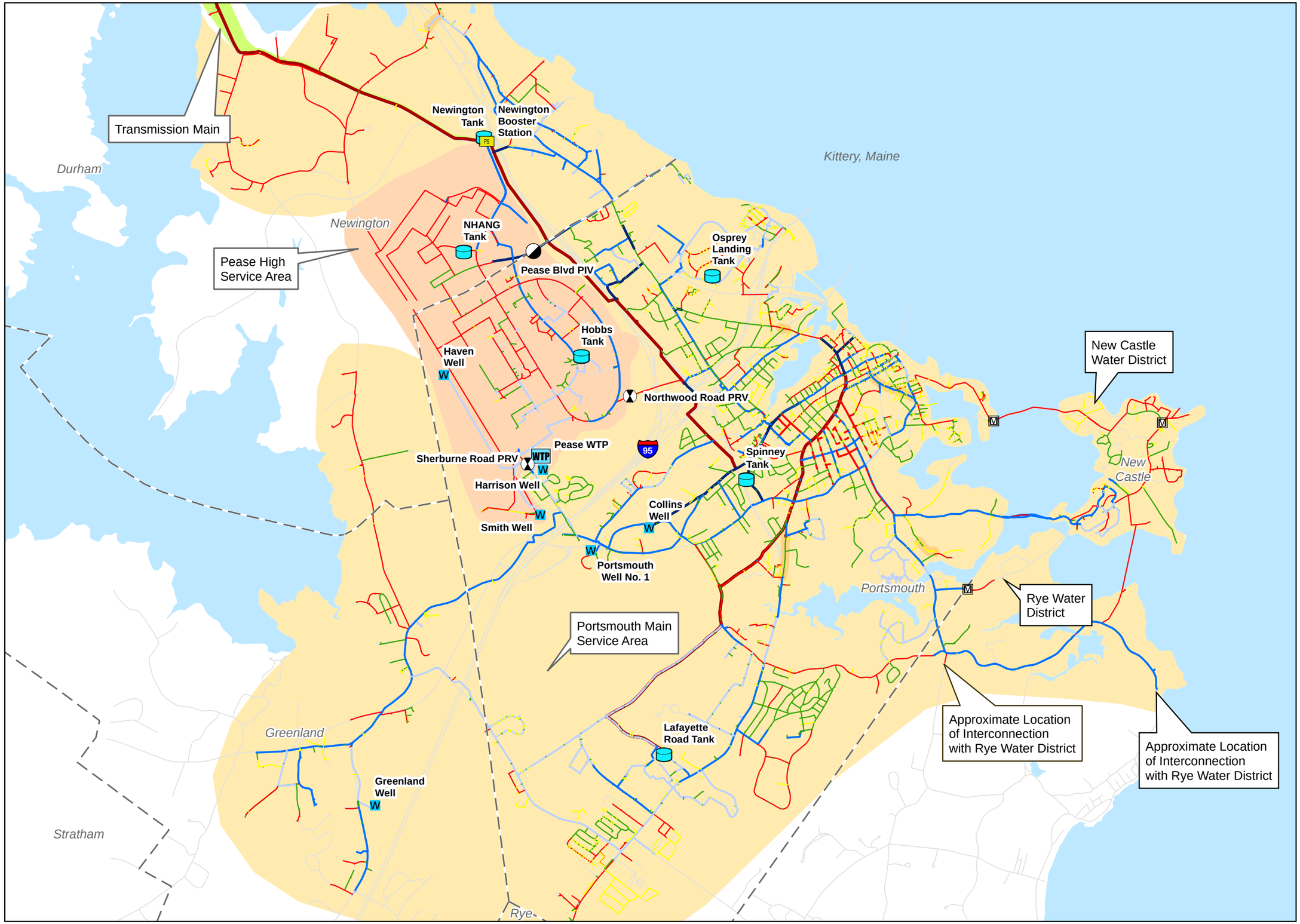
FIGURE ES-1



LEGEND

- Meter Pits
- PRV
- PIV
- Pump Station
- Well
- Tank
- Water Treatment Plant
- Town Line

Progress

- 12" DI, Installed
- 12" DI, Proposed for 2013
- 16" DI, Installed
- 8" DI, Installed
- 8" DI, Proposed for 2013

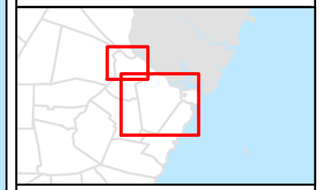
Water Main

- <6"
- 6"
- 8"
- 10"
- 12"
- 14"
- 16"

Transmission Main

- 20-24"
- Future Work
- Major Roads

LOCUS MAP



0 1,750 3,500
Feet

1:42,000

NOTES

Data sources:

New Hampshire Geographically Referenced Analysis and Information Transfer System (GRANIT)

City of Portsmouth, New Hampshire

Portsmouth Water System
Portsmouth, New Hampshire

FEBRUARY 2013

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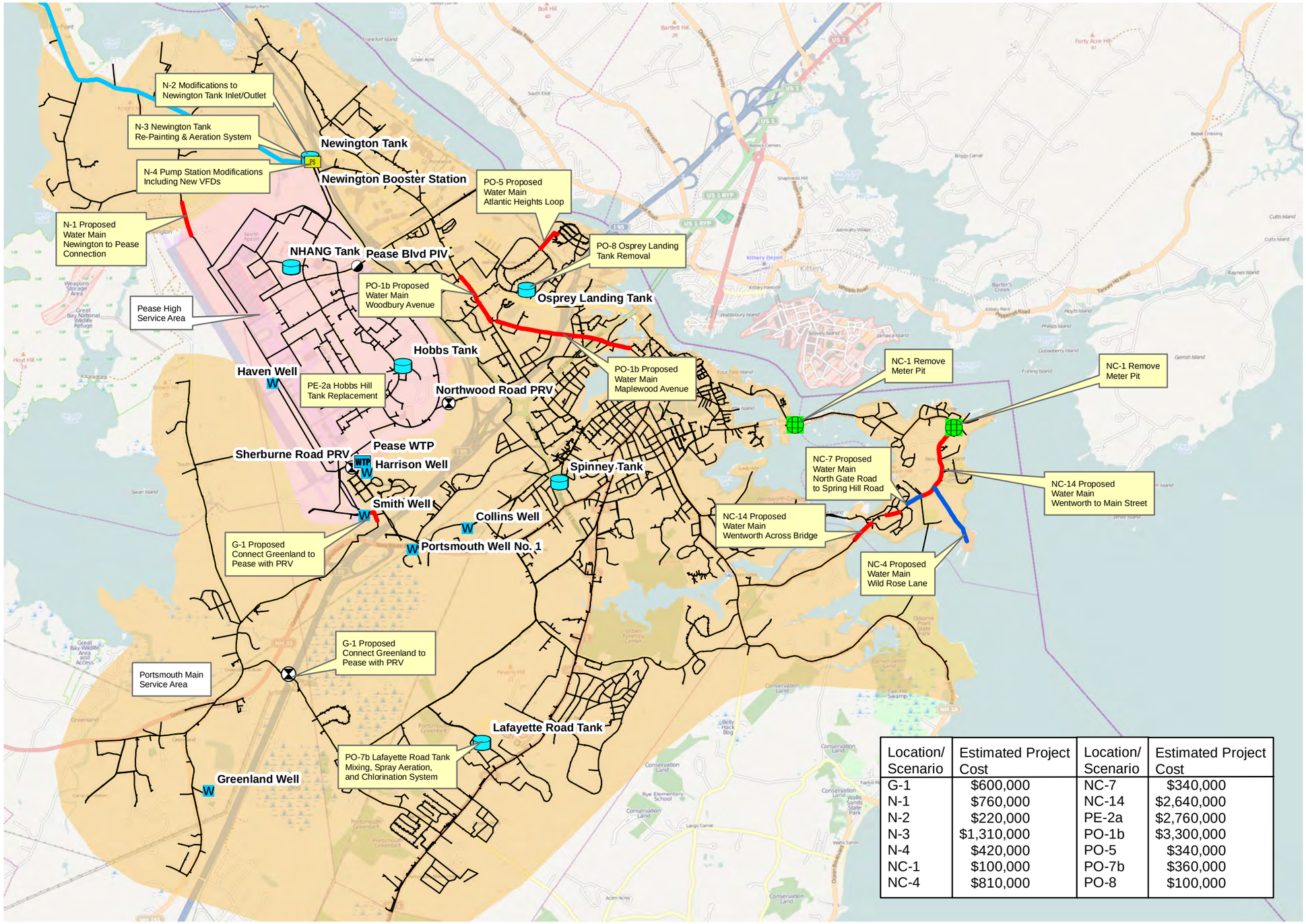
P-0625

Figure ES-4
Recommended Water Distribution Projects



Location/ Scenario	Estimated Project Cost	Location/ Scenario	Estimated Project Cost
G-1	$600,000	NC-7	$340,000
N-1	$760,000	NC-14	$2,640,000
N-2	$220,000	PE-2a	$2,760,000
N-3	$1,310,000	PO-1b	$3,300,000
N-4	$420,000	PO-5	$340,000
NC-1	$100,000	PO-7b	$360,000
NC-4	$810,000	PO-8	$100,000

Proposed Water Main

Water Main

PS Pump Station

W Well

Tank

PRV

PIV

WTP

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Portsmouth Water System
Portsmouth, New Hampshire
February 2013

Path: J:\P\P0625 Portsmouth Water System\REPORT\Arc_Map_Figures\Rec_Alts_Final.mxd

Notes

1. The Pease WTP is only used if triggered by VOC levels in monitoring wells.

LEGEND

- Direction of Flow
- Pressure Regulating Valve
- Pump Station
- Storage Tank
- Well
- Pressure Zone Elevation

Pease Pressure Zone: EL 230

Sherburne Road PRV

Northwood Road PRV

Pease Blvd. PIV (closed)

Overflow EL 230

NHANG Tank
0.4 MG

30'

Overflow EL 230

Hobbs Hill Tank
0.4 MG

30'

Main Pressure Zone: EL 171

Overflow EL 170

Osprey Landing Tank
0.2 MG

25'

Base EL 100

Overflow EL 171

Spinney Rd. Tank
1.0 MG

Base EL 51

Overflow EL 171

Lafayette Rd. Tank
7.5 MG

Base EL 75

Transmission Main Pressure Zone: EL 142

Overflow EL 142

Newington Tank
1.5 MG

Base EL 102

Newington Booster Station

Base EL 91

Base EL 91

Pease WTP[1]

Pease Booster Pumps

Haven Well

Harrison Well

Smith Well

Bellamy Reservoir
WSE 134

WTF Pumps 1-4

Madbury WTP Clearwells
0.150 MG
0.275 MG

Madbury Well #4

95' Deep

Madbury Well #3

Madbury Well #2

Collins Well

Portsmouth Well #1

Greenland Well

200

150

100

50

0

VERTICAL DATUM: USGS

HORIZONTAL SCALE: NOT TO SCALE

Figure 3-1 Distribution System Schematic - The Portsmouth Water System

The City of Portsmouth, NH

February 2013

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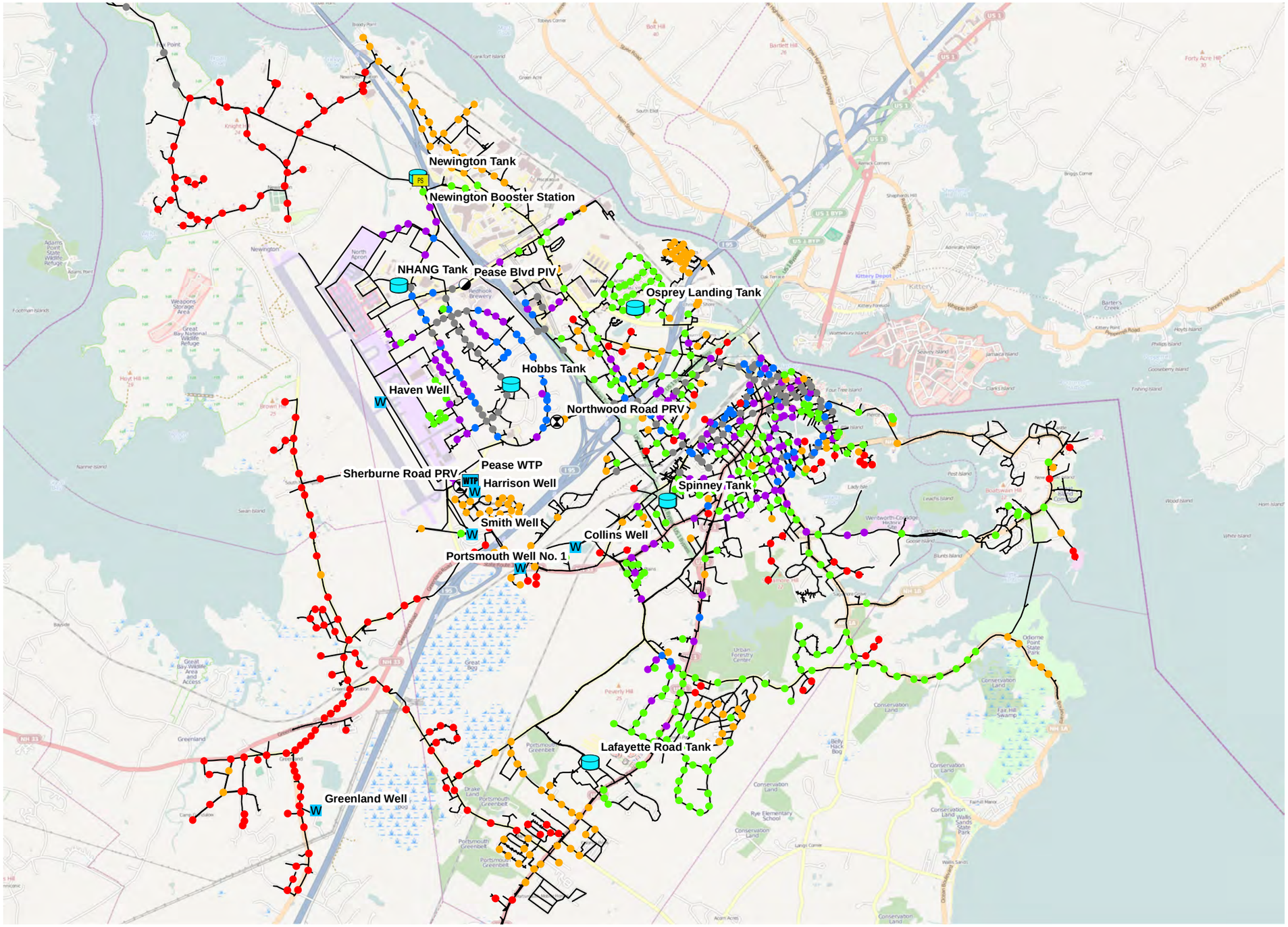

Figure 3-8
Model Predicted Available Fire Flow Maximum Day Demand (July 21-22, 2011 System Demand: 6.7 MG)

Model Predicted Available Fire Flow (gpm)

- <500
- 501 - 1000
- 1001 - 2000
- 2001 - 3000
- 3001 - 3500
- >3500

- Water Main
- Pump Station
- Well
- Tank
- PRV
- PIV
- WTP

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Portsmouth Water System
Portsmouth, New Hampshire
February 2013

Path: J:\P\P0625 Portsmouth Water System\REPORT\Arc_Map_Figures\Fire_Flow.mxd

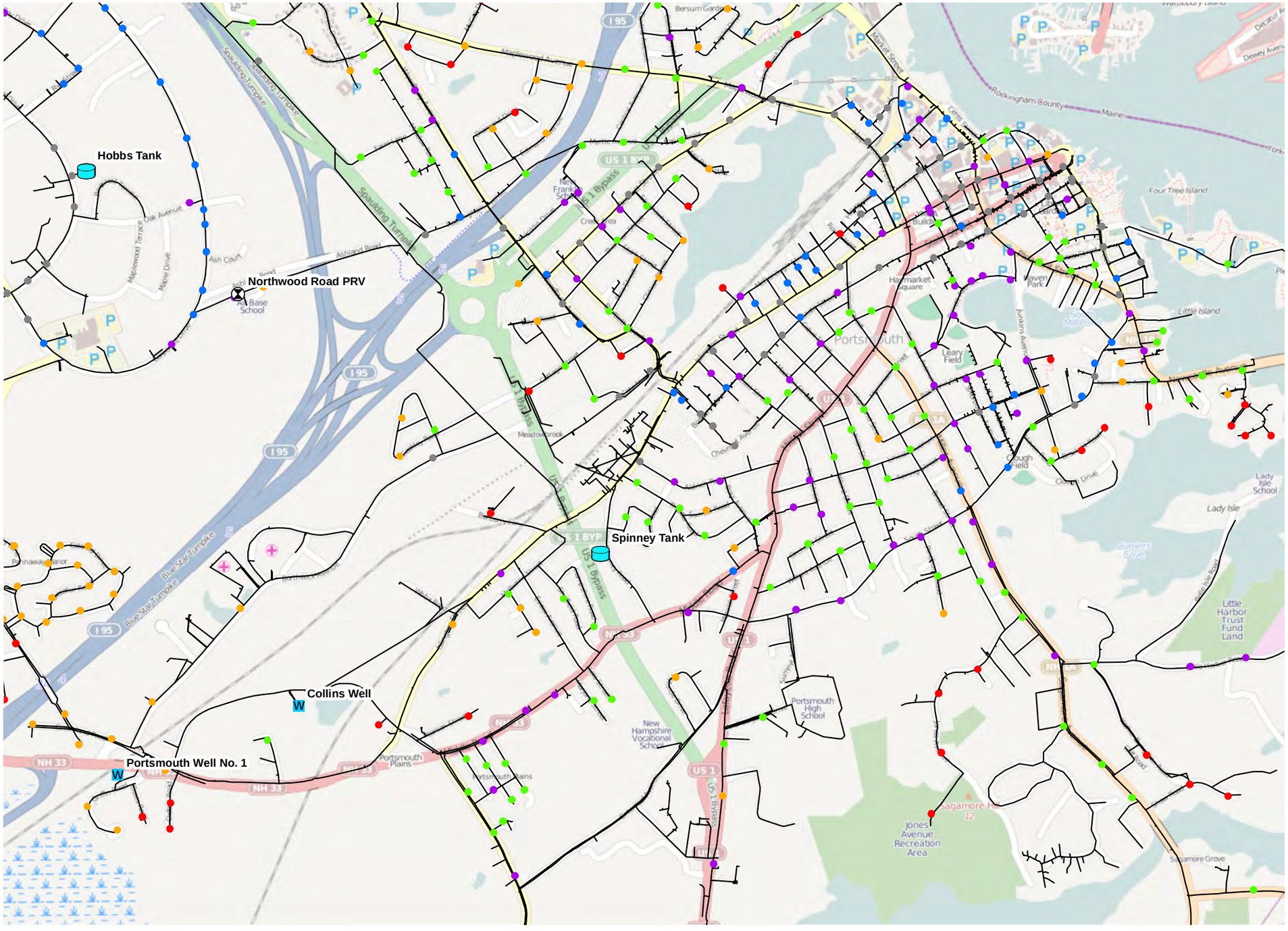

Figure 3-9
Model Predicted Available Fire Flow
Downtown Area
Maximum Day Demand
(July 21-22, 2011
System Demand: 6.7 MG)

Model Predicted Available Fire Flow (gpm)

- <500
- 501 - 1000
- 1001 - 2000
- 2001 - 3000
- 3001 - 3500
- >3500

- Water Main
- Pump Station
- Well
- Tank
- PRV
- PIV
- WTP

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Portsmouth Water System
Portsmouth, New Hampshire
February 2013

Path: J:\P\P0625 Portsmouth Water System\REPORT\Arc_Map_Figures\Fire_Flow.mxd

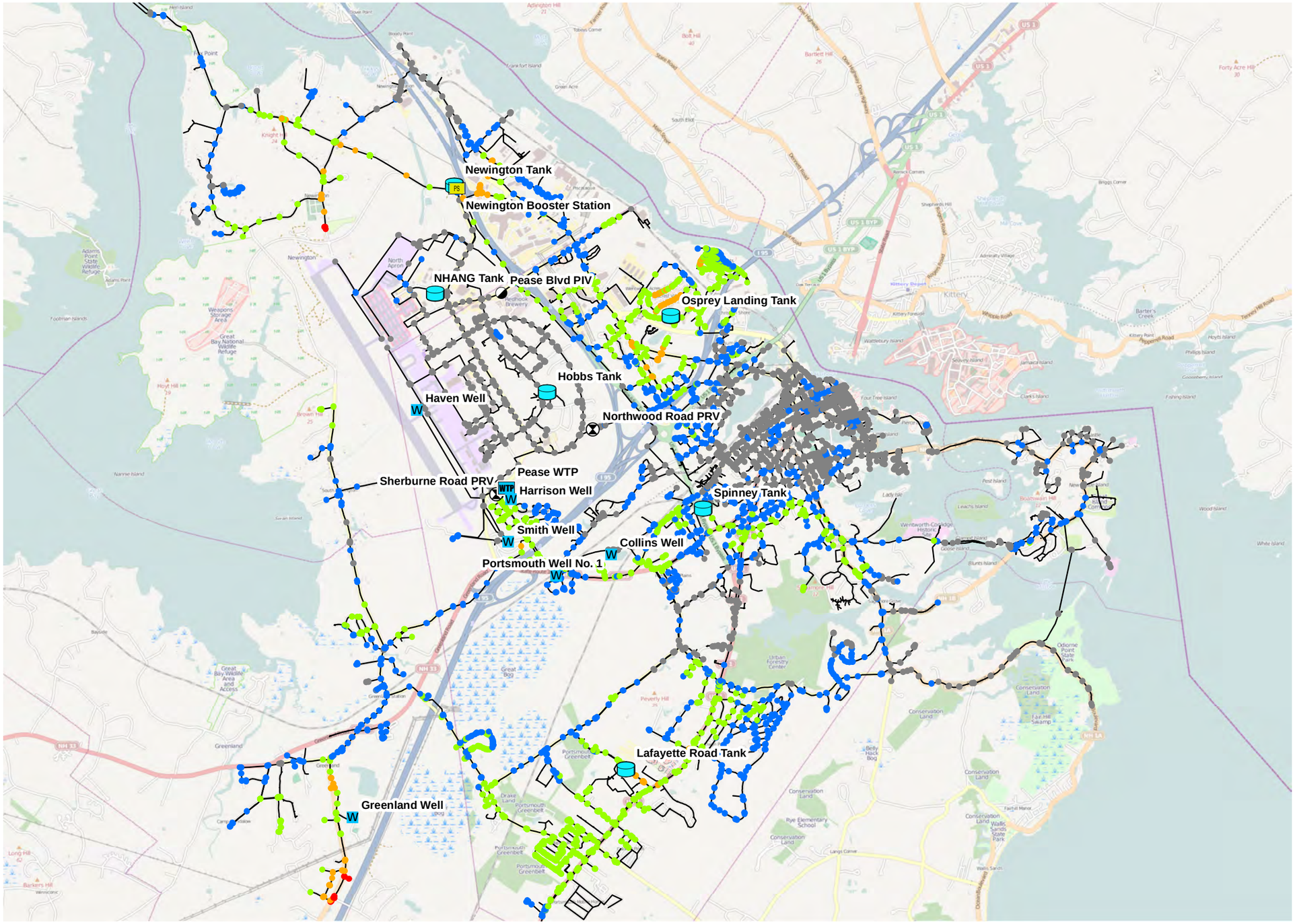

Figure 3-10
Model Predicted Minimum Pressure Maximum Day Demand (July 21-22, 2011 System Demand: 6.7 MG)

Model Predicted Minimum Pressure (psi)

- <20
- 21 - 35
- 36 - 45
- 46 - 55
- >55

- Water Main
- Pump Station
- Well
- Tank
- PRV
- PIV
- WTP

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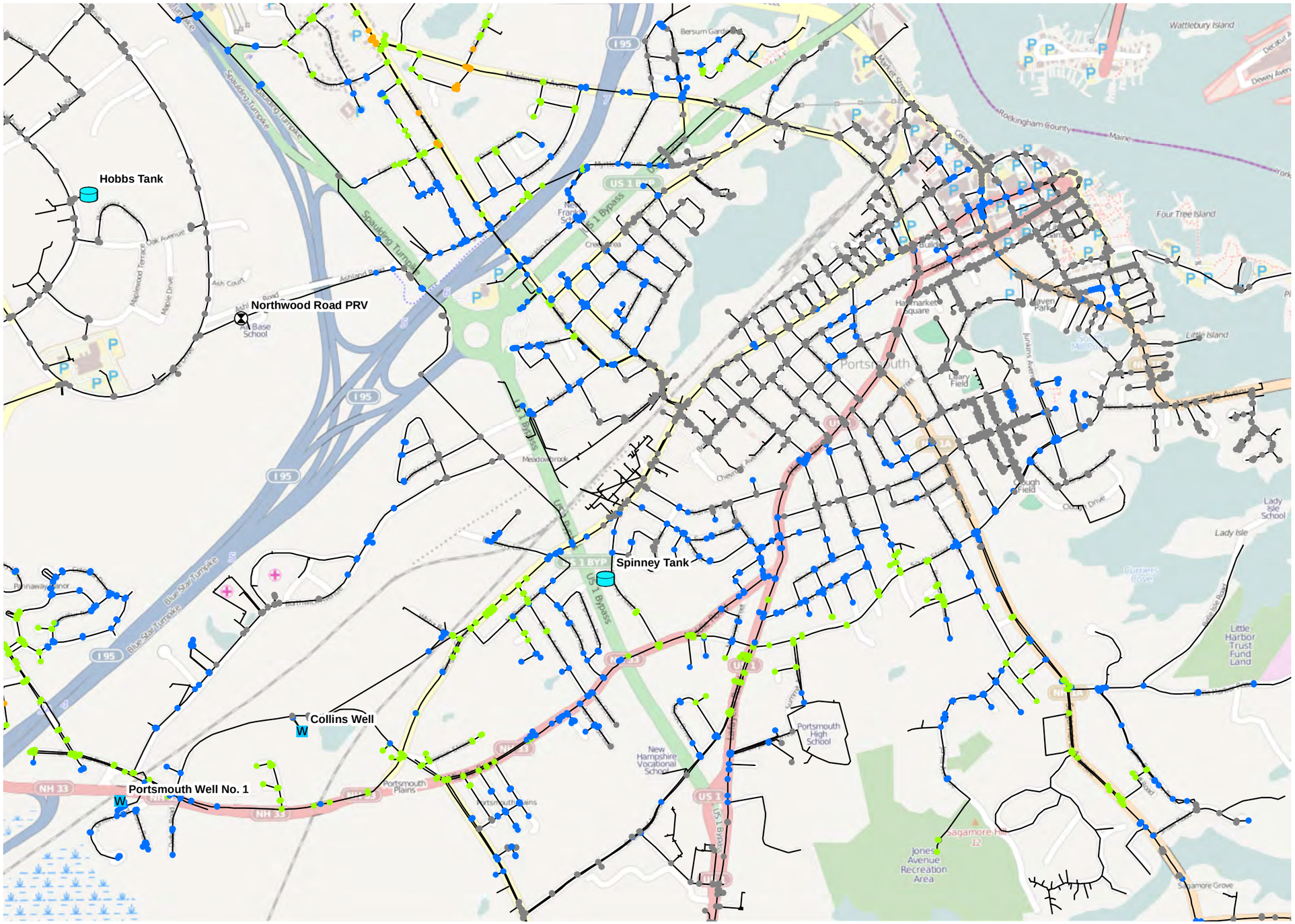
Portsmouth Water System
Portsmouth, New Hampshire
February 2013

Path: J:\P\P0625 Portsmouth Water System\REPORT\Arc_Map_Figures\Min_Pressure.mxd

Figure 3-11
Model Predicted Minimum Pressure Downtown Area Maximum Day Demand (July 21-22, 2011 System Demand: 6.7 MG)



Model Predicted Minimum Pressure (psi)

- <20
- 21 - 35
- 36 - 45
- 46 - 55
- >55

- Water Main
- Pump Station
- Well
- Tank
- PRV
- PIV
- WTP

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Portsmouth Water System
Portsmouth, New Hampshire
February 2013

Path: J:\P\P0625 Portsmouth Water System\REPORT\Arc_Map_Figures\Min_Pressure.mxd

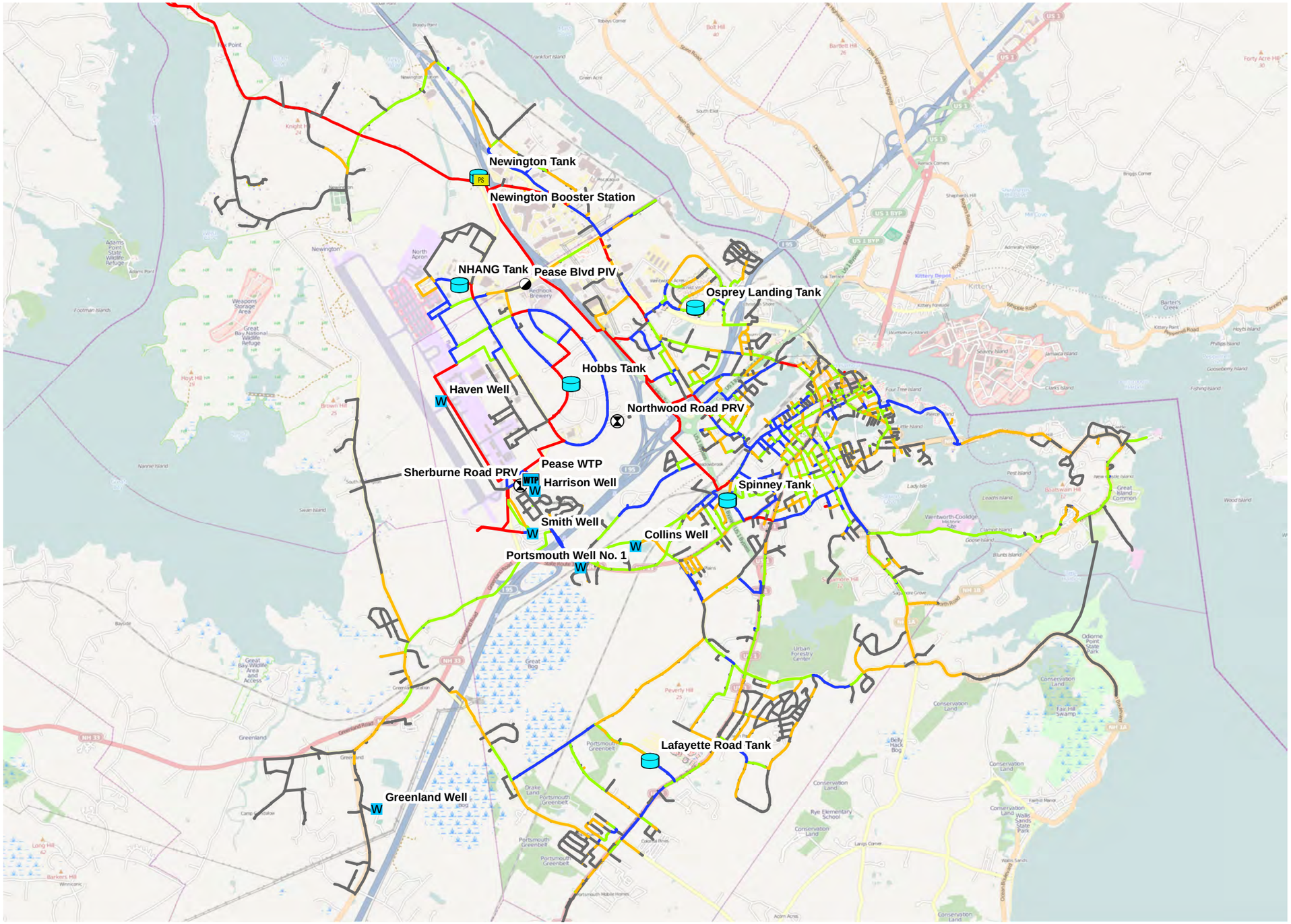

Figure 3-12
Maximum Model Predicted Velocity Maximum Day Demand (July 21-22, 2011 System Demand: 6.7 MG)

Model Predicted Velocity (ft/s)

- <0.10
- 0.11 - 0.20
- 0.21 - 0.40
- 0.41 - 1.00
- >1.00

- PS — Pump Station
- W — Well
- Tank
- PRV
- PIV
- WTP — WTP

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Portsmouth Water System
Portsmouth, New Hampshire
February 2013

Path: J:\P\P0625 Portsmouth Water System\REPORT\Arc_Map_Figures\Velocity.mxd

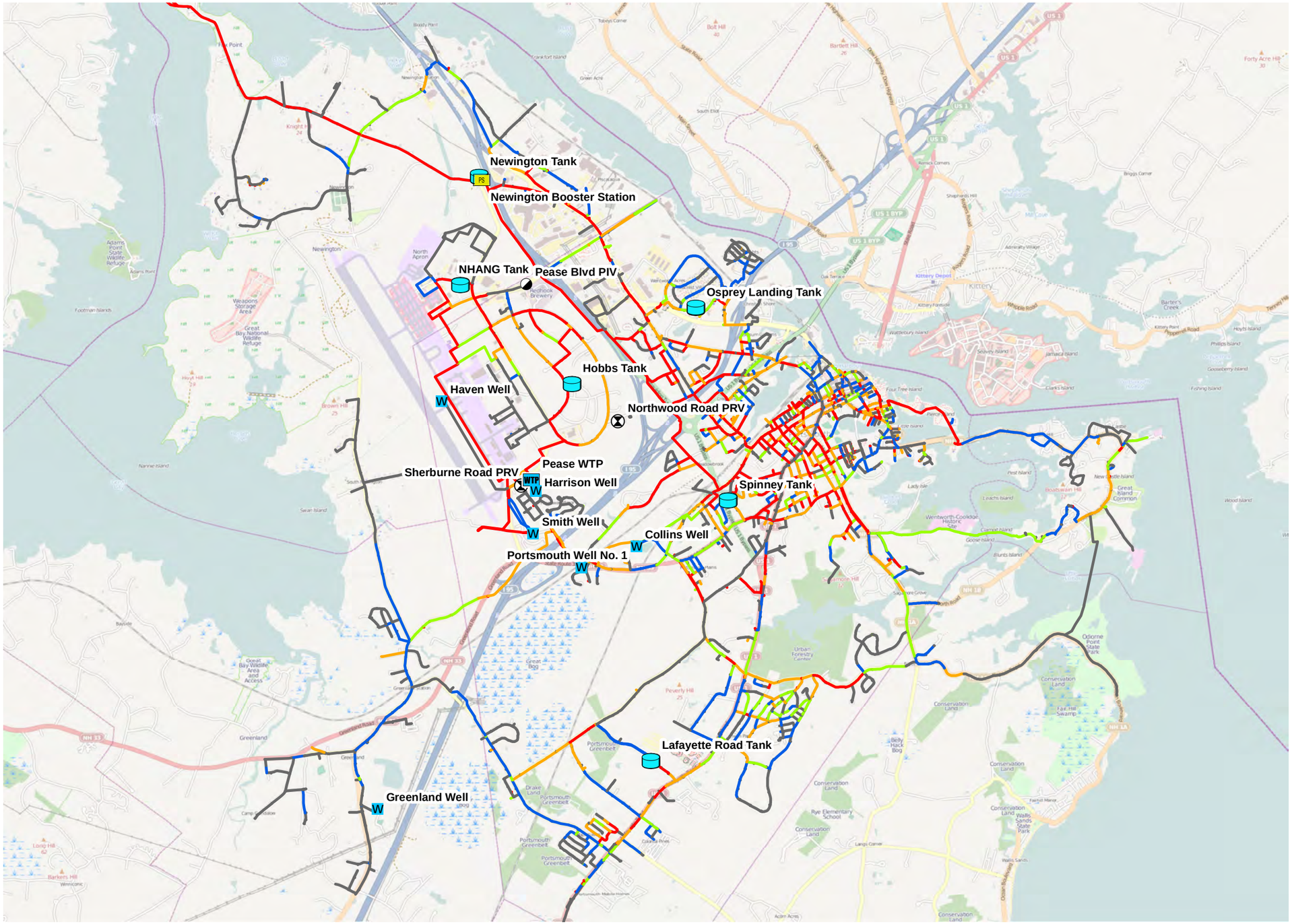

Figure 3-13
Maximum Model Predicted Head Loss Maximum Day Demand (July 21-22, 2011 System Demand: 6.7 MG)

Model Predicted Head Loss (ft) per Thousand Feet

- <0.01
- 0.02 - 0.05
- 0.06 - 0.10
- 0.11 - 0.25
- >0.25

- Pump Station
- Well
- Tank
- PRV
- PIV
- WTP

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Portsmouth Water System
Portsmouth, New Hampshire
February 2013

Path: J:\P\P0625 Portsmouth Water System\REPORT\Arc_Map_Figures\Headloss.mxd

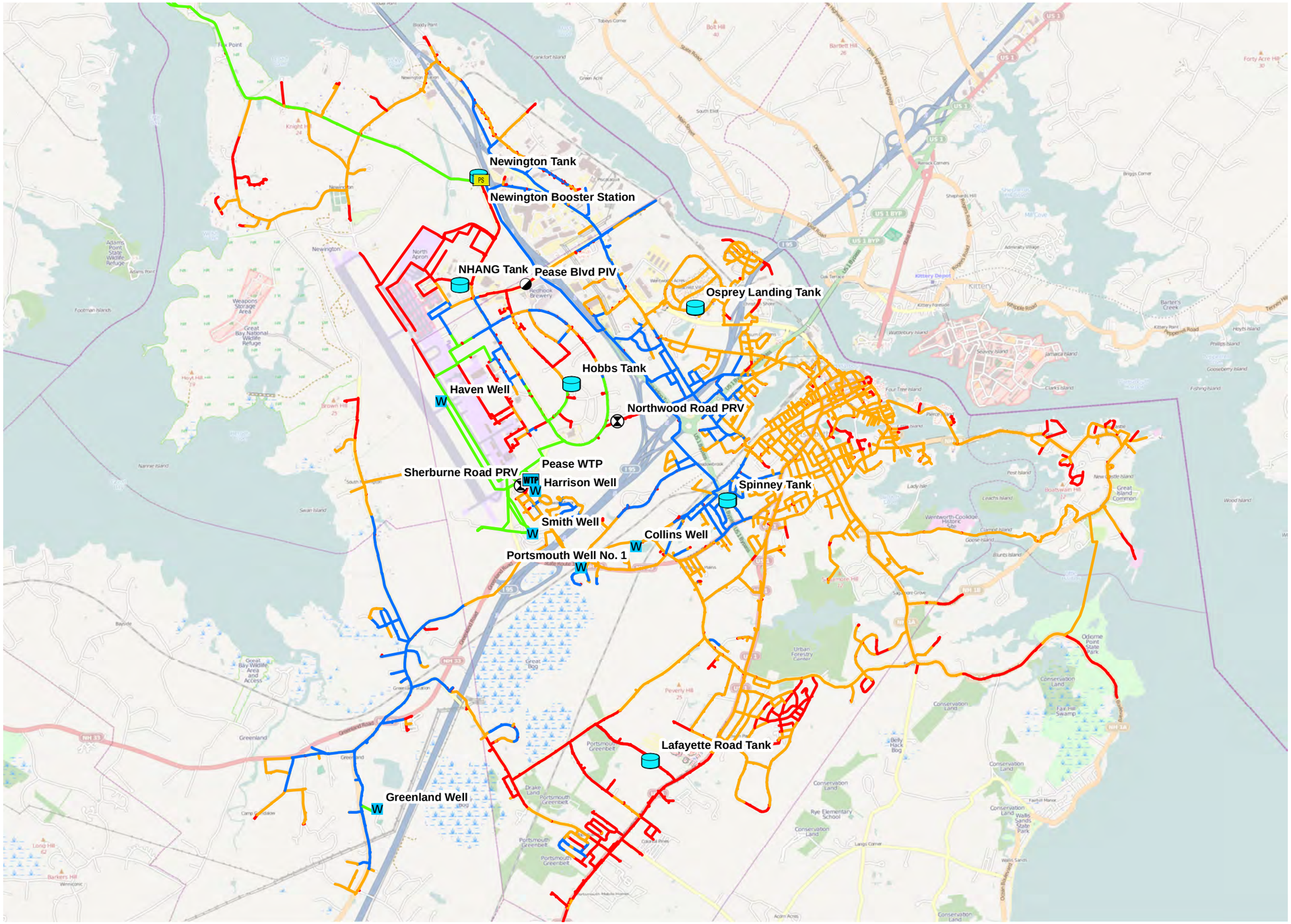

Figure 3-14
Model Predicted Water Age
Average Day Demand 4:00 PM
(May 22-23, 2011 System Demand: 4.5 MG)

Model Predicted Water Age (hrs)

- <15
- 16 - 30
- 31 - 100
- >100

- Pump Station
- Well
- Tank
- PRV
- PIV
- WTP

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Portsmouth Water System
Portsmouth, New Hampshire
February 2013

Path: J:\P\P0625 Portsmouth Water System\REPORT\Arc_Map_Figures\Water_Age.mxd

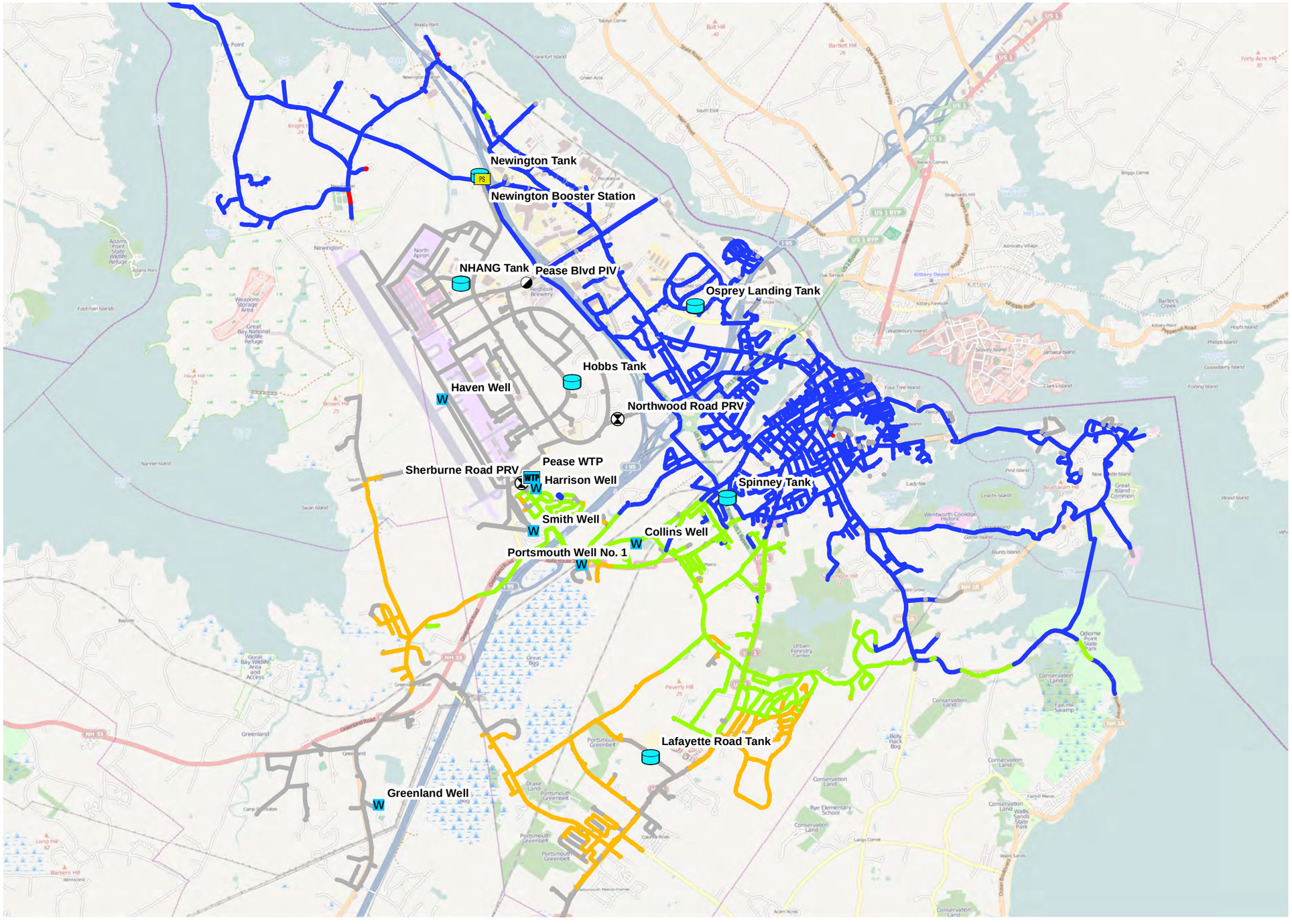

Figure 3-15
Model Predicted Surface Water Distribution Baseline Scenario Average Day Demand (May 22-23, 2011 System Demand: 4.5 MG)

Model Predicted Surface Water Contribution (%)

- <20%
- 20 - 40%
- 40 - 60%
- 60 - 80%
- >80%

- Pump Station
- Well
- Tank
- PRV
- PIV
- WTP

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Portsmouth, New Hampshire
February 2013

Path: J:\P\P0625 Portsmouth Water System\REPORT\Arc_Map_Figures\SW_Contribution-xtg.mxd

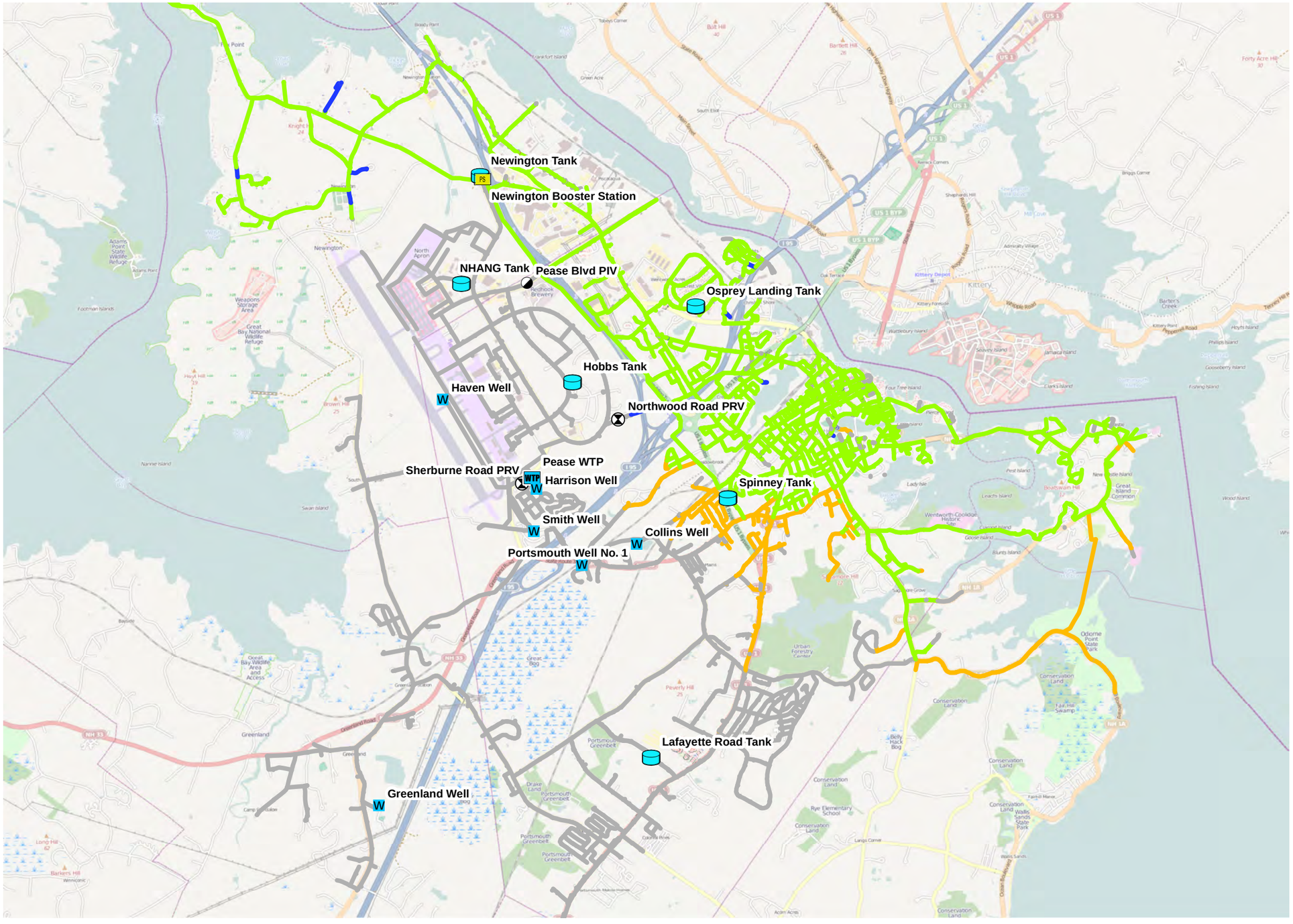

Figure 3-16
Model Predicted Surface Water Distribution Reduced Surface Water Contribution Average Day Demand (May 22-23, 2011 System Demand: 4.5 MG)

Model Predicted Surface Water Contribution (%)

- <20%
- 20 - 40%
- 40 - 60%
- 60 - 80%
- >80%

- PS — Pump Station
- W — Well
- Tank
- PRV
- PIV
- WTP — WTP

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Portsmouth Water System
Portsmouth, New Hampshire
February 2013

Path: J:\P\P0625 Portsmouth Water System\REPORT\Arc_Map_Figures\SW_Contribution-xtg.mxd

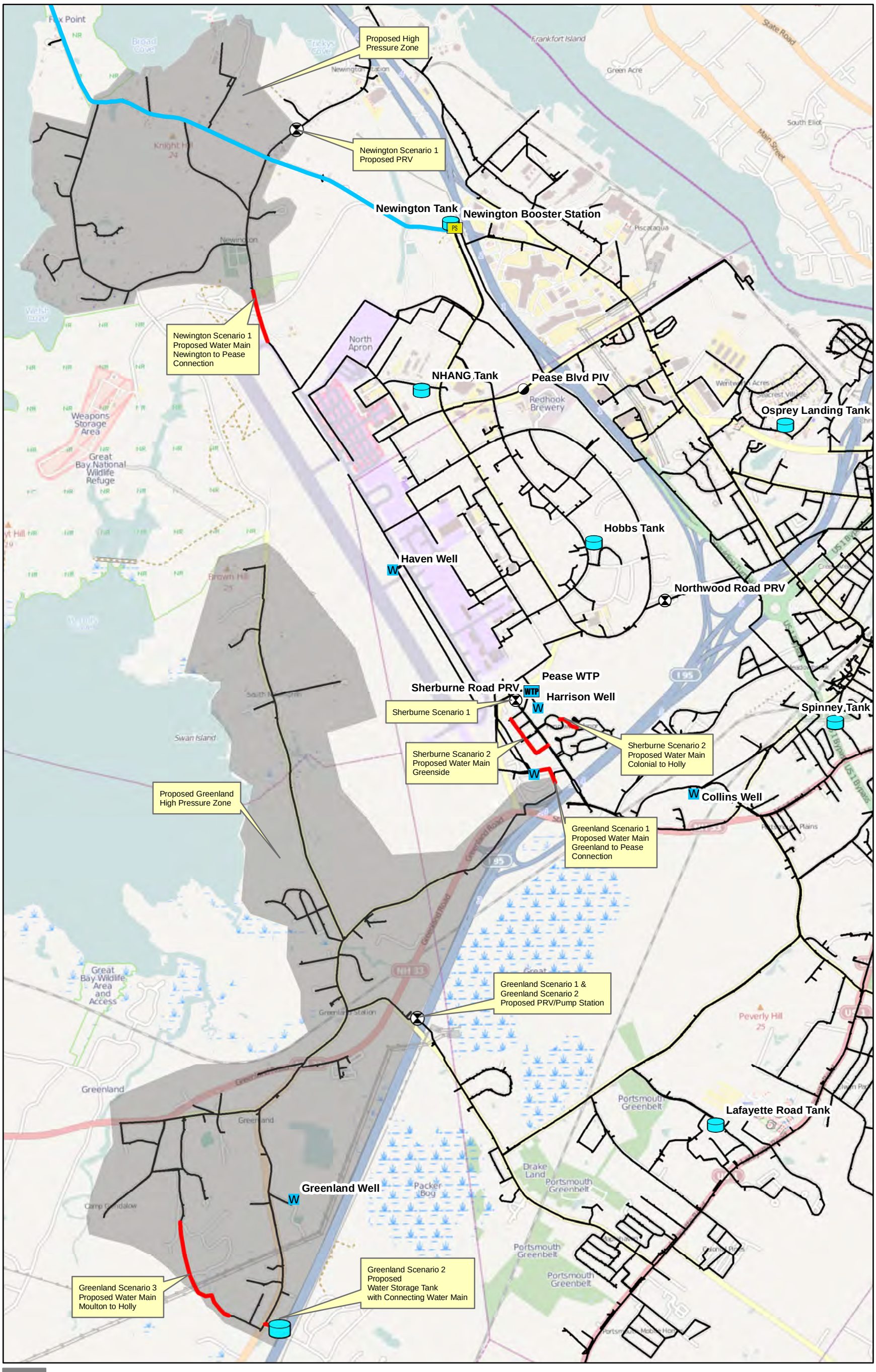

Figure 3-17
Greenland, Pease, and Newington Water System Alternatives

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Portsmouth Water System
Portsmouth, New Hampshire
February 2013

Path: J:\P\P0625 Portsmouth Water System\REPORT\Arc_Map_Figures\Greenland-Pease-Newington.mxd

Portsmouth Scenario 5
Proposed Water Main
Atlantic Heights Loop

Portsmouth Scenario 1
Proposed Water Main
Woodbury Avenue

Osprey Landing Tank

Portsmouth Scenario 1
Proposed Water Main
Maplewood Avenue

Portsmouth Scenario 2
Proposed Water Main
Islington

Portsmouth Scenario 6
Proposed Water Main
North Mill Pond

Portsmouth Scenario 2
Proposed Water Main
Chapel

Northwood Road PRV

Portsmouth Scenario 3
Proposed Water Main
Miller Avenue

Spinney Tank

Collins Well

Portsmouth Scenario 4
Proposed Water Main
Lafayette Road

Existing Water Main
Proposed Water Main
Pump Station
Well
Tank
PRV

Figure 3-18
Portsmouth Water System Alternatives

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Portsmouth Water System
Portsmouth, New Hampshire
February 2013

Path: J:\P\P0625 Portsmouth Water System\REPORT\Arc_Map_Figures\Portsmouth_Area.mxd

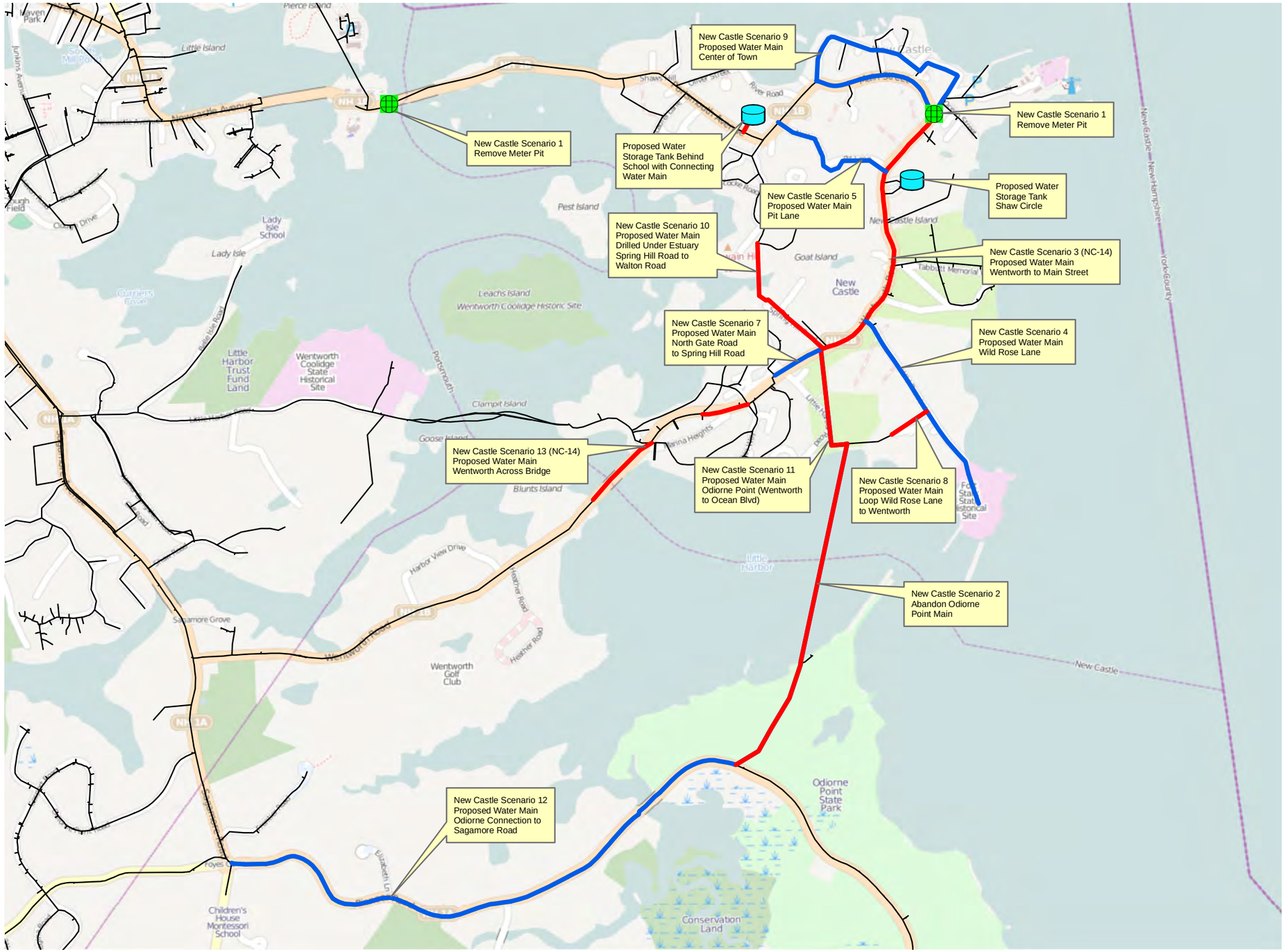

Figure 3-20
New Castle Water System Alternatives

- Water Main
- Water Main Improvement
- PS — Pump Station
- W — Well
- Tank
- PRV
- Remove Meter Pit

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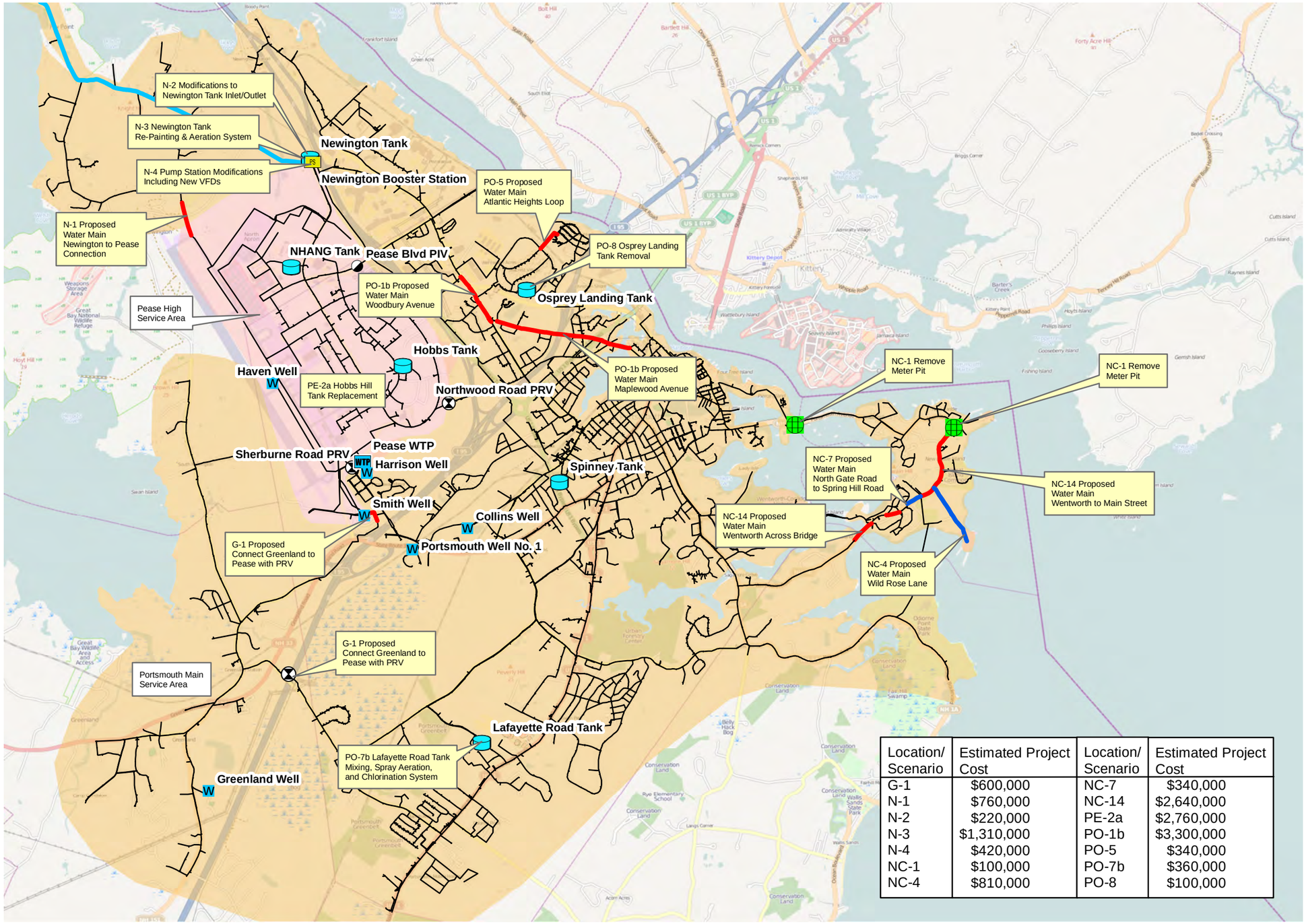
Portsmouth Water System
Portsmouth, New Hampshire
February 2013

Path: J:\P\P0625 Portsmouth Water System\REPORT\Arc_Map_Figures\New_Castle_Area.mxd

Figure 4-1
Recommended Water Distribution Projects



Location/ Scenario	Estimated Project Cost	Location/ Scenario	Estimated Project Cost
G-1	$600,000	NC-7	$340,000
N-1	$760,000	NC-14	$2,640,000
N-2	$220,000	PE-2a	$2,760,000
N-3	$1,310,000	PO-1b	$3,300,000
N-4	$420,000	PO-5	$340,000
NC-1	$100,000	PO-7b	$360,000
NC-4	$810,000	PO-8	$100,000

Proposed Water Main

Water Main

PS Pump Station

W Well

Tank

PRV

PIV

WTP

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Portsmouth, New Hampshire
February 2013

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