

6.3.4 Model Results - Relaxed Standard

The performance issues identified in the simulation results based on the relaxed servicing standard as defined in **Table 6-2** in the growth scenarios under different demand conditions are identified in **Table 6-7**. The hydraulic performance of the six growth scenarios were simulated with the relaxed servicing standard in WaterCAD and the results are presented in **Figure 6-26** to **Figure 6-49** following the table.

These results indicated that if the servicing standard is relaxed to the levels indicated in **Table 6-2**, the hydraulic performance in all the six growth scenarios are better than the ones with the current standard. The modeled fire flows are at the desired levels except in Growth Scenario 5 Area I. The available fire flow in the west portion of Area I in Growth Scenario 5 are lower than 233 L/s due to unlooped watermains. The developers can consider install a watermain parallel to 79 Street to form a loop or have the building designed based on the available fire flow in the Area I west portion.

The residual pressure in the night filling period in Growth Scenarios 1 and 5 can drop below 250 kPa in the Edgar, Glendale and Johnstone Park areas. The simulated residual pressures in MDD and PHD for all the growth scenarios are higher than 250 kPa which is the relaxed standard. However, these low residual pressures might trigger user complaints. The City can install some pressure loggers to monitor the pressures in these areas. The City might consider having the building owners install inhouse booster pumps in some buildings that requires higher pressure.

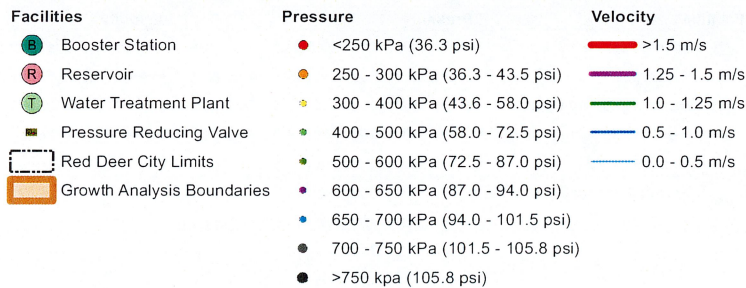
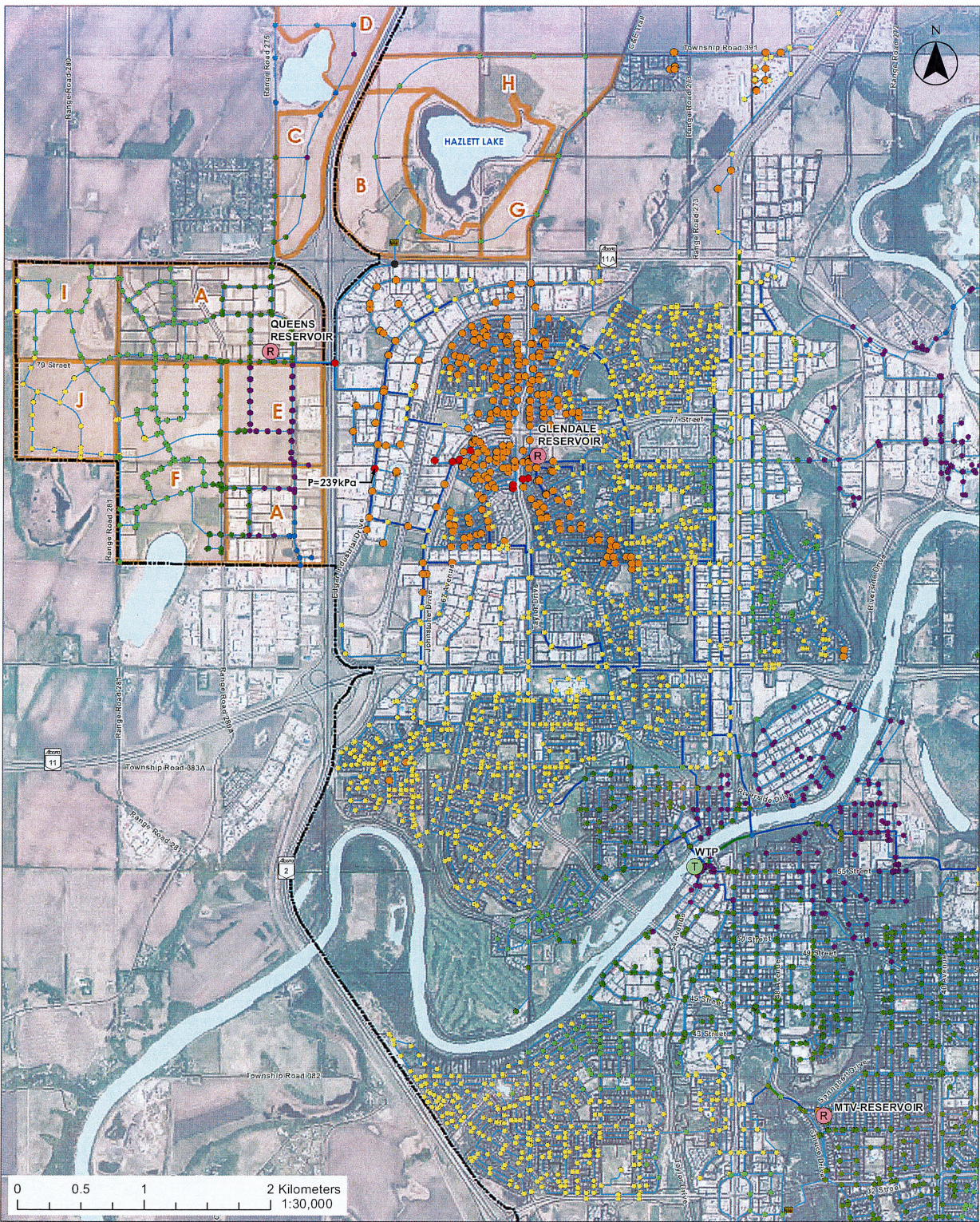
Based on hydraulic modeling, the Queens Business Park pump station requires the two existing 150 HP pumps to be turned on to deliver the desired fire flows in all the growth scenarios. The City should have the third 150 HP installed in the Queens pump station as a backup pump.



Table 6-7:Hydraulic Performance Issues Under Relaxed Standard

Growth Scenario	AFF In MDD	MDD (Filling to Queens to meet the growth area MDD)	Night Fill (12AM-6AM)	PHD	Pump Operation
1	Figure 6-26 No issues; AFF above 233 L/s	Figure 6-27 No issues (min. pressure are higher than 250 kPa)	Figure 6-28 Johnstone Park, Glendale and Edgar have less than 250 kPa pressure nodes	Figure 6-29 No issues	Queens Pump Station needs to run 2x150HP and 1X100 HP pumps, need a new 150 HP pump for backup Other pump stations are operating within firm capacity
2	Figure 6-30 No issues; AFF above 233 L/s	Figure 6-31 No issues	Figure 6-32 No issues	Figure 6-33 No issues	Queens Pump Station needs to run 2x150HP and 1X100 HP pumps, need a new 150 HP pump for backup Other pump stations are operating within firm capacity
3	Figure 6-34 No issues; AFF above 233 L/s	Figure 6-35 No issues	Figure 6-36 One node in Edgar has residual pressure at 250 kPa	Figure 6-37 No issues	Queens Pump Station needs to run 2x150HP and 1X100 HP pumps, need a new 150 HP pump for backup Other pump stations are operating within firm capacity
4	Figure 6-38 No issues; AFF above 233 L/s	Figure 6-39 No issues	Figure 6-40 No issues	Figure 6-41 No issues	Queens Pump Station needs to run 2x150HP and 1X100 HP pumps, need a new 150 HP pump for backup Other pump stations are operating within firm capacity
5	Figure 6-42 Lower than 233 L/s fire flows in Area I due to unlooped network	Figure 6-43 No issues	Figure 6-44 No issues	Figure 6-45 No issues	Queens Pump Station needs to run 2x150HP and 1X100 HP pumps, need a new 150 HP pump for backup Other pump stations are operating within firm capacity
6	Figure 6-46 No issues; AFF above 233 L/s	Figure 6-47 No issues	Figure 6-48 No issues	Figure 6-49 No issues	Queens Pump Station needs to run 2x150HP and 1X100 HP pumps, need a new 150 HP pump for backup Other pump stations are operating within firm capacity





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Figure 6.28: Scenario 1
Pressures and Pipe Velocities in the Night Filling - Relaxed Standard
City of Red Deer Water Model Update
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