

## PHASE ONE MAPS - NOSE CREEK / WEST NOSE CREEK

## RIPARIAN AREAS MAPPING PROJECT FOR THE CITY OF CALGARY

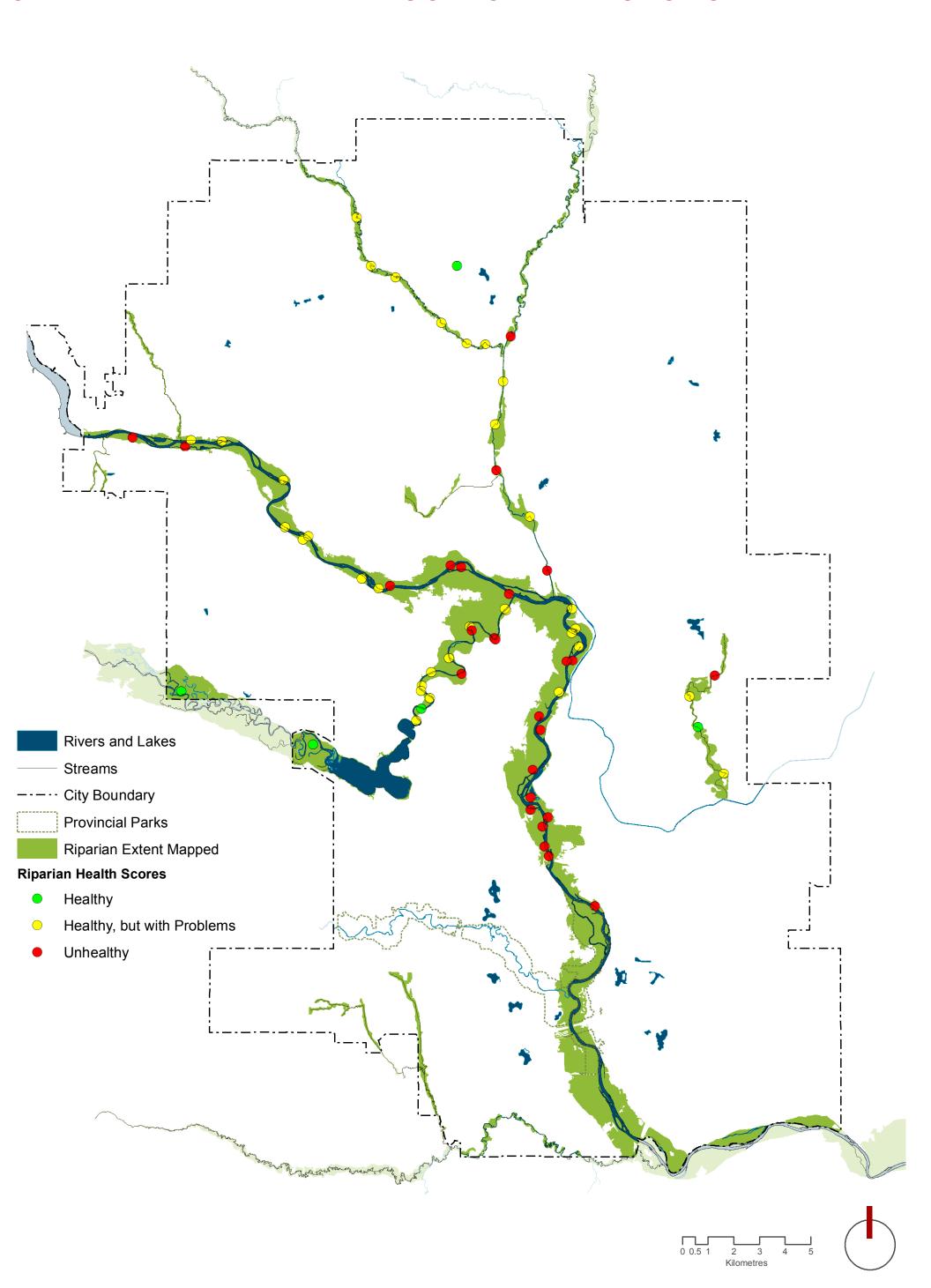
Prepared by: O2 Planning + Design Inc. with The Alberta Riparian Habitat Management Society (Cows and Fish)

Submitted to: The City of Calgary Water Resources

October 19 | 2012

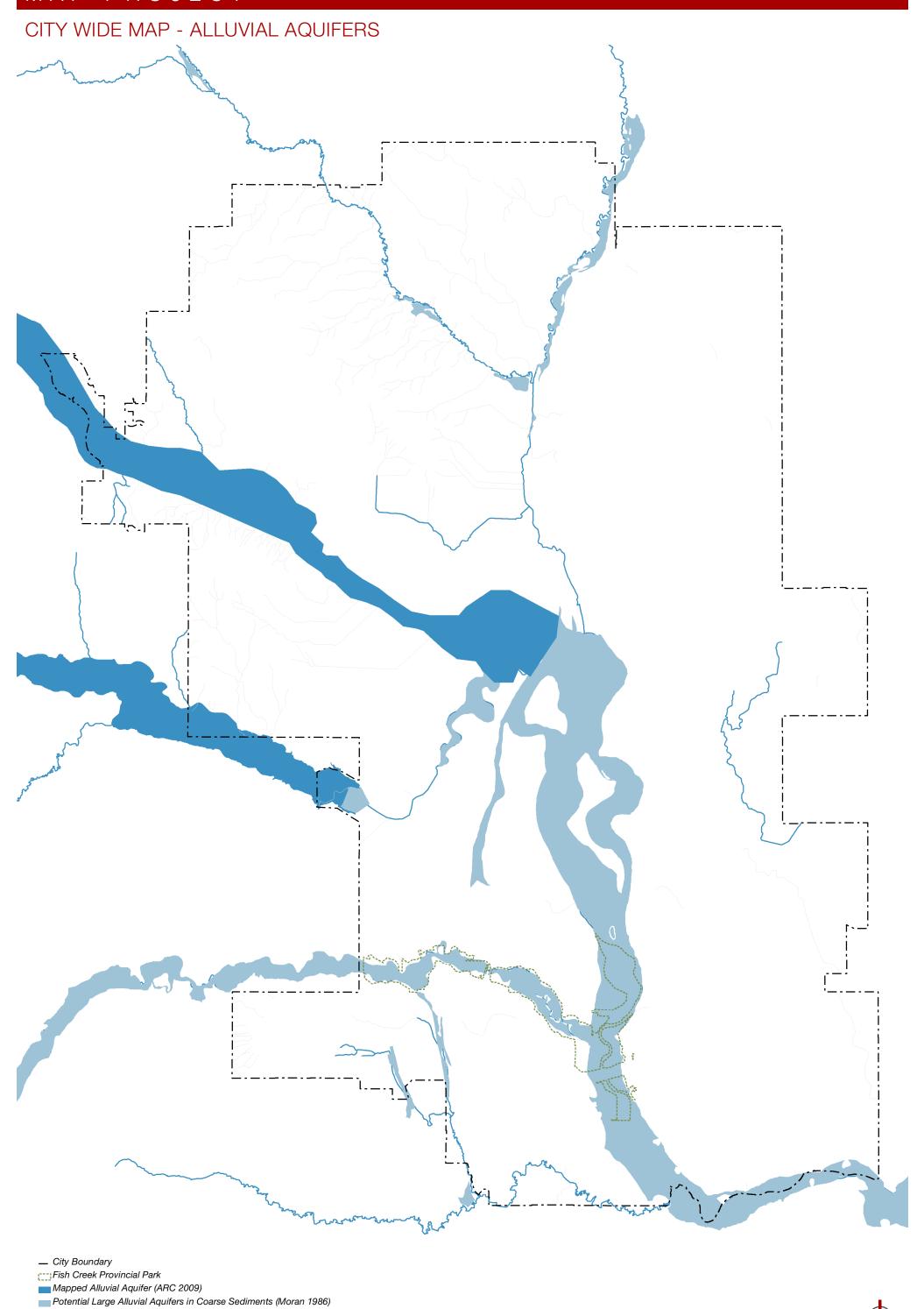


## CITY WIDE MAP - RIPARIAN LOCATION AND FUNCTION

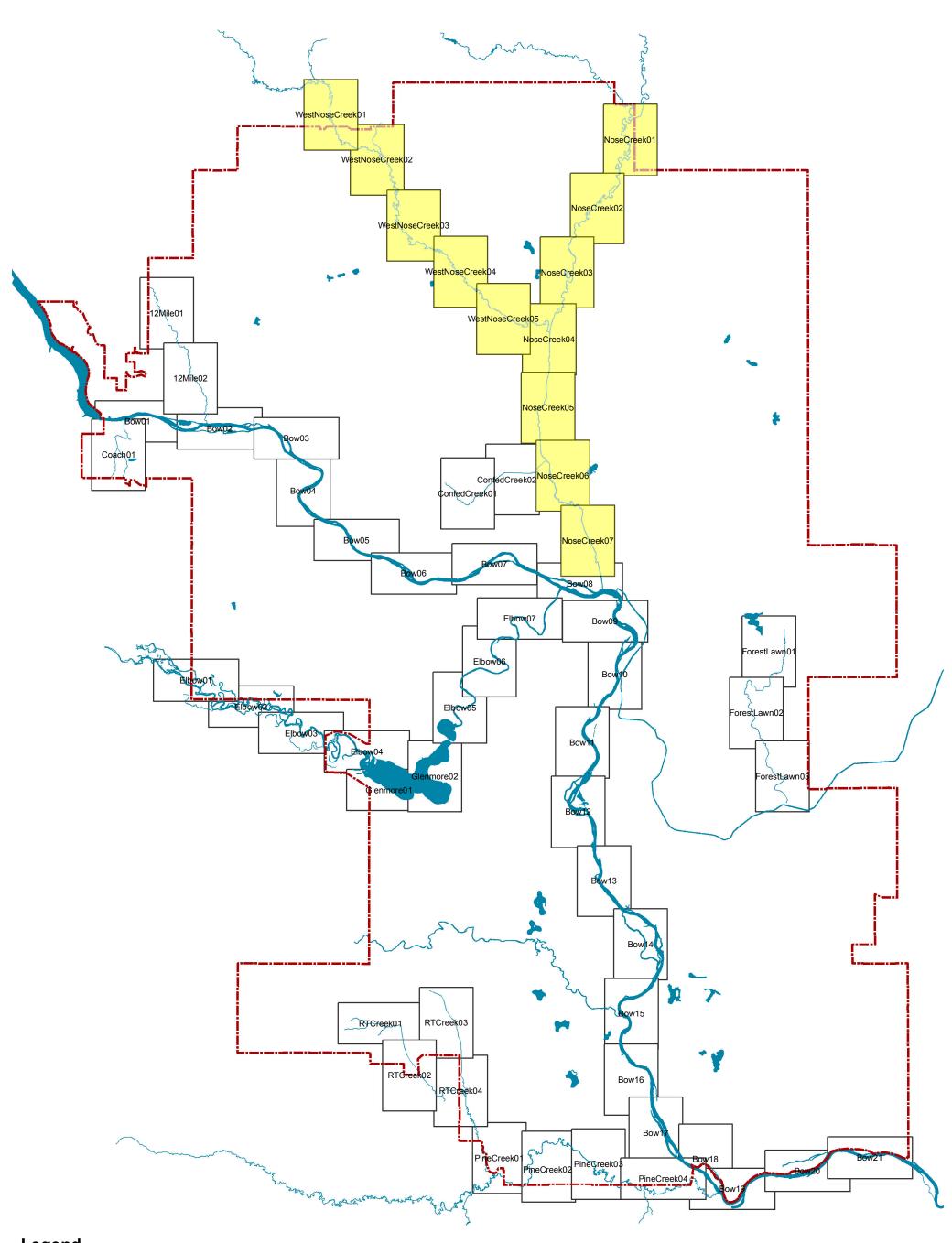


## RIPARIAN AREAS MAP PROJECT

\_\_\_Streams / Rivers \_\_Lower Order Streams



### CITY WIDE MAP - MAP BLOCK CODE



### Legend

Map Block Code ID

City of Calgary Boundary

Water Surface

0 0.5 1 2 3 4 5

Kilometres



## \*Variable Width Riparian Model Outputs

Inner Riparian Zone

Middle Riparian Zone

Outer Riparian Zone

Potential Outermost Riparian Zone

Healthy, but with Problems

Good

Poor

Moderate

\*\*\*Based on field studies of major rivers / creeks, excluding private residential riverfront lots or steep valley slopes with limited riparian habitat

Major Roads

Fish Creek Provincial Park

0 50 100

200

Metres

300

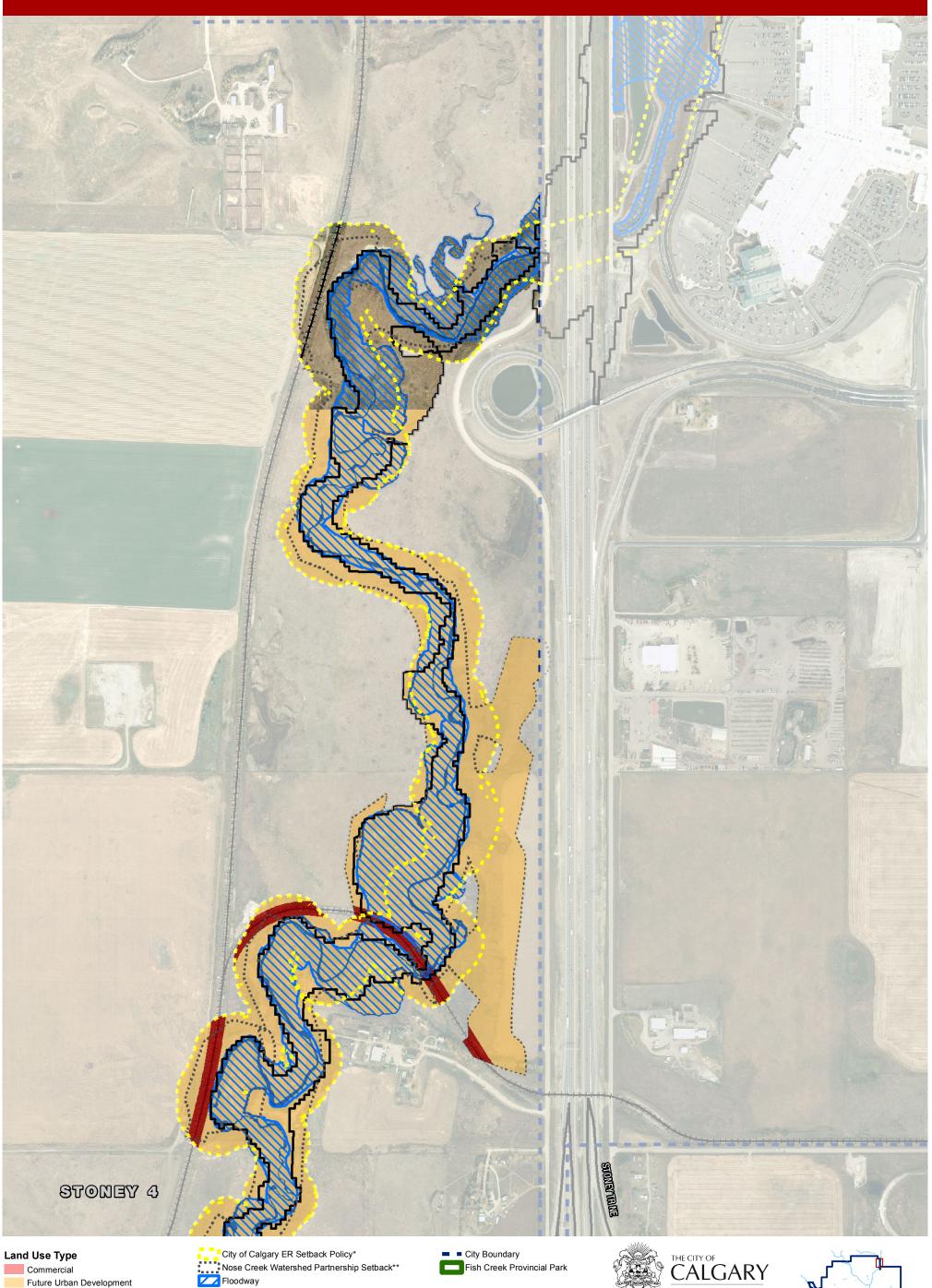
400

Streams

++++ Rail

Healthy

Unhealthy





Future Urban Development

Industrial Institutional

Major Infrastructure

Mixed Use Residential

Parks, Recreation and Public Education

Golf Course

Flood Fringe

Flood Extent - 100 Year (Nose Creek/West Nose Creek)

Outer Riparian Zone Boundary

Streams Major Roads

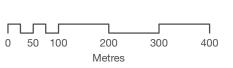
HH Rail

\*Note that ER setbacks for lower order streams are not mapped as they were out of the project scope

\*\*Recommended setback boundary of Nose Creek Watershed Partnership including floodplain, meander belt width and adjacent escarpments >15%

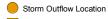












Stormwater Lift Station Storm Main (>900mm diameter)

Sanitary Main (>600mm diameter)

Water Main (>400mm diameter) - - Siphon

Pipeline River Crossing Locations Mater / Waste Water Treament Plants

Existing Storm Retrofit Pond Possible Location of Storm Retrofit Pond

■ Bank Erosion Hotspot

Existing Bank Infrastructure (e.g., Rip Rap, Retaining Walls, Weirs)

= Bridge

Buildings Parks (Maintained Turf Areas)

City Boundary

Major Roads

HH Rail

Paved Trails **Gravel Trails** 

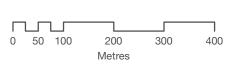
Streams Fish Creek Provincial Park The non-masked area is based on the greater of:

(i) outer riparian zone of the variable width model, (ii) City ER setback policy boundary, (iii) Nose Creek Watershed Partnership recommended setback policy

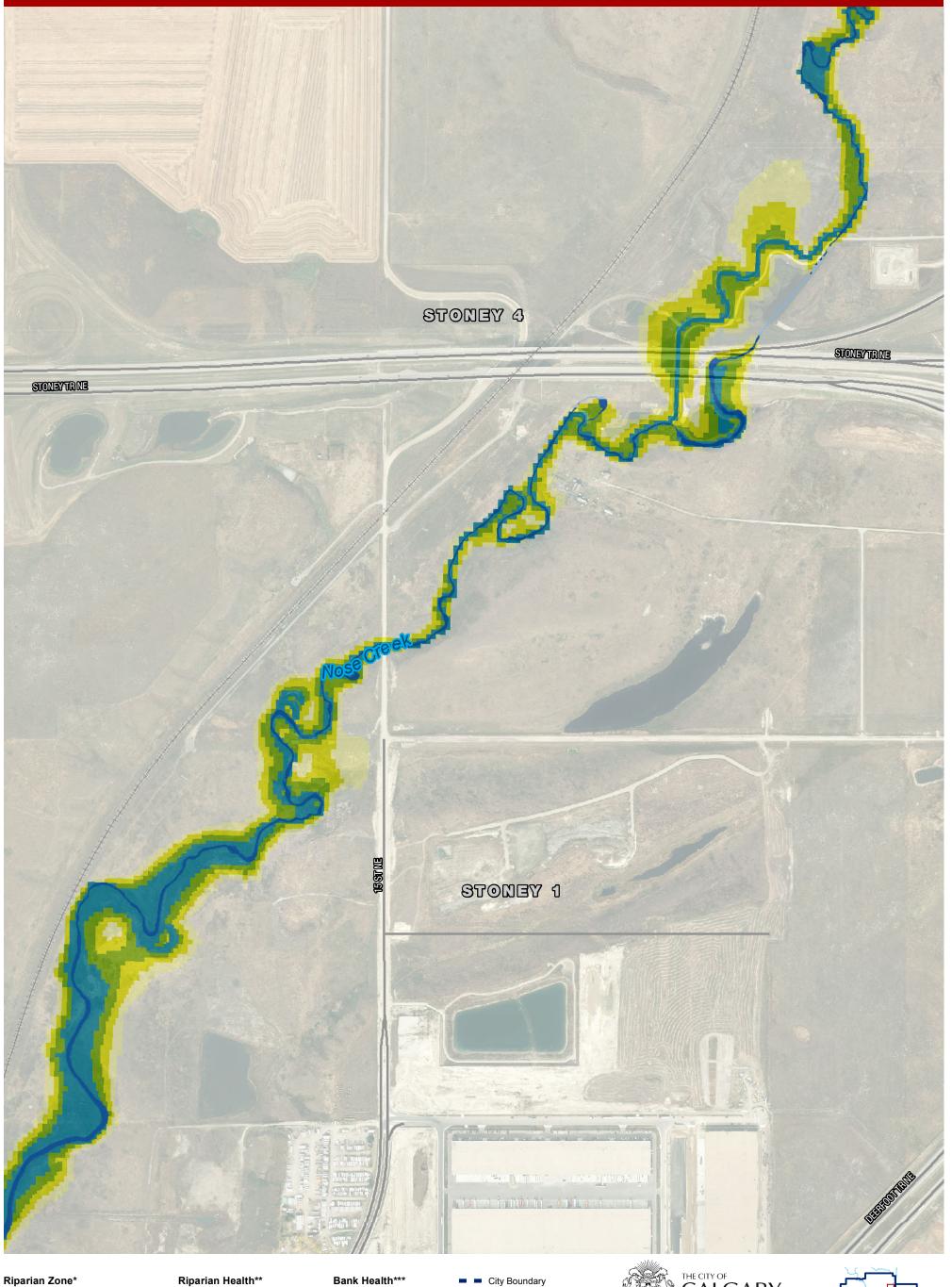
(See Theme 2-Land and Regulatory Issues)











Inner Riparian Zone

Middle Riparian Zone

Outer Riparian Zone

Potential Outermost Riparian Zone

Healthy, but with Problems

Healthy

Unhealthy

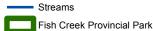
Good

Moderate Poor

\*\*\*Based on field studies of major rivers / creeks, excluding private residential riverfront lots or steep valley slopes with limited riparian habitat







0 50 100

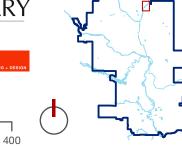


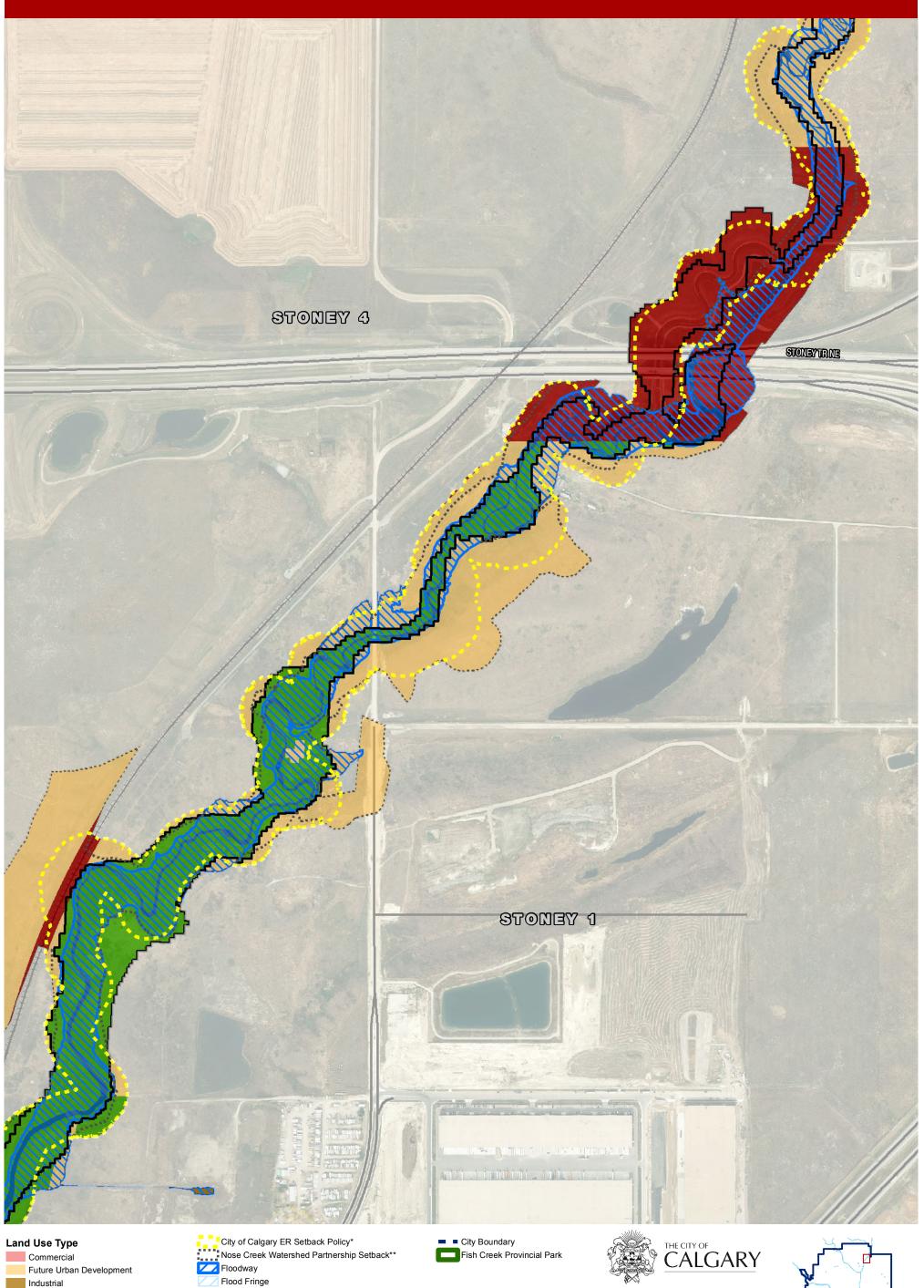


300

200

Metres





Mixed Use Residential Parks, Recreation and Public Education Golf Course

Institutional

Major Infrastructure

Flood Extent - 100 Year (Nose Creek/West Nose Creek)

Outer Riparian Zone Boundary

Streams Major Roads

HH Rail

\*Note that ER setbacks for lower order streams are not mapped as they were out of the project scope

\*\*Recommended setback boundary of Nose Creek Watershed Partnership including floodplain, meander belt width and adjacent escarpments >15%





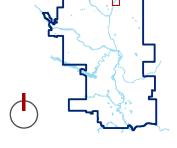
300

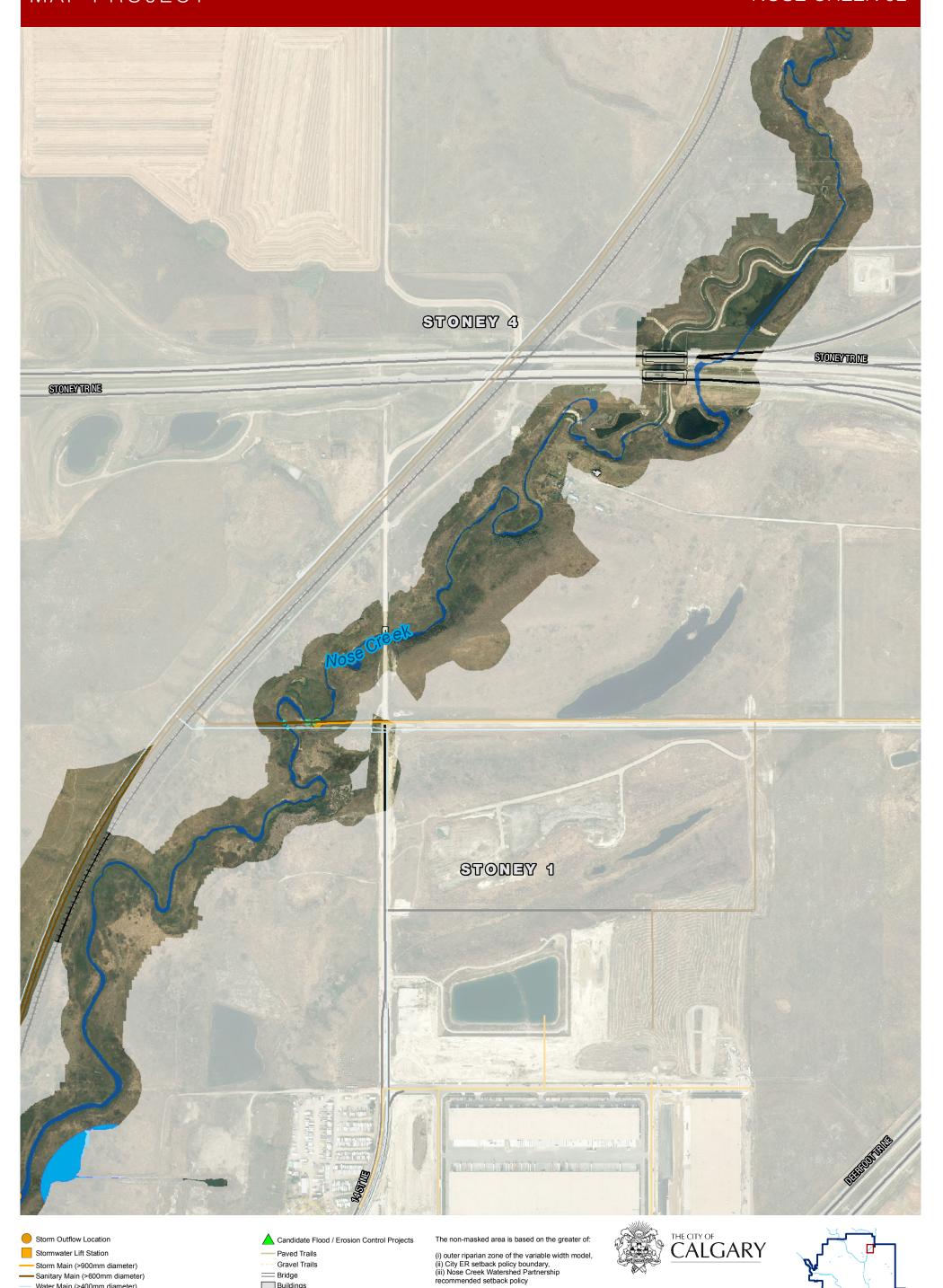
200

Metres

0 50 100

400





(See Theme 2-Land and Regulatory Issues)

0 50 100

200

Metres

300

400

Existing Storm Pond

Water Main (>400mm diameter)

Possible Location of Storm Retrofit Pond

Pipeline River Crossing Locations Mater / Waste Water Treament Plants Existing Storm Retrofit Pond

- - Siphon

Existing Bank Infrastructure (e.g., Rip Rap, Retaining Walls, Weirs) ■ Bank Erosion Hotspot

Buildings

City Boundary

Major Roads

HRail

Streams

Parks (Maintained Turf Areas)

Fish Creek Provincial Park



### Riparian Zone\*

Inner Riparian Zone

Middle Riparian Zone Outer Riparian Zone

Potential Outermost Riparian Zone

### Riparian Health\*\*

Healthy

Healthy, but with Problems Unhealthy

> major rivers / creeks, excluding private residential riverfront lots or steep valley slopes with limited riparian habitat

Good

Poor

\*\*\*Based on field studies of

Moderate



Fish Creek Provincial Park

0 50 100

THE CITY OF CALGARY

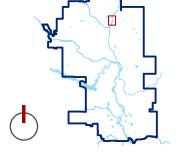


300

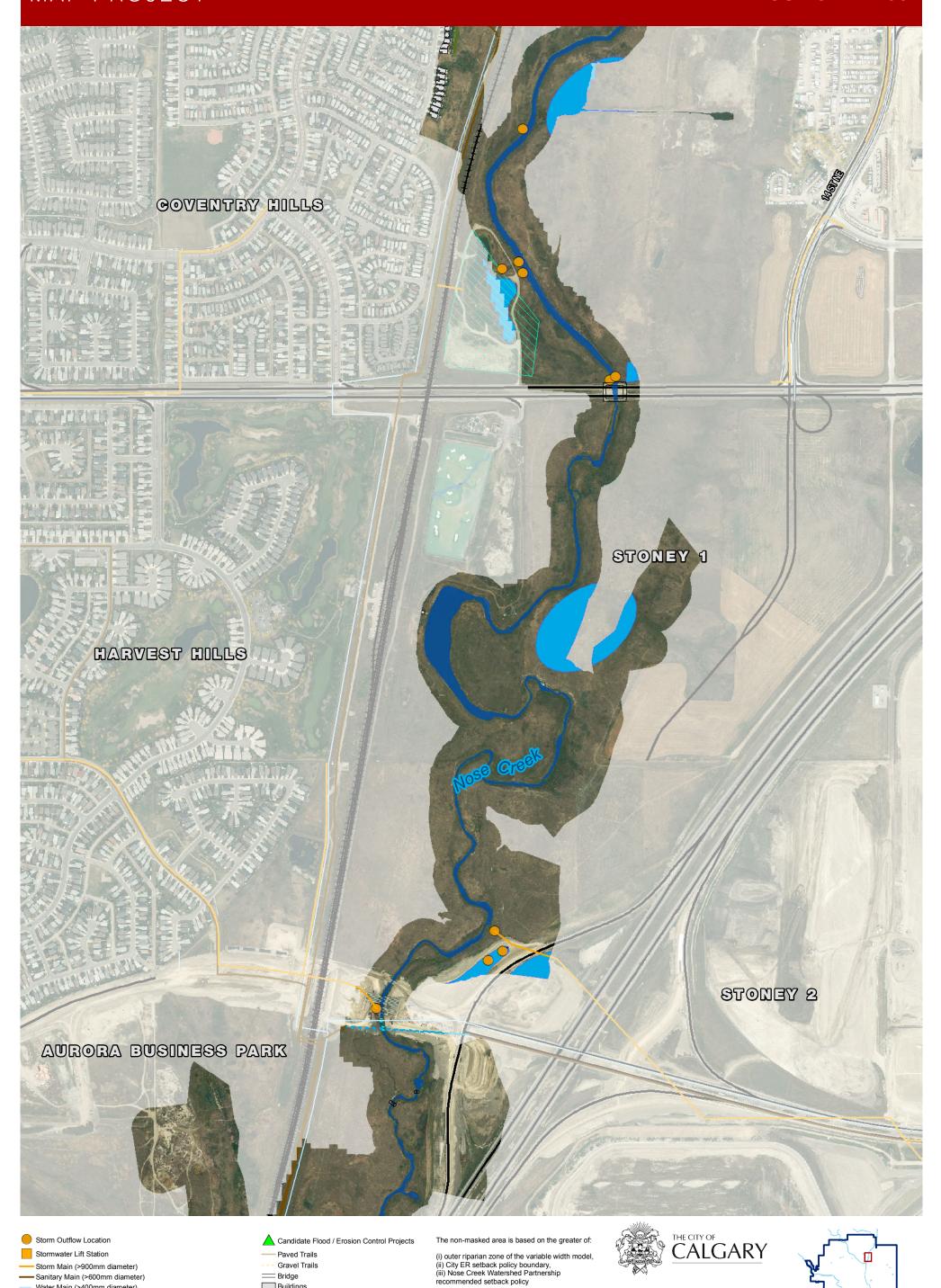
400

200

Metres



# Land Use Type Outer Riparian Zone Boundary Major Infrastructure Streams Mixed Use \*Note that ER setbacks for lower order streams are not mapped as they were out of the project scope Major Roads Residential HH Rail Parks, Recreation and Public Education \*\*Recommended setback boundary of Nose Creek Watershed Partnership including floodplain, meander belt width and adjacent escarpments >15% Golf Course 0 50 100 200 300 400 Metres



(See Theme 2-Land and Regulatory Issues)

0 50 100

300

200

Metres

400

Possible Location of Storm Retrofit Pond

Water Main (>400mm diameter)

Mater / Waste Water Treament Plants

Pipeline River Crossing Locations

Existing Storm Retrofit Pond

- - Siphon

■ Bank Erosion Hotspot

Existing Bank Infrastructure (e.g., Rip Rap, Retaining Walls, Weirs)

Buildings

<del>-----</del> Rail

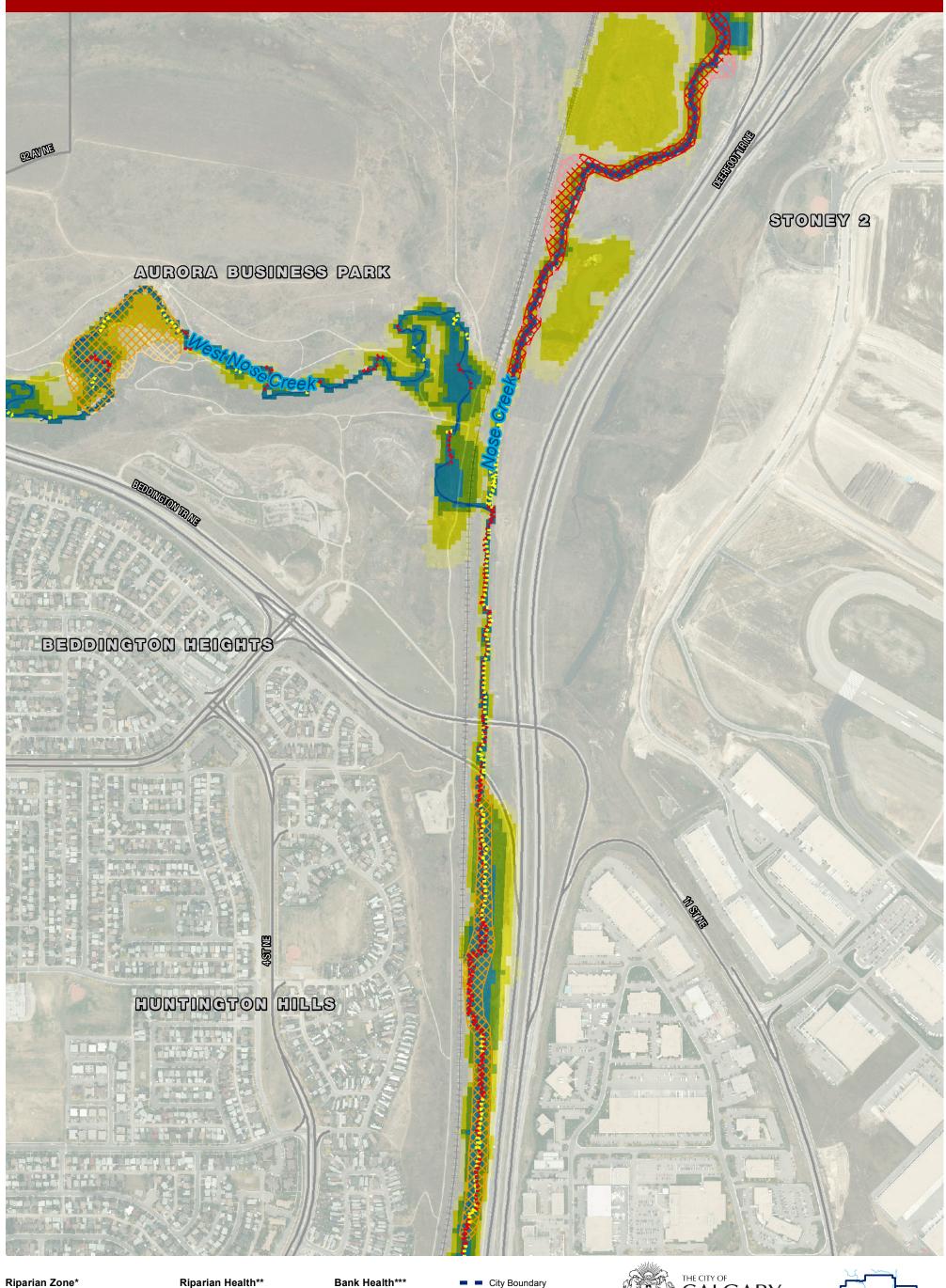
City Boundary

Streams

■ Major Roads

Parks (Maintained Turf Areas)

Fish Creek Provincial Park





Inner Riparian Zone

Middle Riparian Zone Outer Riparian Zone

Potential Outermost Riparian Zone

### Riparian Health\*\*

Healthy

Healthy, but with Problems Unhealthy

> \*\*\*Based on field studies of major rivers / creeks, excluding private residential riverfront lots or steep valley slopes with limited riparian habitat

Good

Poor

Moderate

### City Boundary

Major Roads

<del>⊢</del> Rail

Streams Fish Creek Provincial Park

0 50 100

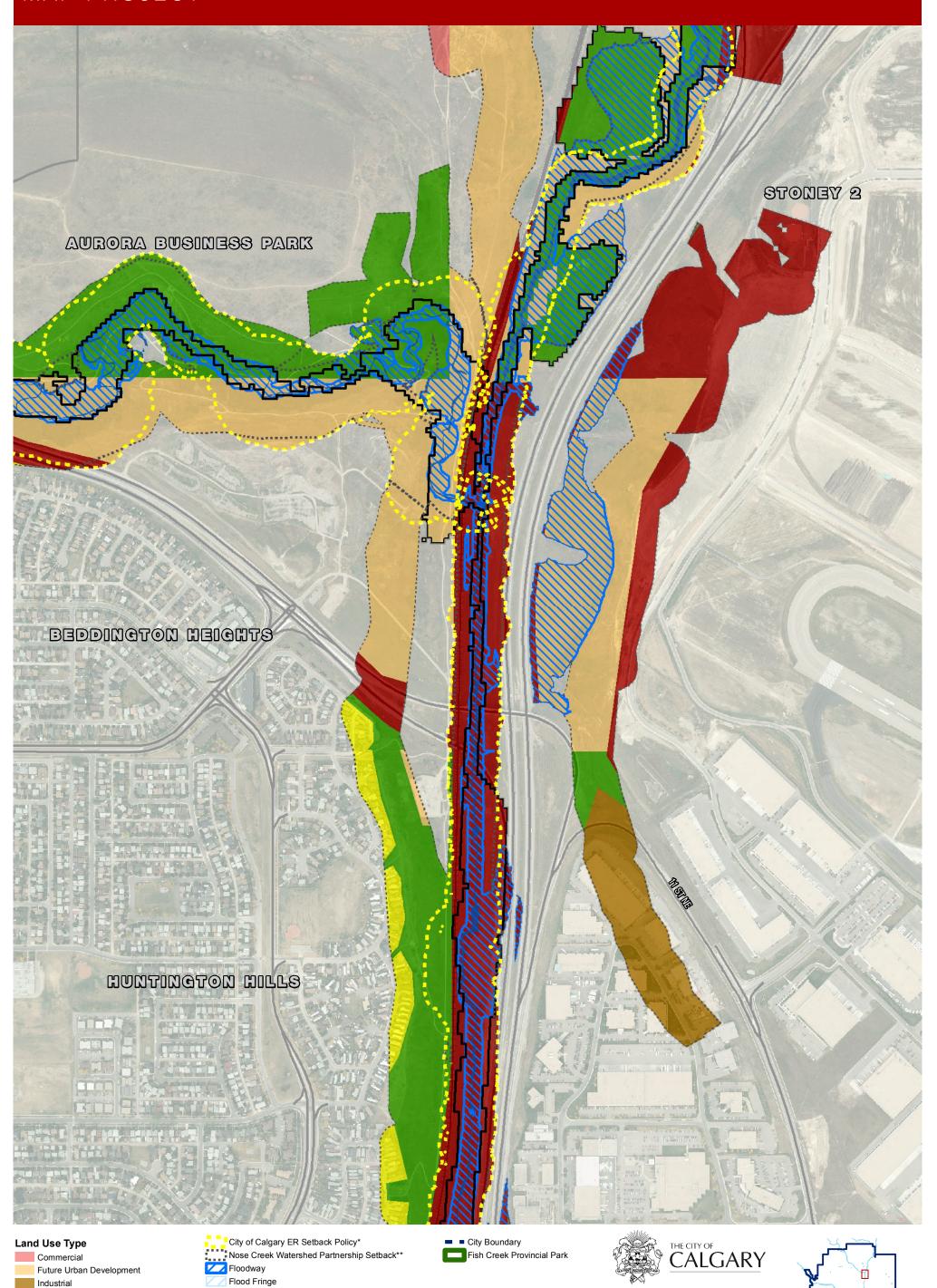




200 Metres 300

400





Flood Extent - 100 Year (Nose Creek/West Nose Creek)

\*Note that ER setbacks for lower order streams are not mapped as they were out of the project scope

\*\*Recommended setback boundary of Nose Creek Watershed Partnership including floodplain, meander belt width and adjacent escarpments >15%

0 50 100

200

Metres

300

400

Outer Riparian Zone Boundary

Streams

HH Rail

Major Roads

Institutional

Mixed Use

Residential

Golf Course

Major Infrastructure

Parks, Recreation and Public Education



Stormwater Lift Station

Storm Main (>900mm diameter) Sanitary Main (>600mm diameter)

Water Main (>400mm diameter)

- - Siphon

— Pipeline River Crossing Locations Mater / Waste Water Treament Plants

Existing Storm Retrofit Pond Possible Location of Storm Retrofit Pond

■ Bank Erosion Hotspot

Existing Bank Infrastructure (e.g., Rip Rap, Retaining Walls, Weirs)

Paved Trails

**Gravel Trails** 

= Bridge Buildings

Parks (Maintained Turf Areas)

City Boundary

Major Roads

⊢ Rail

Streams

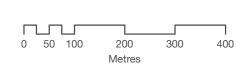
Fish Creek Provincial Park

(i) outer riparian zone of the variable width model, (ii) City ER setback policy boundary, (iii) Nose Creek Watershed Partnership recommended setback policy

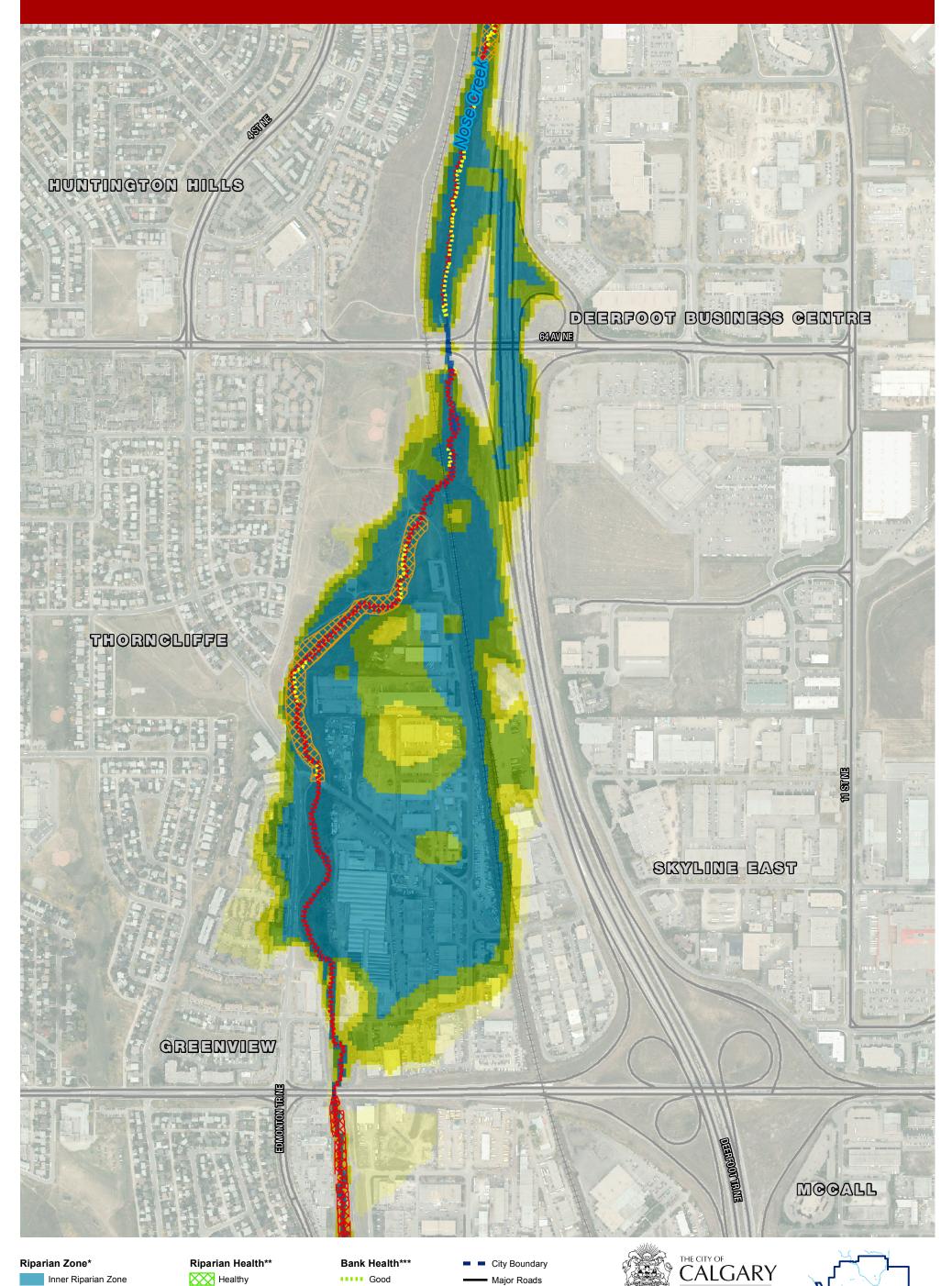
(See Theme 2-Land and Regulatory Issues)











<del>⊢</del> Rail

Streams

Fish Creek Provincial Park

0 50 100

300

200 Metres 400

Moderate

\*\*\*Based on field studies of major rivers / creeks, excluding private residential riverfront lots or steep valley slopes with limited riparian habitat

Poor

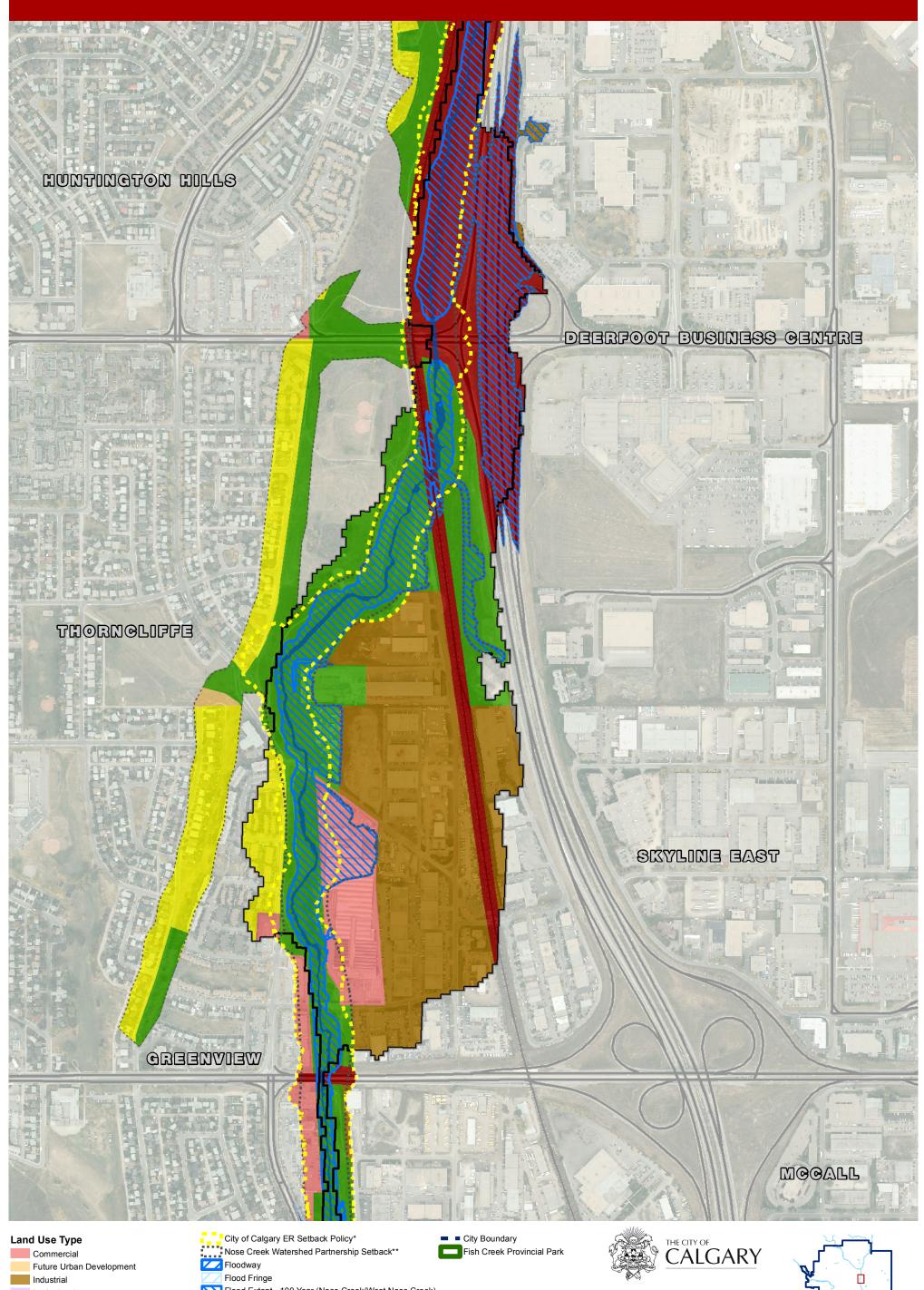
Middle Riparian Zone

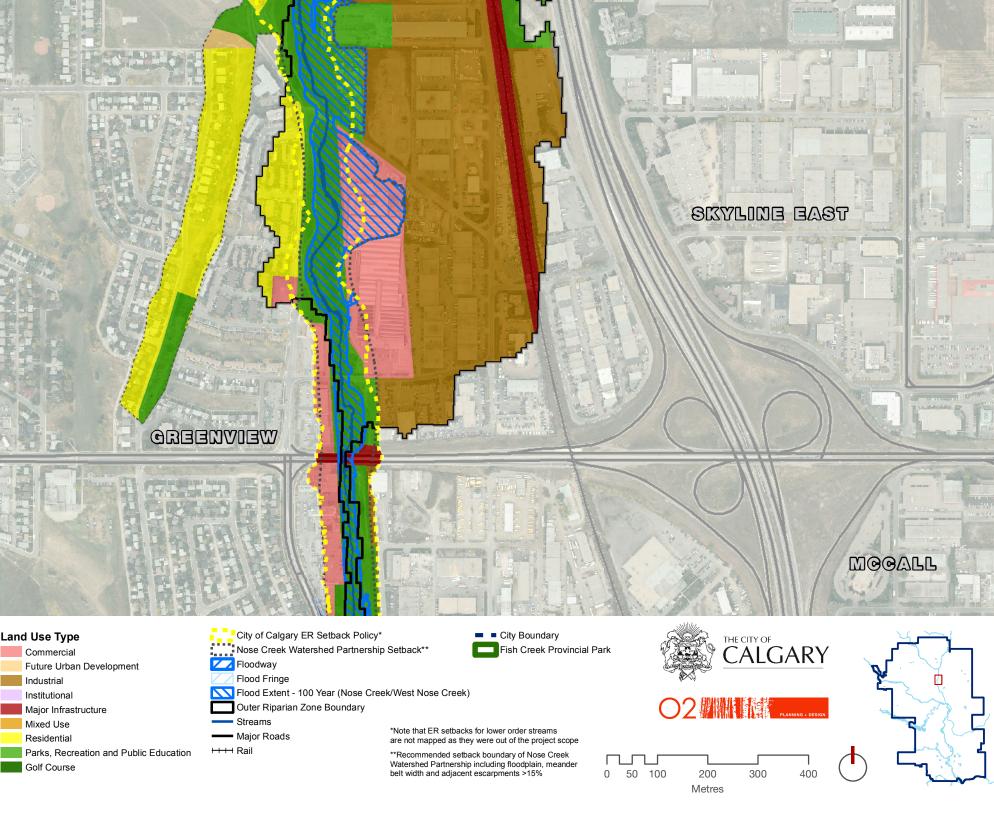
Outer Riparian Zone

Potential Outermost Riparian Zone

Unhealthy

Healthy, but with Problems







(See Theme 2-Land and Regulatory Issues)

0 50 100

200

Metres

300

400

Existing Storm Pond
Existing Bank Infrastructure (e.g., Rip Rap, Retaining Walls, Weirs)

Parks (Maintained Turf Areas)

Fish Creek Provincial Park

City Boundary

Major Roads

Streams

⊢ Rail

■ Bank Erosion Hotspot

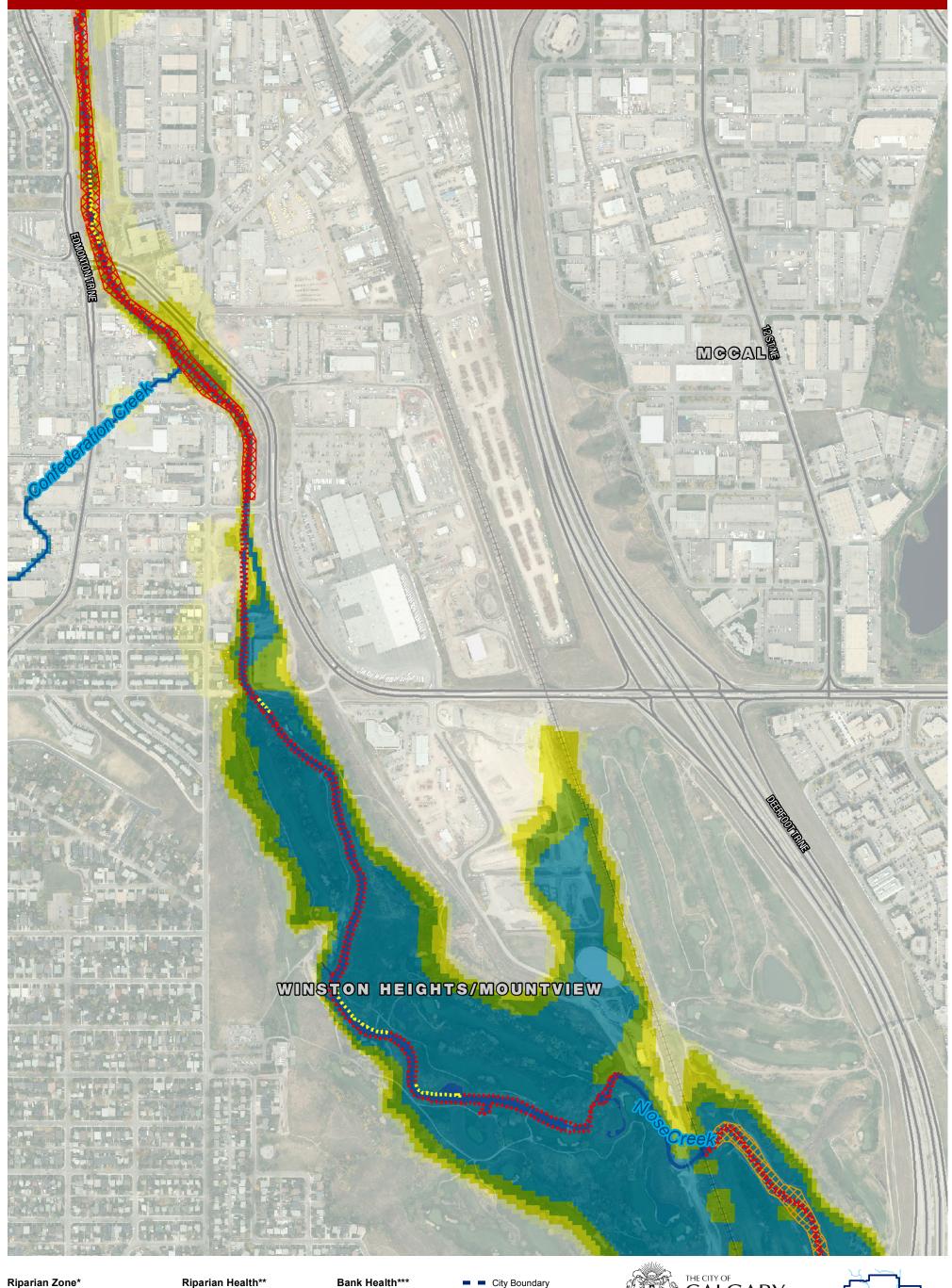
Pipeline River Crossing Locations

Water / Waste Water Treament Plants

Possible Location of Storm Retrofit Pond

Existing Storm Retrofit Pond

- - Siphon



Inner Riparian Zone

Middle Riparian Zone

Outer Riparian Zone

Potential Outermost Riparian Zone

Healthy, but with Problems

Healthy

Unhealthy

Good

Moderate Poor

\*\*\*Based on field studies of major rivers / creeks, excluding private residential riverfront lots or steep valley slopes with limited riparian habitat

City Boundary Major Roads

++++ Rail

Streams Fish Creek Provincial Park

0 50 100



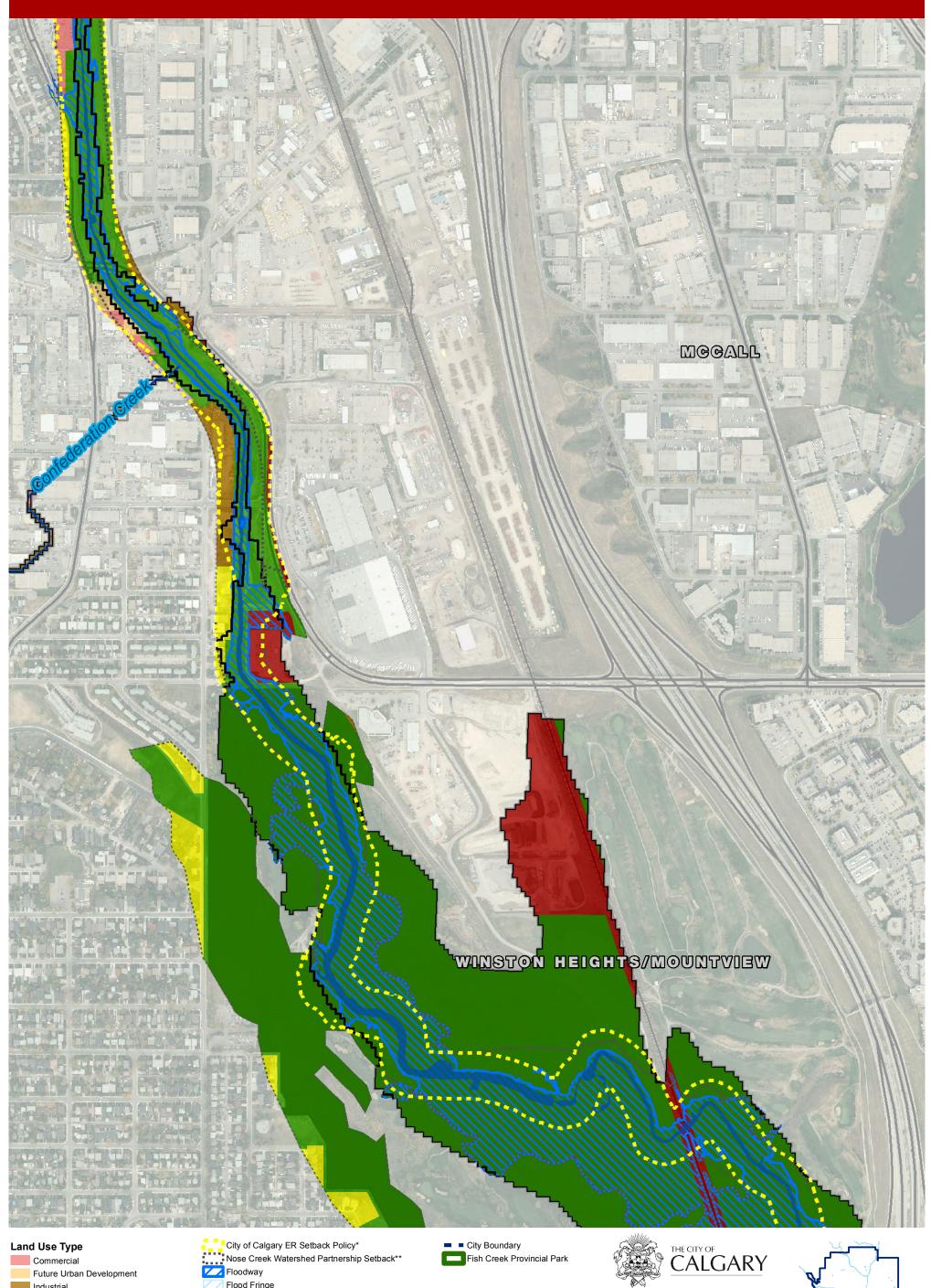


300

200

Metres





Industrial Flood Fringe Flood Extent - 100 Year (Nose Creek/West Nose Creek) Institutional Outer Riparian Zone Boundary Major Infrastructure Streams Mixed Use \*Note that ER setbacks for lower order streams are not mapped as they were out of the project scope Major Roads Residential HH Rail Parks, Recreation and Public Education \*\*Recommended setback boundary of Nose Creek Watershed Partnership including floodplain, meander belt width and adjacent escarpments >15% Golf Course 0 50 100 200 300 400 Metres



(See Theme 2-Land and Regulatory Issues)

0 50 100

200

Metres

300

400

Existing Bank Infrastructure (e.g., Rip Rap, Retaining Walls, Weirs)

Bank Erosion Hotspot

Existing Storm Retrofit Pond

Pipeline River Crossing Locations

Water / Waste Water Treament Plants

Possible Location of Storm Retrofit Pond

- - Siphon

Parks (Maintained Turf Areas)

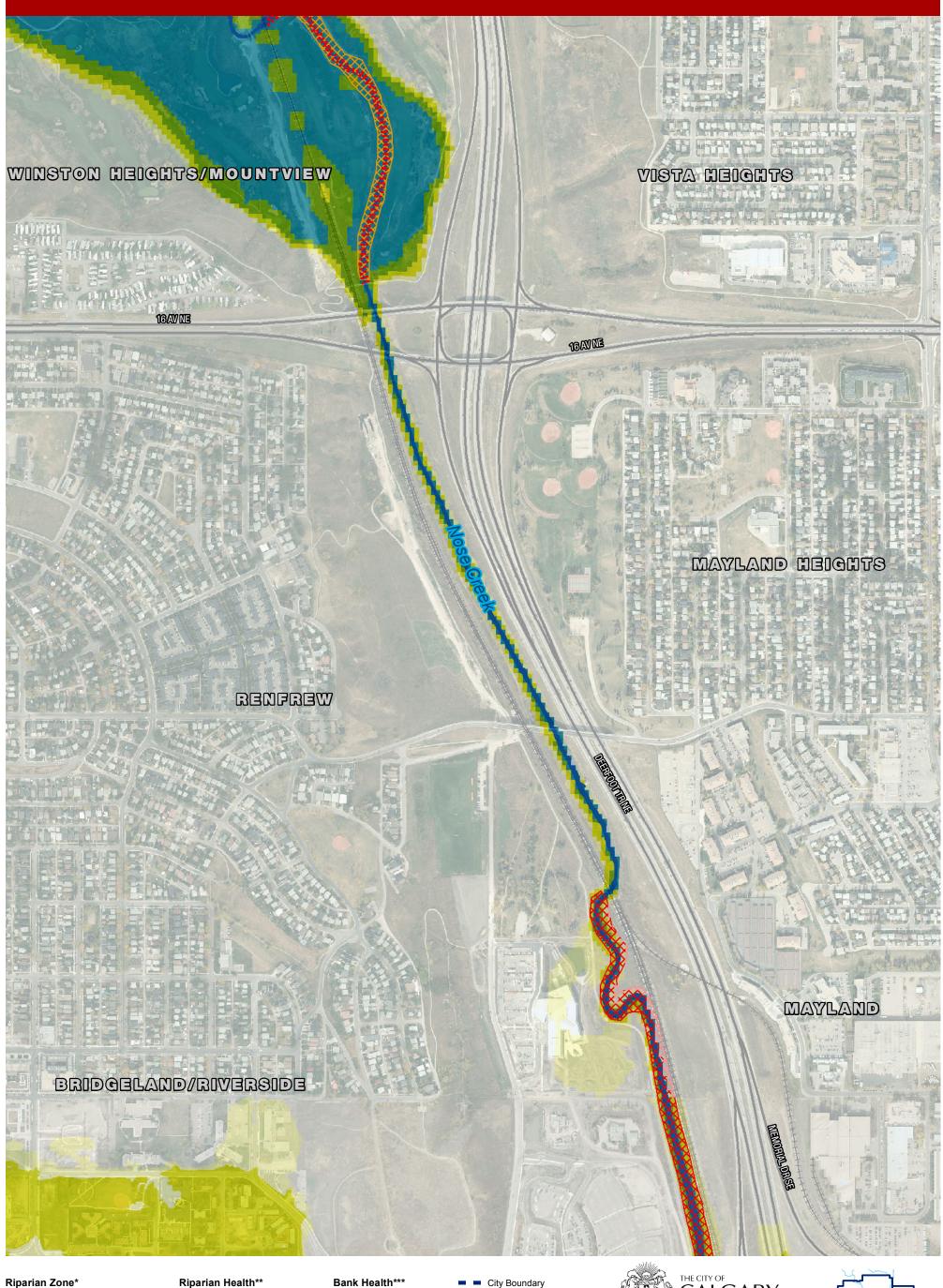
Fish Creek Provincial Park

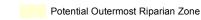
City Boundary

Major Roads

Streams

⊢ Rail





Inner Riparian Zone

Middle Riparian Zone

Outer Riparian Zone

\*Variable Width Riparian Model Outputs

\*\*Based on field studies of sampled riparian polygons only

### Riparian Health\*\*

Healthy Good

Healthy, but with Problems Unhealthy

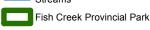
> \*\*\*Based on field studies of major rivers / creeks, excluding private residential riverfront lots or steep valley slopes with limited riparian habitat

Moderate

Poor

### City Boundary Major Roads

<del>⊢</del> Rail Streams







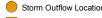


Metres

### RIPARIAN AREAS MAP PROJECT

### EXISTING INFRASTRUCTURE AND POSSIBLE IMPROVEMENTS NOSE CREEK 07





Storm Main (>900mm diameter)

Sanitary Main (>600mm diameter)

Water Main (>400mm diameter) - - Siphon

— Pipeline River Crossing Locations

Existing Storm Retrofit Pond Possible Location of Storm Retrofit Pond

■ Bank Erosion Hotspot

Mater / Waste Water Treament Plants

Existing Bank Infrastructure (e.g., Rip Rap, Retaining Walls, Weirs)

Buildings

= Bridge

Parks (Maintained Turf Areas)

City Boundary ■ Major Roads

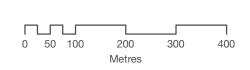
<del>-----</del> Rail

Streams Fish Creek Provincial Park (iii) City ER setback policy boundary, (iii) Nose Creek Watershed Partnership recommended setback policy

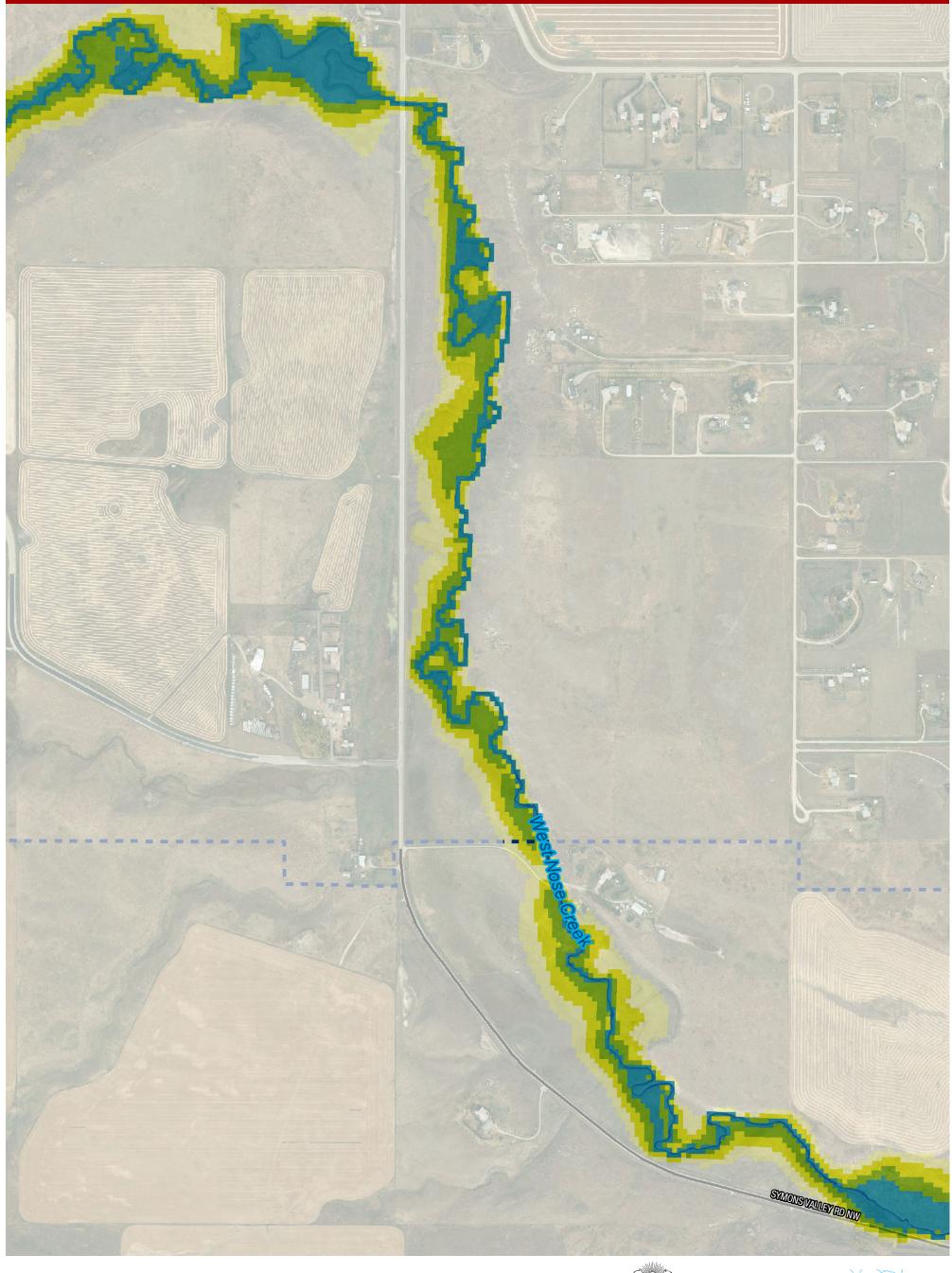
(See Theme 2-Land and Regulatory Issues)











Inner Riparian Zone

Middle Riparian Zone

Outer Riparian Zone

Potential Outermost Riparian Zone

Riparian Zone\*

Bank Health\*\*\* Good Healthy

Healthy, but with Problems Moderate Poor Unhealthy

\*\*\*Based on field studies of major rivers / creeks, excluding private residential riverfront lots or steep valley slopes with limited riparian habitat

City Boundary Major Roads

<del>⊢++-</del> Rail

Streams Fish Creek Provincial Park

0 50 100



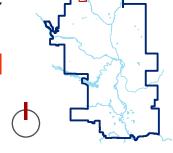


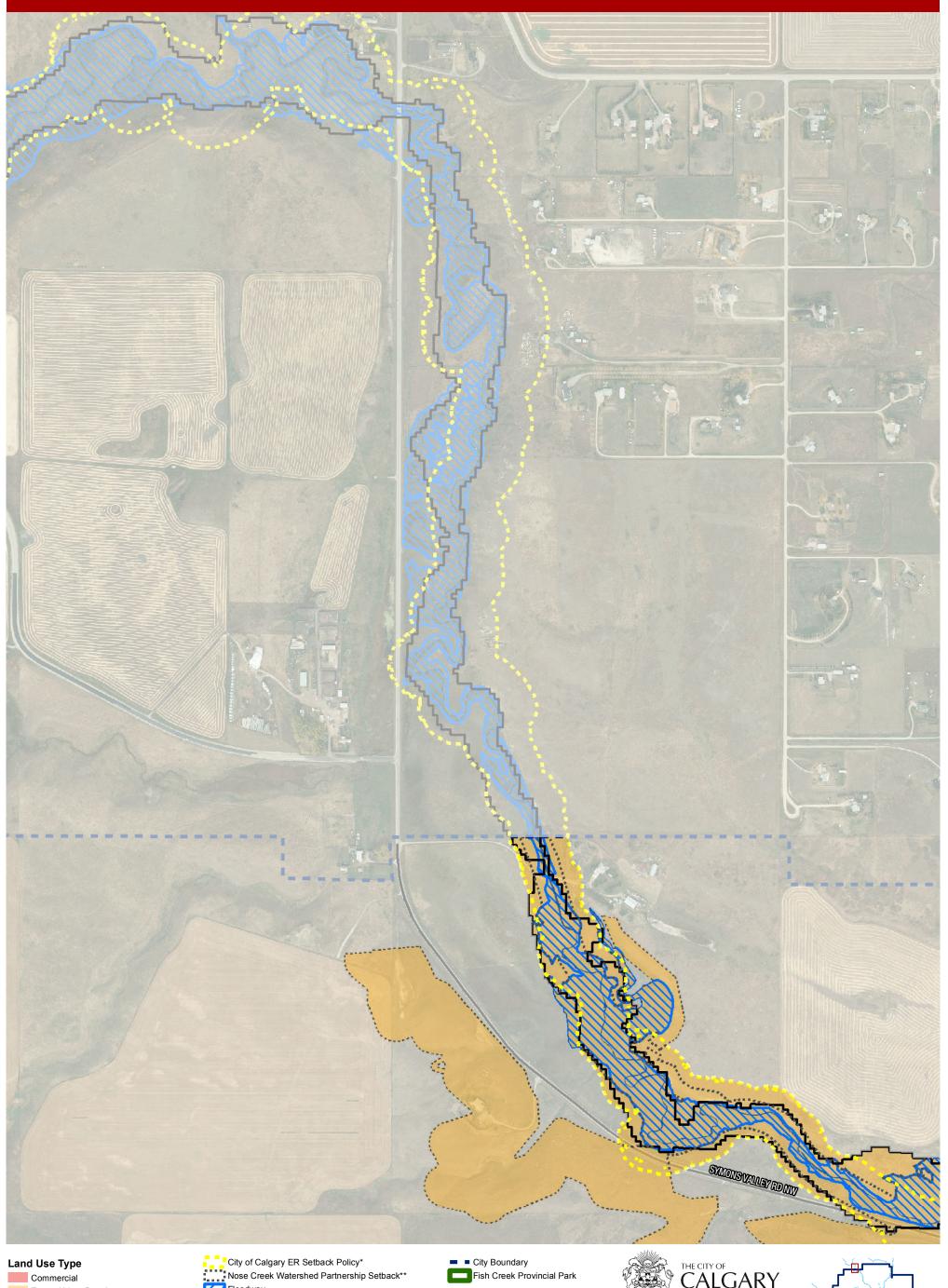
300

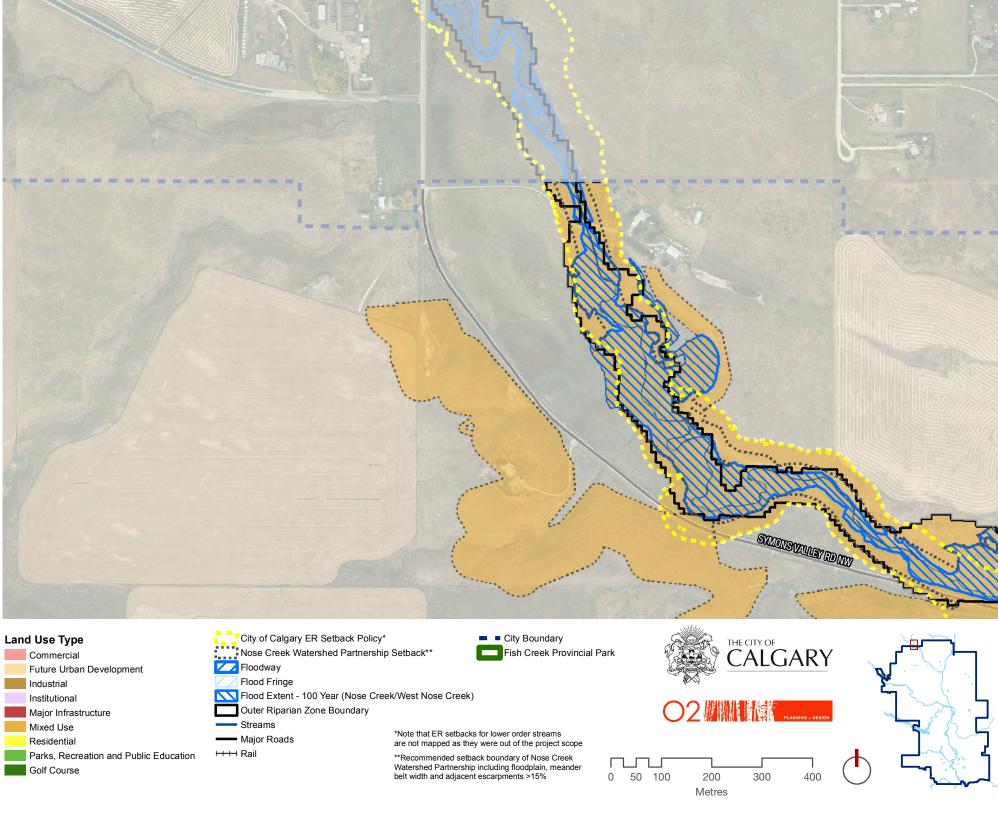
400

200

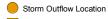
Metres











Stormwater Lift Station

Storm Main (>900mm diameter) Sanitary Main (>600mm diameter)

Water Main (>400mm diameter)

- - Siphon

Pipeline River Crossing Locations Mater / Waste Water Treament Plants

Existing Storm Retrofit Pond

■ Bank Erosion Hotspot

Possible Location of Storm Retrofit Pond

Existing Bank Infrastructure (e.g., Rip Rap, Retaining Walls, Weirs)

Candidate Flood / Erosion Control Projects

Paved Trails **Gravel Trails** 

= Bridge Buildings

Parks (Maintained Turf Areas)

City Boundary

Major Roads

HH Rail

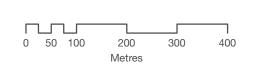
Streams Fish Creek Provincial Park The non-masked area is based on the greater of:

(i) outer riparian zone of the variable width model, (ii) City ER setback policy boundary, (iii) Nose Creek Watershed Partnership recommended setback policy

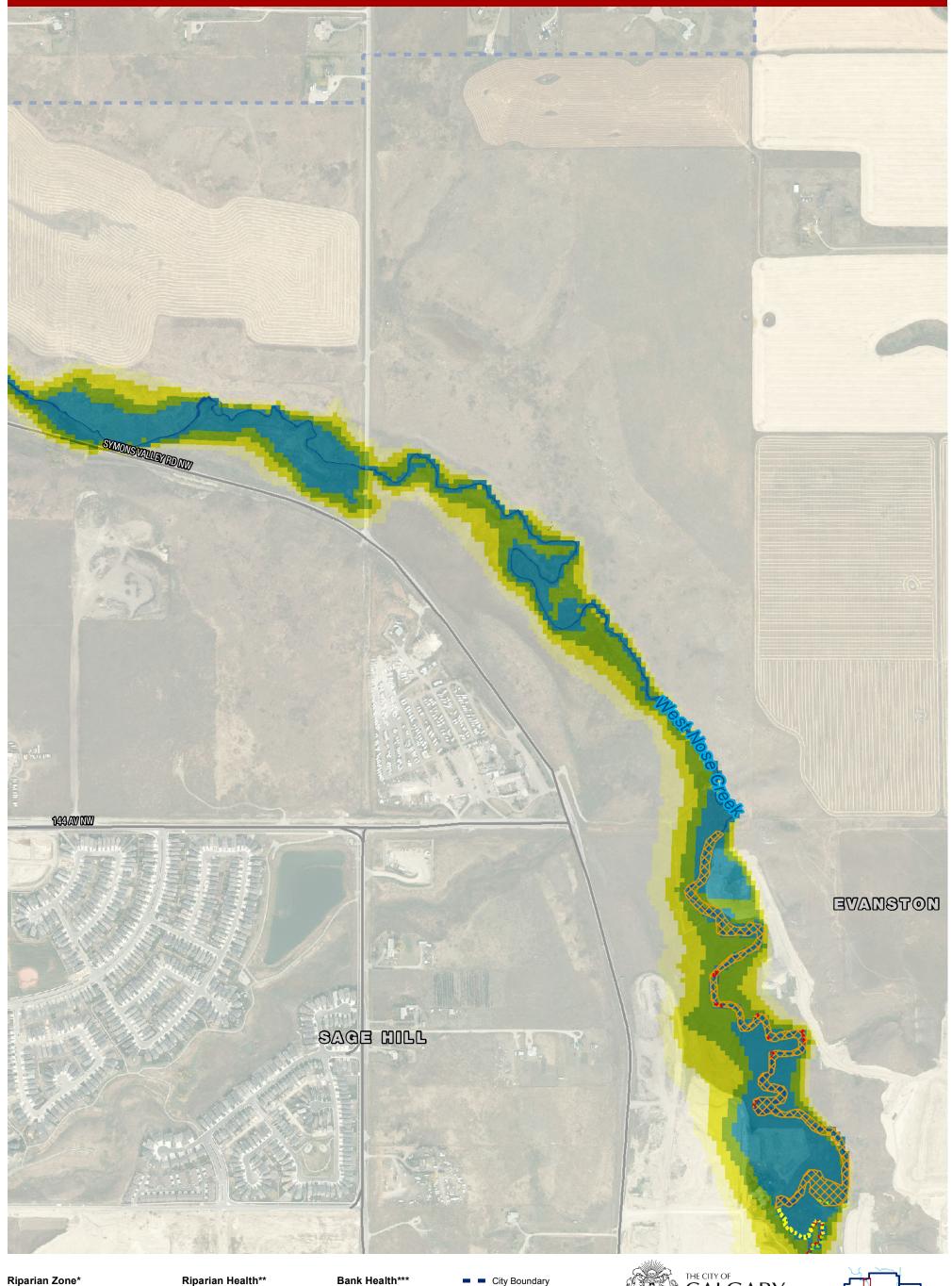
(See Theme 2-Land and Regulatory Issues)











Inner Riparian Zone

Middle Riparian Zone

Outer Riparian Zone

Potential Outermost Riparian Zone

Healthy Good

Healthy, but with Problems Unhealthy

\*\*\*Based on field studies of major rivers / creeks, excluding private residential riverfront lots or steep valley slopes with limited riparian habitat

Moderate

Poor

City Boundary Major Roads

++++ Rail

Streams Fish Creek Provincial Park

0 50 100



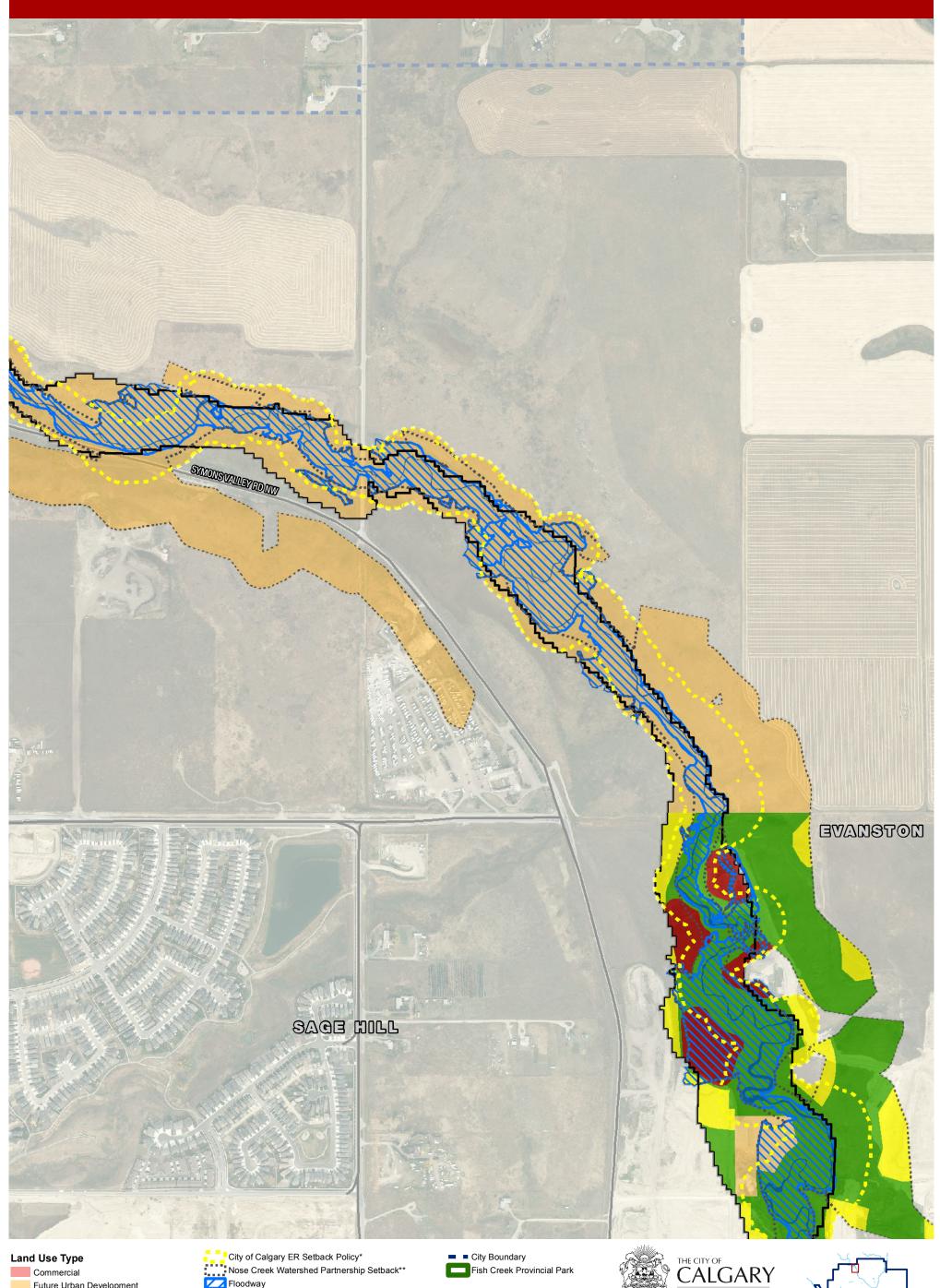


300

200

Metres

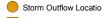




#### Nose Creek Watershed Partnership Setback\*\* Floodway Future Urban Development Flood Fringe Industrial Flood Extent - 100 Year (Nose Creek/West Nose Creek) Institutional Outer Riparian Zone Boundary Major Infrastructure Streams Mixed Use \*Note that ER setbacks for lower order streams are not mapped as they were out of the project scope Major Roads Residential HH Rail Parks, Recreation and Public Education \*\*Recommended setback boundary of Nose Creek Watershed Partnership including floodplain, meander belt width and adjacent escarpments >15% Golf Course 0 50 100 200 300 400 Metres

### EXISTING INFRASTRUCTURE AND POSSIBLE IMPROVEMENTS WEST NOSE CREEK 02





Storm Main (>900mm diameter)

Sanitary Main (>600mm diameter)

Water Main (>400mm diameter) - - Siphon

Pipeline River Crossing Locations Mater / Waste Water Treament Plants

Existing Storm Retrofit Pond Possible Location of Storm Retrofit Pond

■ Bank Erosion Hotspot

Existing Bank Infrastructure (e.g., Rip Rap, Retaining Walls, Weirs)

Existing Storm Pond

**Gravel Trails** = Bridge

Buildings Parks (Maintained Turf Areas)

City Boundary

Major Roads

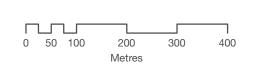
HH Rail

Streams Fish Creek Provincial Park (i) outer riparian zone of the variable width model, (ii) City ER setback policy boundary, (iii) Nose Creek Watershed Partnership recommended setback policy

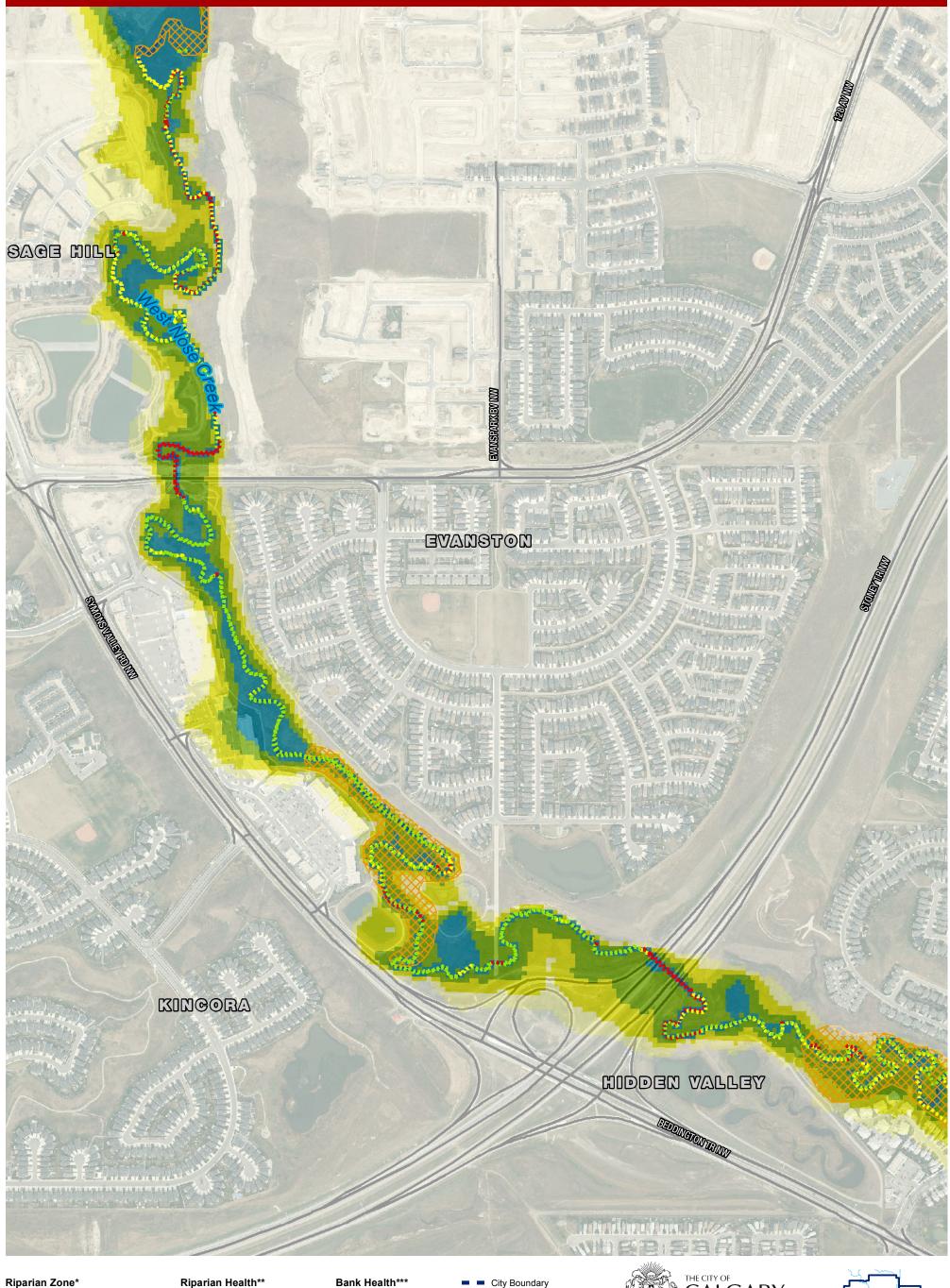
(See Theme 2-Land and Regulatory Issues)











Inner Riparian Zone

Middle Riparian Zone

Outer Riparian Zone

Potential Outermost Riparian Zone

Bank Health\*\*\* Healthy Good

Healthy, but with Problems Unhealthy

> \*\*\*Based on field studies of major rivers / creeks, excluding private residential riverfront lots or steep valley slopes with limited riparian habitat

Moderate Poor

City Boundary Major Roads

<del>⊢</del> Rail

Streams Fish Creek Provincial Park

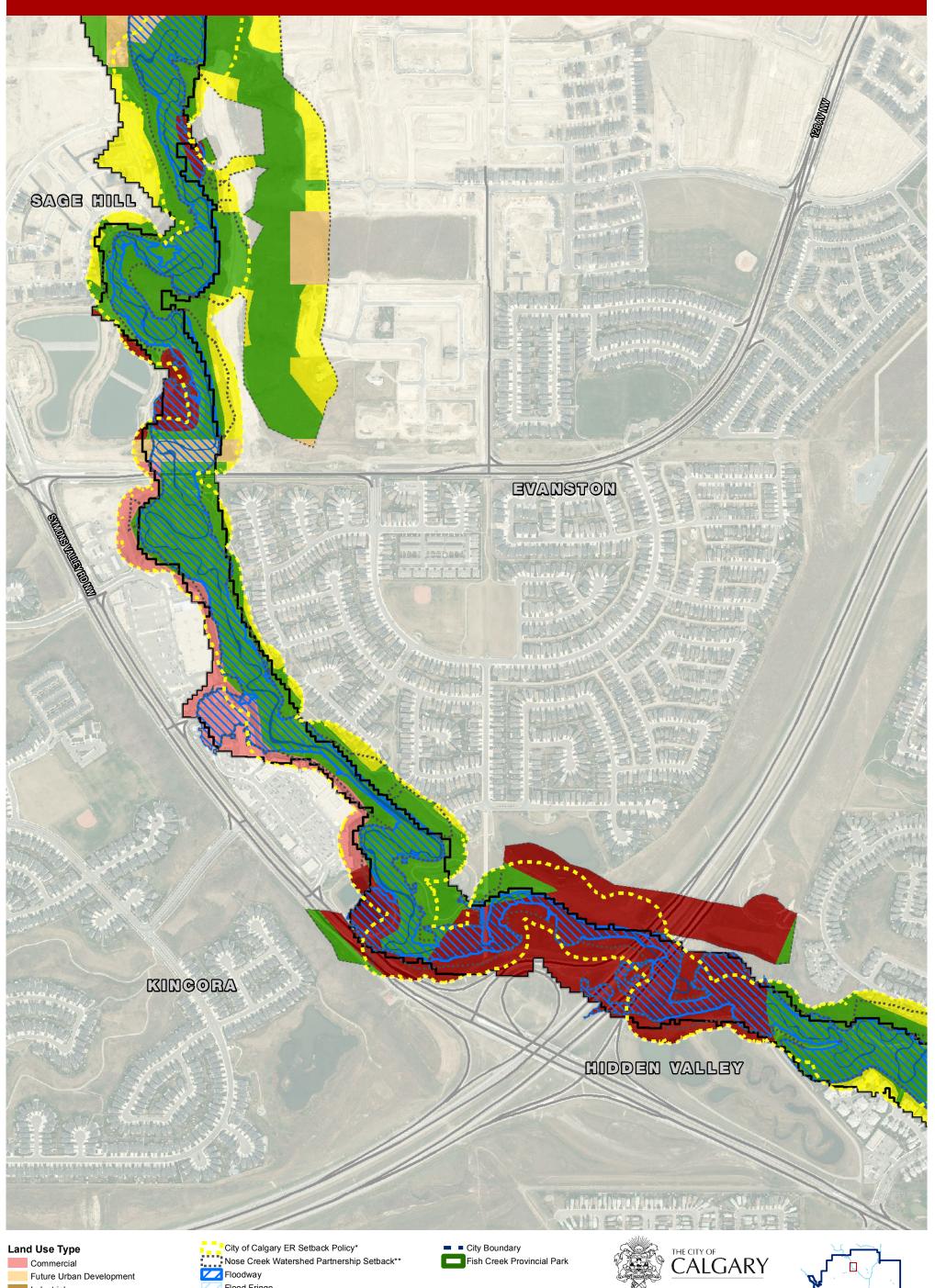
> 0 50 100



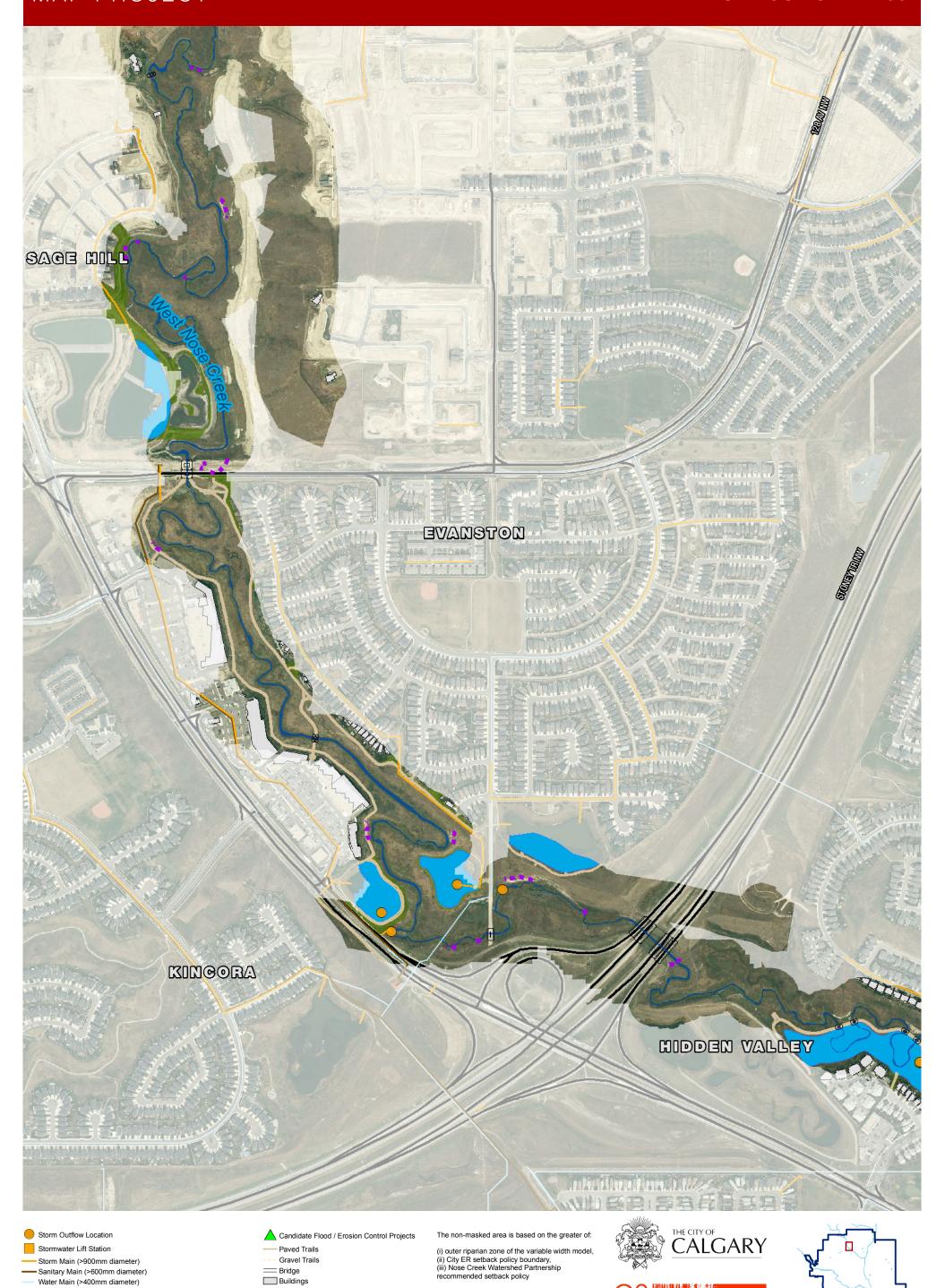


200 Metres 300





Flood Fringe Industrial Flood Extent - 100 Year (Nose Creek/West Nose Creek) Institutional Outer Riparian Zone Boundary Major Infrastructure Streams Mixed Use \*Note that ER setbacks for lower order streams are not mapped as they were out of the project scope Major Roads Residential HH Rail Parks, Recreation and Public Education \*\*Recommended setback boundary of Nose Creek Watershed Partnership including floodplain, meander belt width and adjacent escarpments >15% Golf Course 0 50 100 200 300 400 Metres



(See Theme 2-Land and Regulatory Issues)

0 50 100

200

Metres

300

400

Existing Storm Pond
Existing Bank Infrastructure (e.g., Rip Rap, Retaining Walls, Weirs)
Bank Erosion Hotspot

- - Siphon

— Pipeline River Crossing Locations

Existing Storm Retrofit Pond

Mater / Waste Water Treament Plants

Possible Location of Storm Retrofit Pond

Parks (Maintained Turf Areas)

Fish Creek Provincial Park

City Boundary

Streams

⊢ Rail

■ Major Roads



Middle Riparian Zone

Outer Riparian Zone

Potential Outermost Riparian Zone

Unhealthy

Healthy, but with Problems

Moderate

\*\*\*Based on field studies of major rivers / creeks, excluding private residential riverfront lots or steep valley slopes with limited riparian habitat

Poor

<del>⊢</del> Rail

Streams

Fish Creek Provincial Park

0 50 100

200

Metres

300

400

HH Rail

Parks, Recreation and Public Education

Golf Course



\*\*Recommended setback boundary of Nose Creek Watershed Partnership including floodplain, meander belt width and adjacent escarpments >15%

0 50 100

200

Metres

300

400



Existing Bank Infrastructure (e.g., Rip Rap, Retaining Walls, Weirs)

■ Bank Erosion Hotspot

Existing Storm Retrofit Pond

- - Siphon

Sanitary Main (>600mm diameter)

Water Main (>400mm diameter)

Mater / Waste Water Treament Plants

Possible Location of Storm Retrofit Pond

— Pipeline River Crossing Locations

Streams Fish Creek Provincial Park

Parks (Maintained Turf Areas)

= Bridge Buildings

<del>-----</del> Rail

City Boundary

■ Major Roads

(ii) City ER setback policy boundary, (iii) Nose Creek Watershed Partnership recommended setback policy

(See Theme 2-Land and Regulatory Issues)



0 50 100 300 400 200 Metres



Middle Riparian Zone

Outer Riparian Zone

Potential Outermost Riparian Zone

Healthy

Healthy, but with Problems Unhealthy

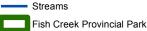
> \*\*\*Based on field studies of major rivers / creeks, excluding private residential riverfront lots or steep valley slopes with limited riparian habitat

Moderate

Poor

Major Roads

<del>⊢</del> Rail



0 50 100



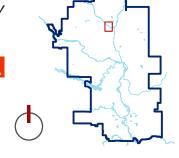


300

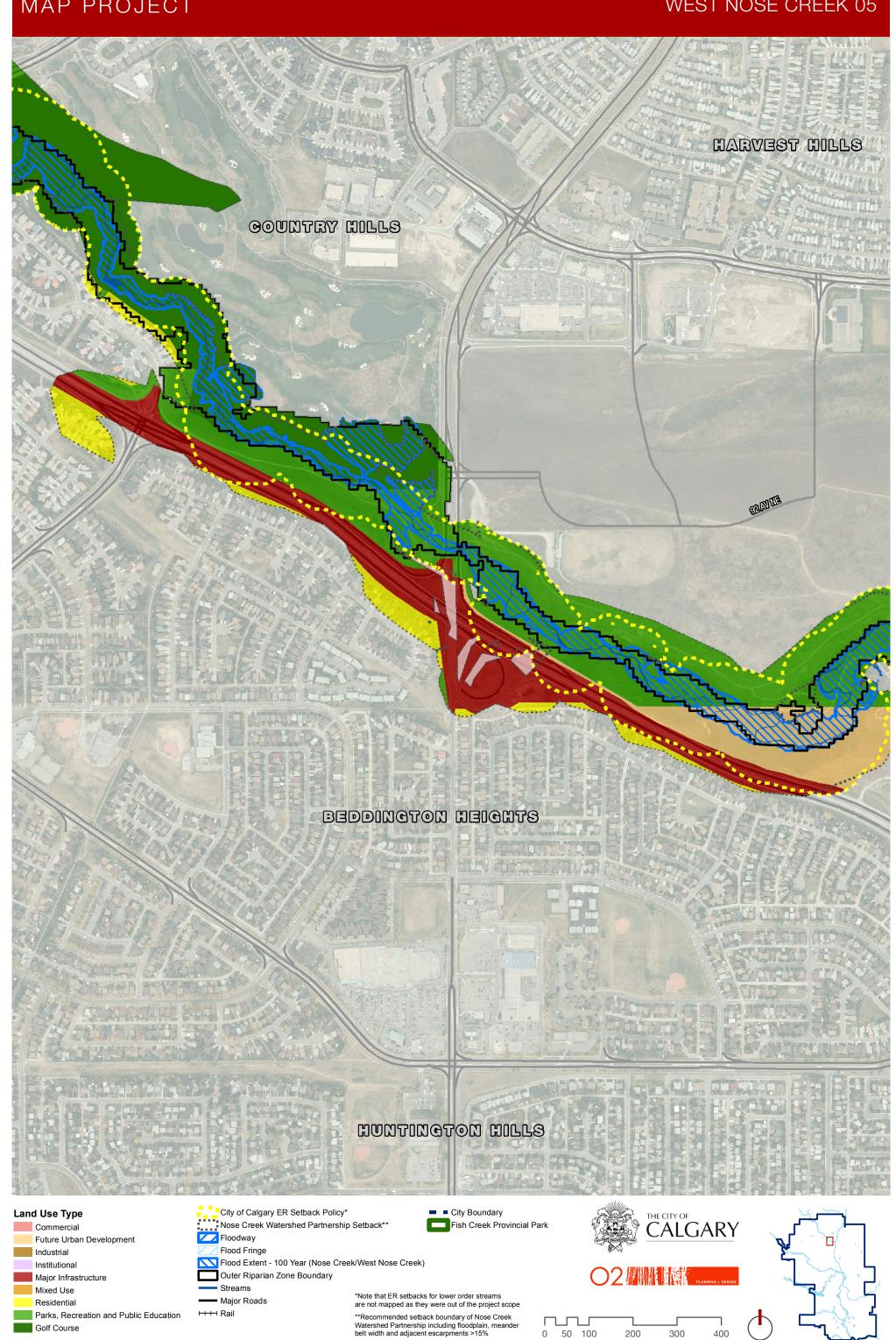
400

200

Metres



Golf Course



0 50 100

200

Metres

300

400



0 50 100

300

200

Metres

400

Existing Bank Infrastructure (e.g., Rip Rap, Retaining Walls, Weirs)
■ Bank Erosion Hotspot

Existing Storm Retrofit Pond

Existing Storm Pond

Pipeline River Crossing Locations

Mater / Waste Water Treament Plants

Possible Location of Storm Retrofit Pond

City Boundary

Streams

⊢ Rail

■ Major Roads

Fish Creek Provincial Park