTH OTTAWA TUNNEL
- CONROY ROAD TRUNK COLLECTOR
- GREEN CREEK TRUNK COLLECTOR NORTH
- GREEN CREEK TRUNK COLLECTOR SOUTH

### Modelling Results

Junctions (Maintenance Holes)

- Flooding
- HGL Near Surface (<1.8m Depth)

Conduits (Sewer Pipes)

- $d/D \geq 0.8$
- $q/Q \geq 1$

### Existing Sanitary Sewer Infrastructure (VERTICAL)

WW Facilities

- WWPS
- WWTP

### Existing Sanitary Sewer Infrastructure (LINEAR)

Network

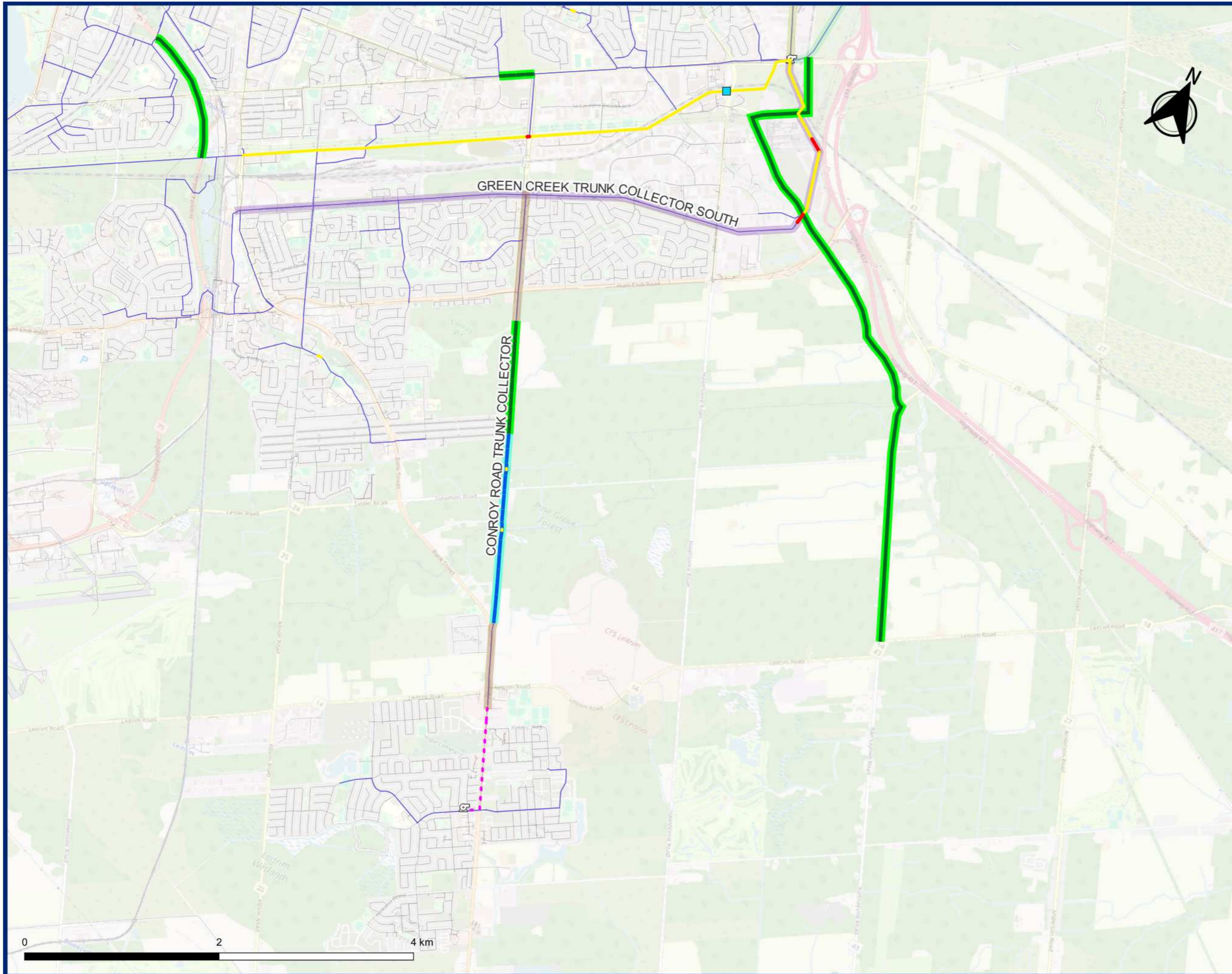
- Gravity Sewer
- Forcemain
- Local Sewer

Figure 2-3

Existing Conditions  
1-in-100-Year June 2014 Event  
**Leitrim**



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Projection EPSG:32189



OPA Urban Boundary Expansion  
Wastewater Infrastructure Assessment

### Trunk Sewers

- SOUTH OTTAWA TUNNEL
- CONROY ROAD TRUNK COLLECTOR
- GREEN CREEK TRUNK COLLECTOR NORTH
- GREEN CREEK TRUNK COLLECTOR SOUTH

### Modelling Results

Junctions (Maintenance Holes)

- Flooding
- HGL Near Surface (<1.8m Depth)

Conduits (Sewer Pipes)

- $d/D \geq 0.8$
- $q/Q \geq 1$

### Existing Sanitary Sewer Infrastructure (VERTICAL)

WW Facilities

- WWPS
- WWTP

### Existing Sanitary Sewer Infrastructure (LINEAR)

Network

- Gravity Sewer
- Forcemain
- Local Sewer

### Future Sanitary Sewer Infrastructure

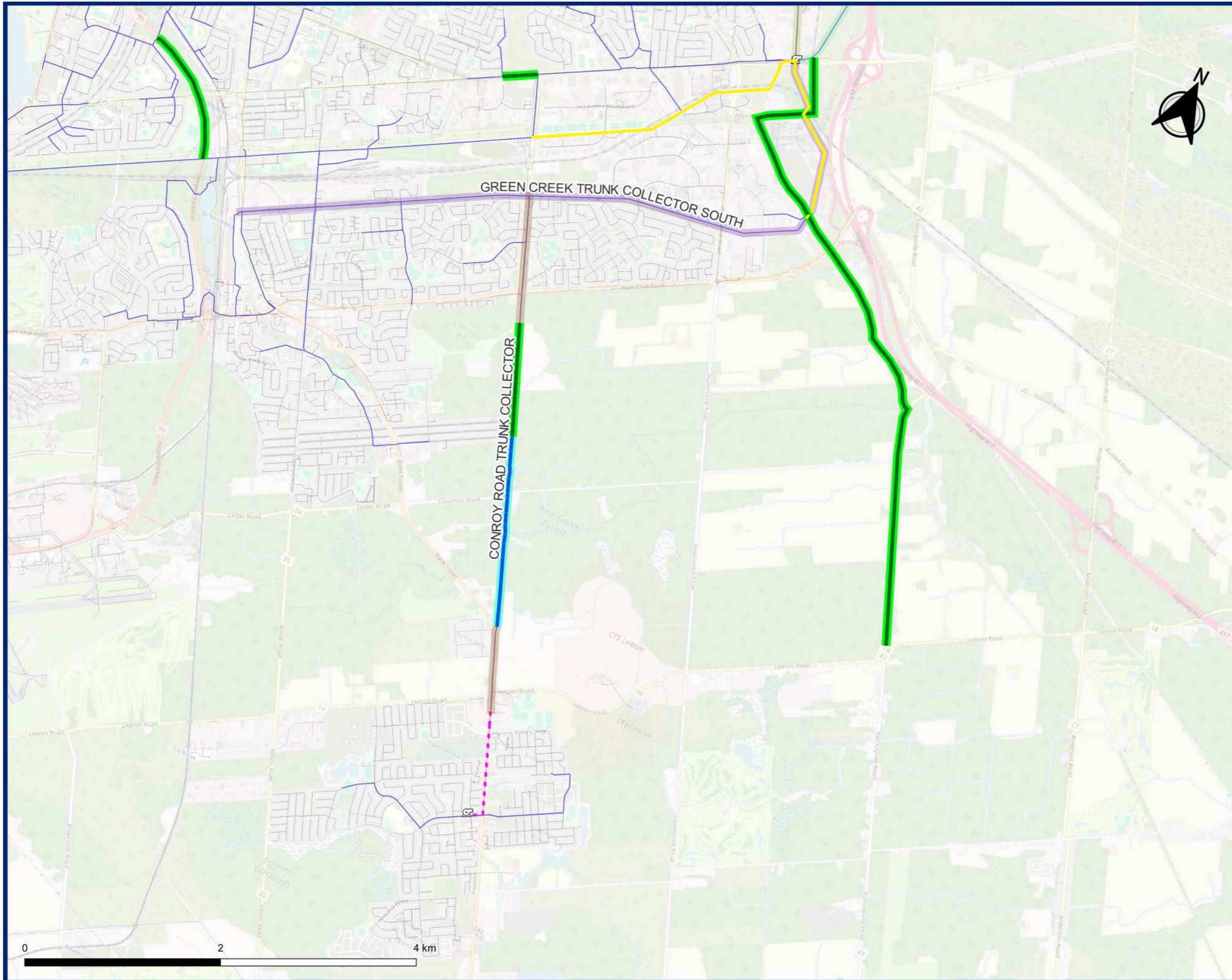
- 2013 Capital Project
- 2046 Capital Project

Figure 3-1

Future Conditions (no Leitrim)  
1-in-25-Year June 2014 Event  
**Leitrim**



July, 2025  
2501074-WW-003  
Projection EPSG:32189



### Trunk Sewers

- SOUTH OTTAWA TUNNEL
- CONROY ROAD TRUNK COLLECTOR
- GREEN CREEK TRUNK COLLECTOR NORTH
- GREEN CREEK TRUNK COLLECTOR SOUTH

### Modelling Results

Junctions (Maintenance Holes)

- Flooding
- HGL Near Surface (<1.8m Depth)

Conduits (Sewer Pipes)

- $d/D \geq 0.8$
- $q/Q \geq 1$

### Existing Sanitary Sewer Infrastructure (VERTICAL)

WW Facilities

- WWPS
- WWTP

### Existing Sanitary Sewer Infrastructure (LINEAR)

Network

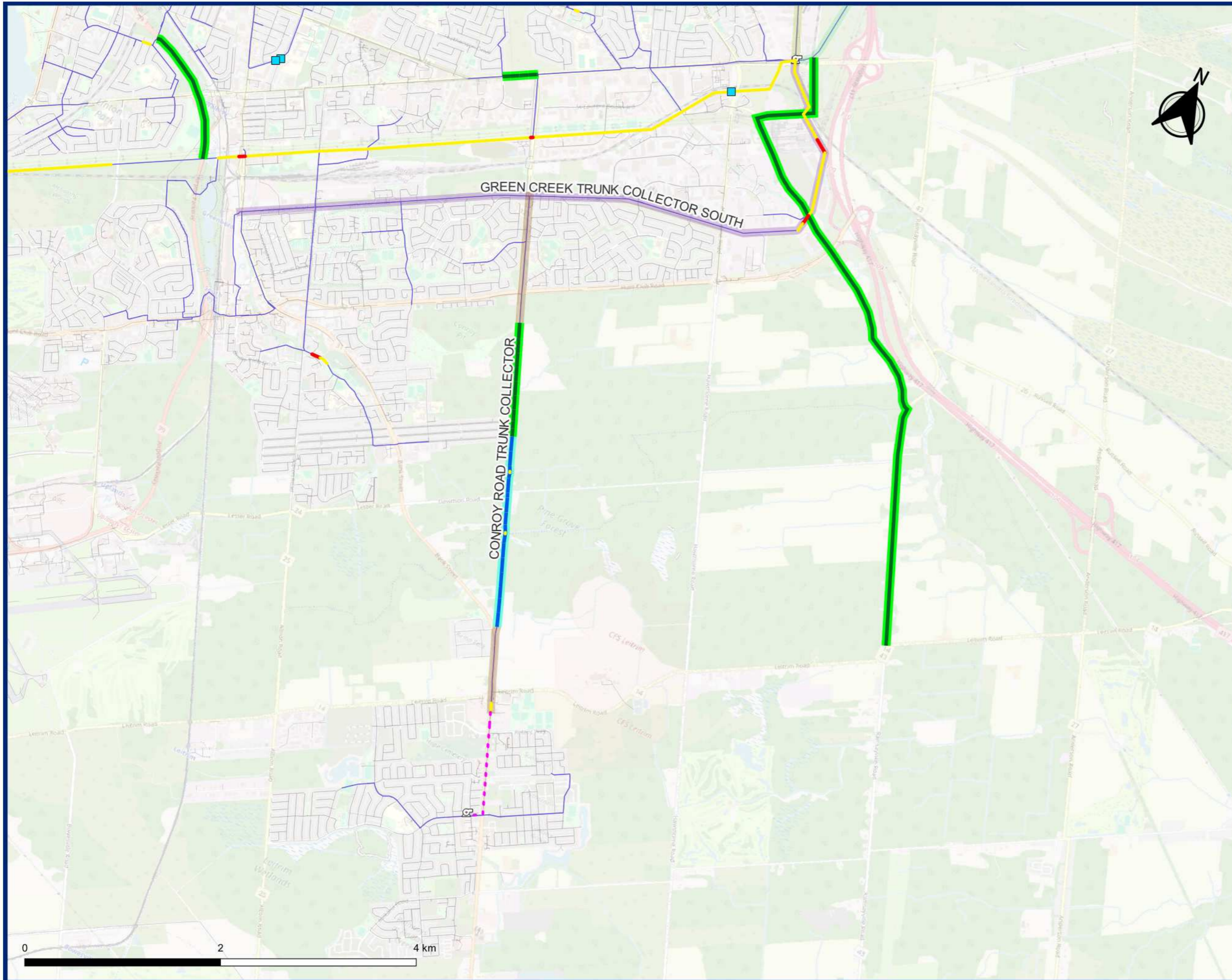
- Gravity Sewer
- Forcemain
- Local Sewer

### Future Sanitary Sewer Infrastructure

- 2013 Capital Project
- 2046 Capital Project

Figure 3-2

**Future Conditions (no Leitrim)**  
**1-in-5-Year June 2014 Event**  
**Leitrim**



### Trunk Sewers

- SOUTH OTTAWA TUNNEL
- CONROY ROAD TRUNK COLLECTOR
- GREEN CREEK TRUNK COLLECTOR NORTH
- GREEN CREEK TRUNK COLLECTOR SOUTH

### Modelling Results

#### Junctions (Maintenance Holes)

- Flooding
- HGL Near Surface (<1.8m Depth)

#### Conduits (Sewer Pipes)

- $d/D \geq 0.8$
- $q/Q \geq 1$

### Existing Sanitary Sewer Infrastructure (VERTICAL)

#### WW Facilities

- WWPS
- WWTP

### Existing Sanitary Sewer Infrastructure (LINEAR)

#### Network

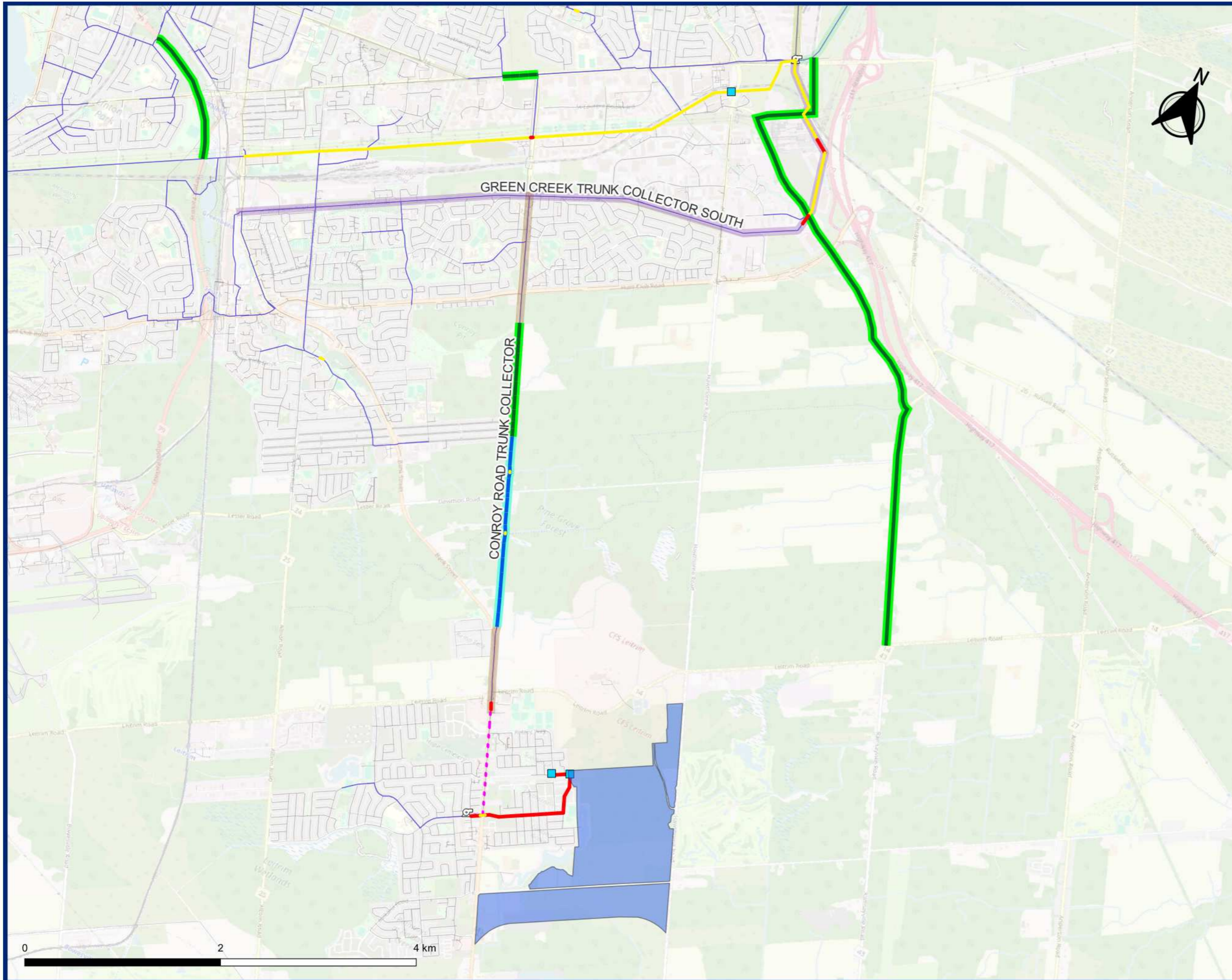
- Gravity Sewer
- Forcemain
- Local Sewer

### Future Sanitary Sewer Infrastructure

- 2013 Capital Project
- 2046 Capital Project

Figure 3-3

Future Conditions (no Leitrim)  
1-in-100-Year June 2014 Event  
**Leitrim**



### Expansion Area

Leitrim

### Trunk Sewers

SOUTH OTTAWA TUNNEL  
CONROY ROAD TRUNK COLLECTOR  
GREEN CREEK TRUNK COLLECTOR NORTH  
GREEN CREEK TRUNK COLLECTOR SOUTH

### Modelling Results

Junctions (Maintenance Holes)

Flooding  
HGL Near Surface (<1.8m Depth)

Conduits (Sewer Pipes)

$d/D \geq 0.8$   
 $q/Q \geq 1$

### Existing Sanitary Sewer Infrastructure (VERTICAL)

WW Facilities

WWPS  
WWTP

### Existing Sanitary Sewer Infrastructure (LINEAR)

Network

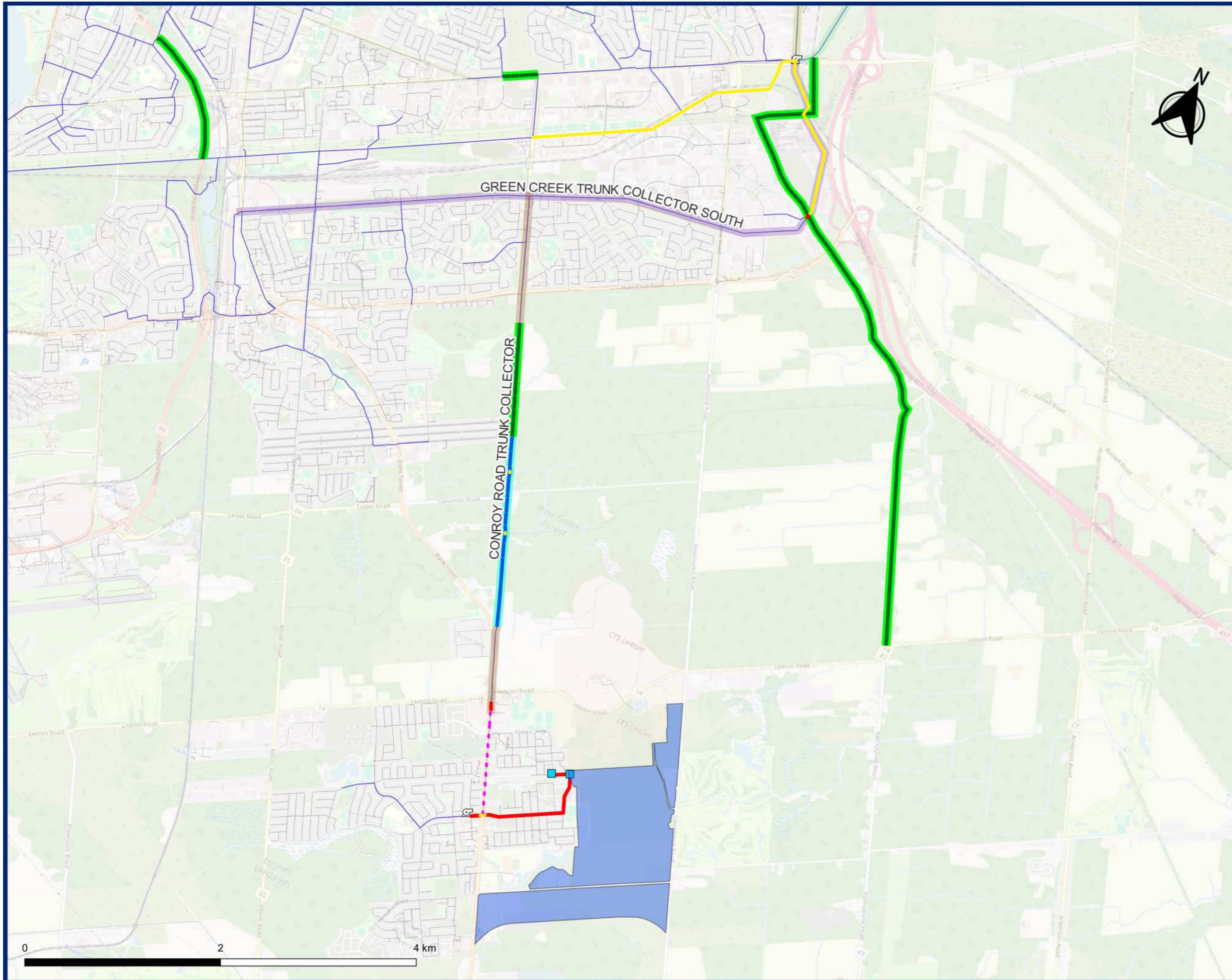
Gravity Sewer  
Forcemain  
Local Sewer

### Future Sanitary Sewer Infrastructure

2013 Capital Project  
2046 Capital Project

Figure 4-1

Future Conditions (with Leitrim)  
1-in-25-Year June 2014 Event  
**Leitrim**



### Expansion Area

Leitrim

### Trunk Sewers

SOUTH OTTAWA TUNNEL  
CONROY ROAD TRUNK COLLECTOR  
GREEN CREEK TRUNK COLLECTOR NORTH  
GREEN CREEK TRUNK COLLECTOR SOUTH

### Modelling Results

Junctions (Maintenance Holes)

Flooding  
HGL Near Surface (<1.8m Depth)

Conduits (Sewer Pipes)

$d/D \geq 0.8$   
 $q/Q \geq 1$

### Existing Sanitary Sewer Infrastructure (VERTICAL)

WW Facilities

WWPS  
WWTP

### Existing Sanitary Sewer Infrastructure (LINEAR)

Network

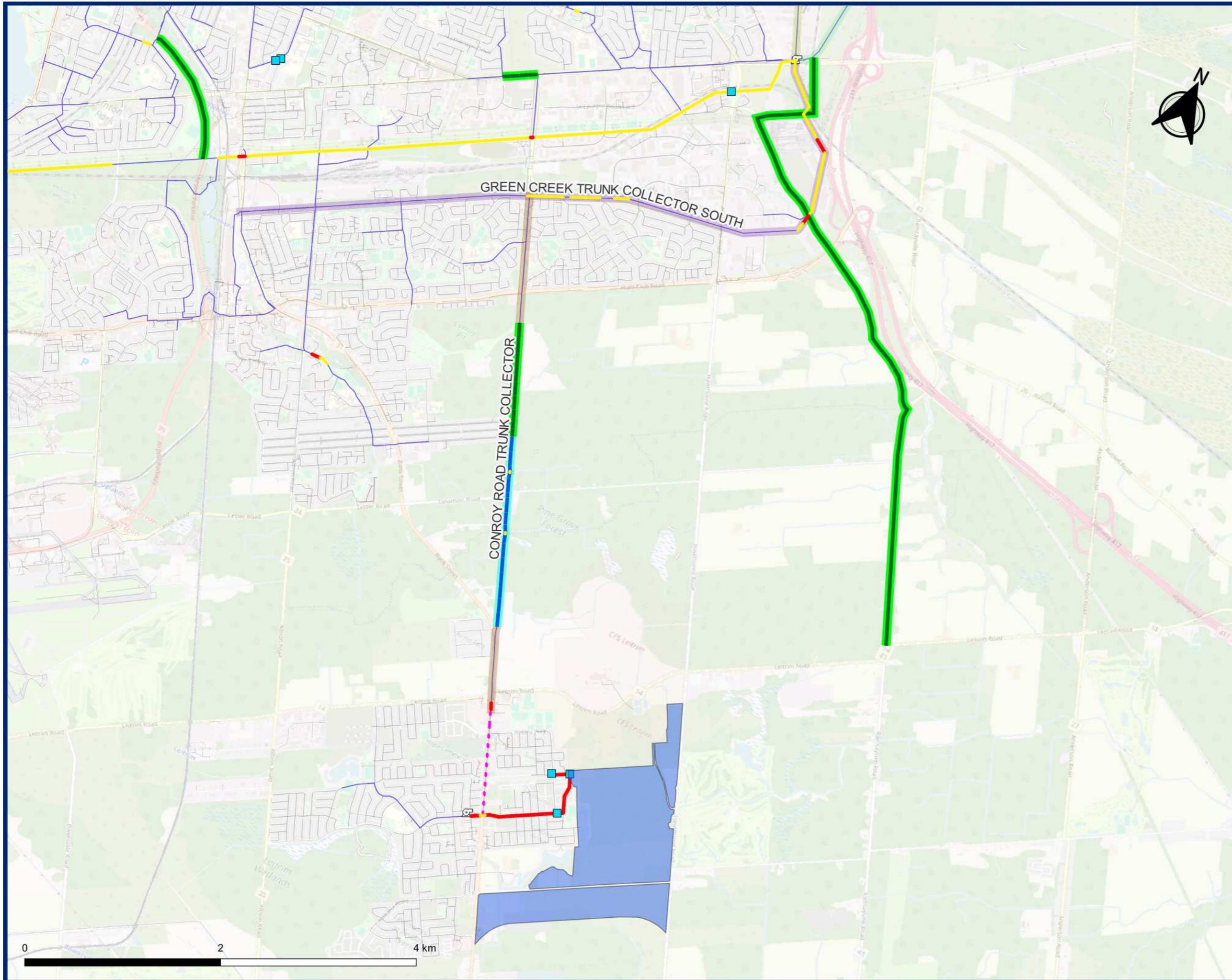
Gravity Sewer  
Forcemain  
Local Sewer

### Future Sanitary Sewer Infrastructure

2013 Capital Project  
2046 Capital Project

Figure 4-2

Future Conditions (with Leitrim)  
1-in-5-Year June 2014 Event  
**Leitrim**



### Expansion Area

Leitrim

### Trunk Sewers

SOUTH OTTAWA TUNNEL  
CONROY ROAD TRUNK COLLECTOR  
GREEN CREEK TRUNK COLLECTOR NORTH  
GREEN CREEK TRUNK COLLECTOR SOUTH

### Modelling Results

Junctions (Maintenance Holes)

□ Flooding  
● HGL Near Surface (<1.8m Depth)

Conduits (Sewer Pipes)

—  $d/D \geq 0.8$   
—  $q/Q \geq 1$

### Existing Sanitary Sewer Infrastructure (VERTICAL)

WW Facilities

□ WWPS  
◆ WWTP

### Existing Sanitary Sewer Infrastructure (LINEAR)

Network

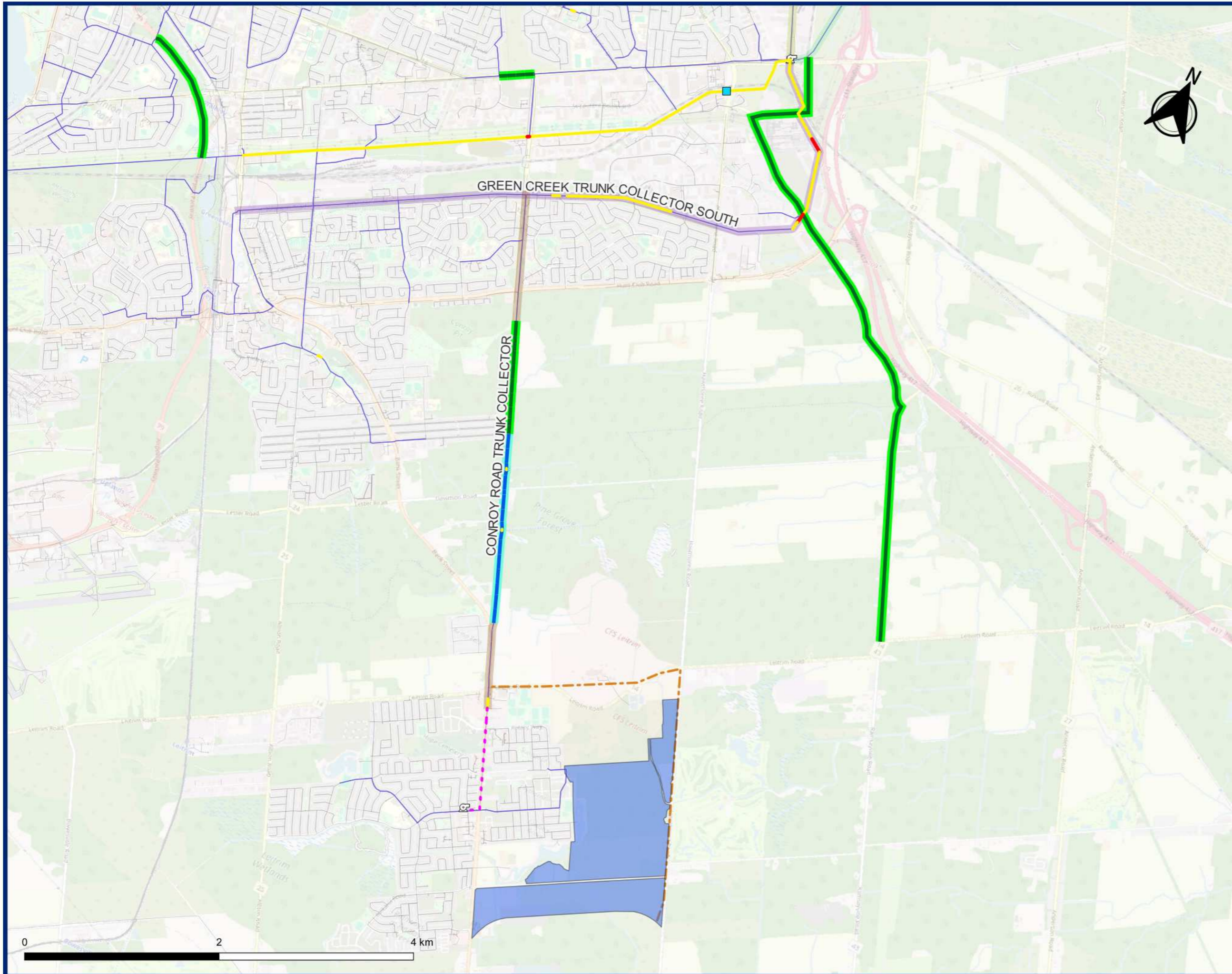
— Gravity Sewer  
- - - Forcemain  
— Local Sewer

### Future Sanitary Sewer Infrastructure

— 2013 Capital Project  
— 2046 Capital Project

Figure 4-3

Future Conditions (with Leitrim)  
1-in-100-Year June 2014 Event  
**Leitrim**



OPA Urban Boundary Expansion  
Wastewater Infrastructure Assessment

**Expansion Area**

Leitrim

**Servicing Solution**

On-site Pumping Station

**Trunk Sewers**

SOUTH OTTAWA TUNNEL  
CONROY ROAD TRUNK COLLECTOR  
GREEN CREEK TRUNK COLLECTOR NORTH  
GREEN CREEK TRUNK COLLECTOR SOUTH

**Modelling Results**

Junctions (Maintenance Holes)  
Flooding  
HGL Near Surface (<1.8m Depth)

Conduits (Sewer Pipes)  
d/D  $\geq 0.8$   
q/Q  $\geq 1$

**Existing Sanitary Sewer Infrastructure (VERTICAL)**

WW Facilities  
WWPS  
WWTP

**Existing Sanitary Sewer Infrastructure (LINEAR)**

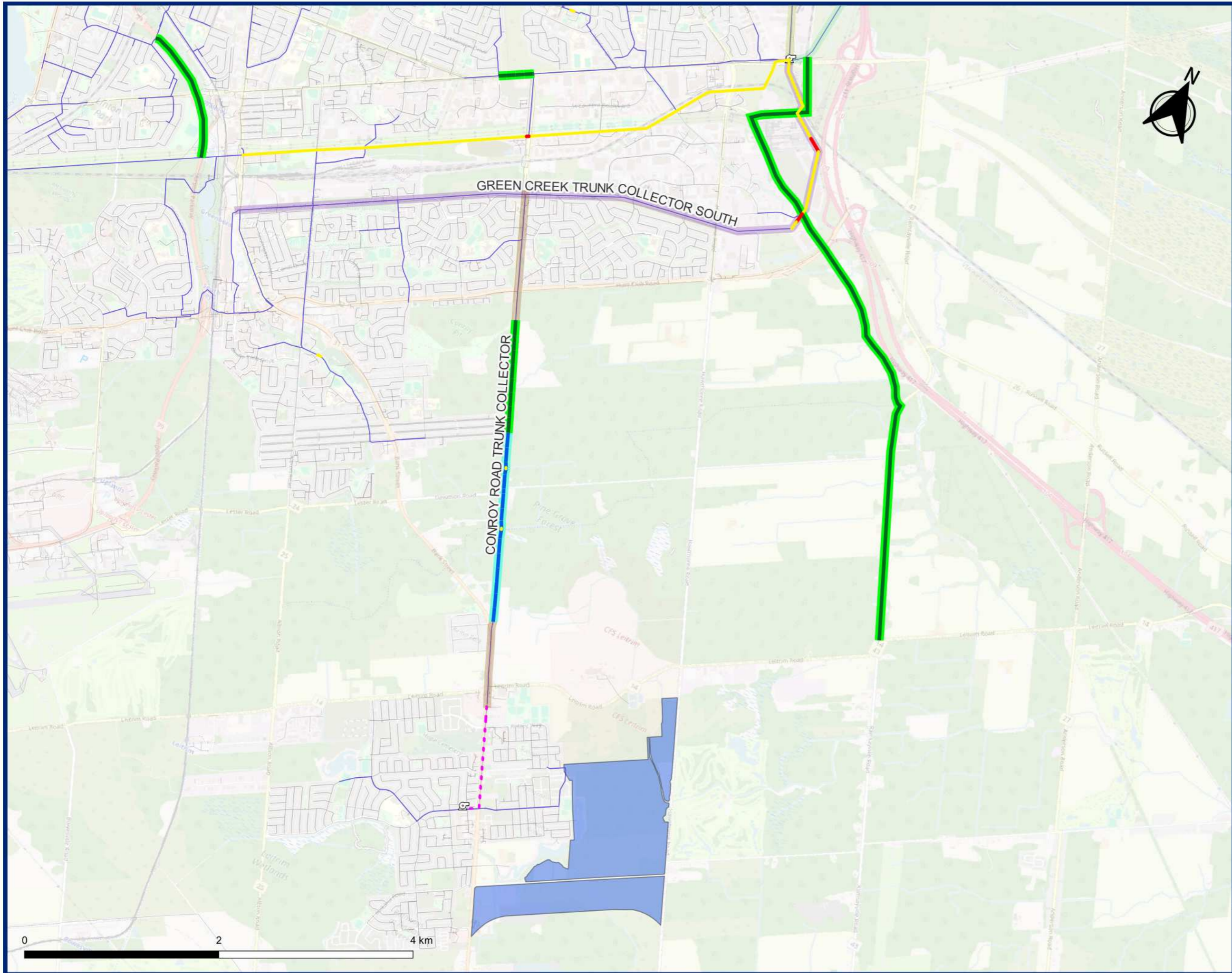
Network  
Gravity Sewer  
Forcemain  
Local Sewer

**Future Sanitary Sewer Infrastructure**

2013 Capital Project  
2046 Capital Project

Figure 5-1  
Future Conditions (Servicing Solutions)  
1-in-25-Year June 2014 Event  
**Leitrim**





OPA Urban Boundary Expansion  
Wastewater Infrastructure Assessment

**Expansion Area**

Leitrim

**Servicing Solution**

On-site Pumping Station

**Trunk Sewers**

SOUTH OTTAWA TUNNEL

CONROY ROAD TRUNK COLLECTOR

GREEN CREEK TRUNK COLLECTOR NORTH

GREEN CREEK TRUNK COLLECTOR SOUTH

**Modelling Results**

Junctions (Maintenance Holes)

Flooding

HGL Near Surface (<1.8m Depth)

Conduits (Sewer Pipes)

d/D  $\geq 0.8$

q/Q  $\geq 1$

**Existing Sanitary Sewer Infrastructure (VERTICAL)**

WW Facilities

WWPS

WWTP

**Existing Sanitary Sewer Infrastructure (LINEAR)**

Network

Gravity Sewer

Forcemain

Local Sewer

**Future Sanitary Sewer Infrastructure**

2013 Capital Project

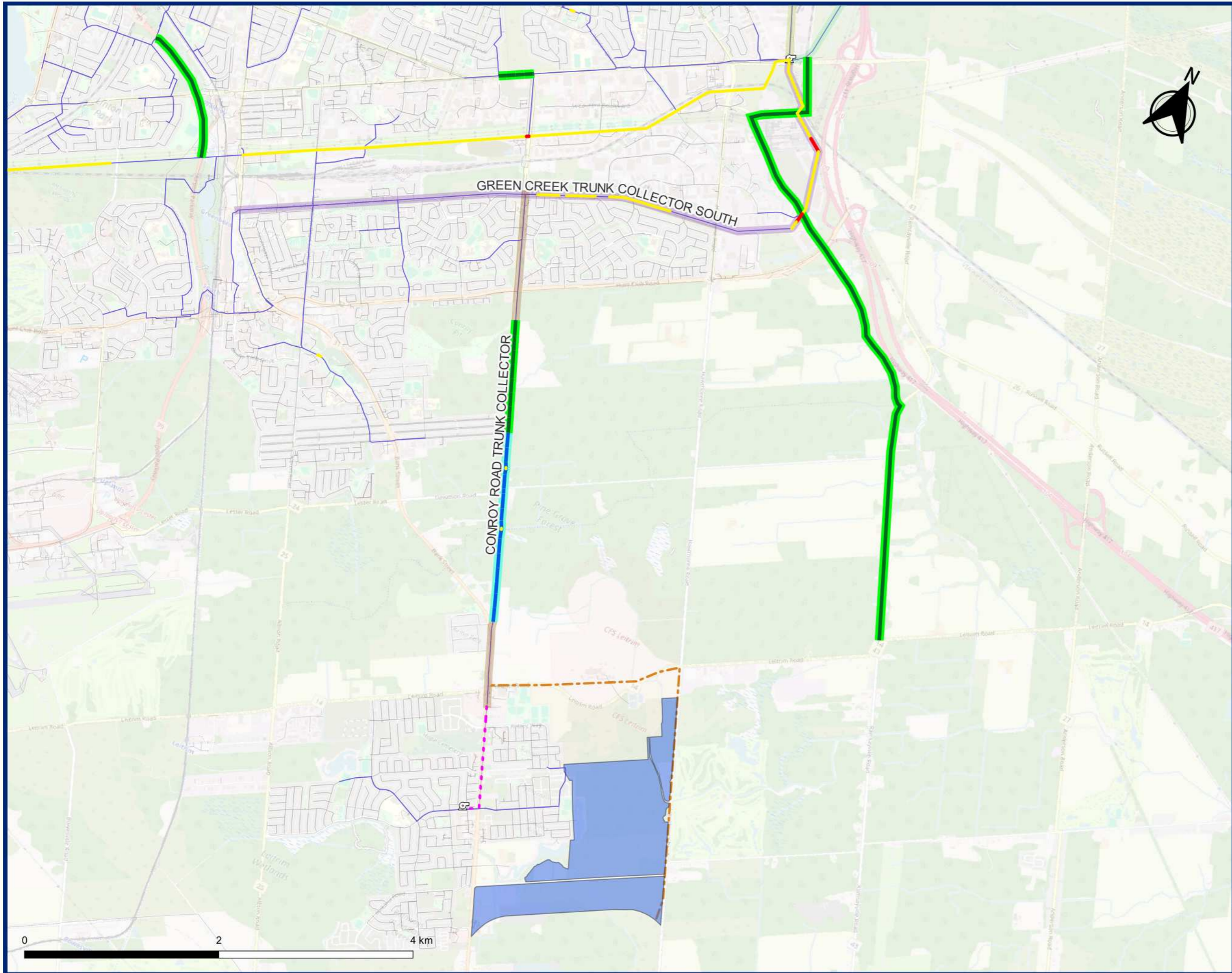
2046 Capital Project

Figure 5-2

**Future Conditions (Servicing Solutions)**  
**1-in-5-Year June 2014 Event**  
**Leitrim**



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Projection EPSG:32189



**Expansion Area**

Leitrim

**Servicing Solution**

On-site Pumping Station

**Trunk Sewers**

SOUTH OTTAWA TUNNEL

CONROY ROAD TRUNK COLLECTOR

GREEN CREEK TRUNK COLLECTOR NORTH

GREEN CREEK TRUNK COLLECTOR SOUTH

**Modelling Results**

Junctions (Maintenance Holes)

Flooding

HGL Near Surface (<1.8m Depth)

Conduits (Sewer Pipes)

d/D  $\geq$  0.8

q/Q  $\geq$  1

**Existing Sanitary Sewer Infrastructure (VERTICAL)**

WW Facilities

WWPS

WWTP

**Existing Sanitary Sewer Infrastructure (LINEAR)**

Network

Gravity Sewer

Forcemain

Local Sewer

**Future Sanitary Sewer Infrastructure**

2013 Capital Project

2046 Capital Project

Figure 5-3

**Future Conditions (Servicing Solutions)**  
**1-in-100-Year June 2014 Event**  
**Leitrim**