CITY OF PORTLAND
ENVIRONMENTAL SERVICES

1120 SW Fifth Avenue, Room 1000, Portland, Oregon 97204 ▪ Ted Wheeler, Mayor ▪ Michael Jordan, Director

M E M O R A N D U M

TO: Morgan Tracy, BPS Residential Infill Project Manager

FROM: Fred MacGregor, BES Stormwater System Planning Manger FM

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RE: Residential Infill Project

DATE: March 6, 2020

Portland's Bureau of Environmental Services (BES) appreciates the opportunity to participate in the development of the Residential Infill Project (RIP). Environmental Services manages Portland's wastewater and stormwater infrastructure to protect public health and the environment. BES understands the challenges Portland is facing with expected growth and housing demands over the next twenty years and the important role that the project will have in helping Portland meet these demands in a sustainable manner. We offer the following comments on the RIP proposal, as it relates to the City's sanitary and stormwater systems.

Background

House Bill 2001, passed by the State of Oregon, requires cities of 25,000 people and more to allow duplexes on all lots where single houses are currently allowed, and triplexes and fourplexes in areas zoned for residential use. The Residential Infill Project is considering new rules to allow these housing types and thereby increase density of housing in the R2.5, R5, and R7 single-family residential zones. Additionally, the RIP proposal includes allowances for two accessory dwelling units with a house, or one accessory dwelling unit with a duplex. Furthermore, RIP includes provisions for up to 6 dwelling units, when certain levels of affordable housing units are proposed, which are anticipated in extremely limited occurrences[1].

To ascertain and analyze potential impacts from proposed changes to the City's single dwelling residential zones (specifically new allowances for duplexes, triplexes and fourplexes in R7, R5, and R2.5 zones), Bureau of Planning and Sustainability (BPS) revised and reran the Comprehensive Plan land capacity and growth allocation model (BLI model). The potential increase in dwelling units relative to the current zoning allowances is shown in Figure 1. BPS has proposed a 'z' overlay as part of the RIP, which would restrict 3 or more units on lots within landslide-prone areas, 100 year floodplain, and areas of inventoried natural resources. The infrastructure bureaus have reviewed the current RIP proposal, including the 'z' overlay, and

[1] Refer to memorandum from BPS staff dated March 9, 2020, regarding the economic feasibility of the deeper affordability bonus.

performed an analysis of potential impacts to public infrastructure. We are providing the results of this analysis for the City's sanitary and stormwater systems.

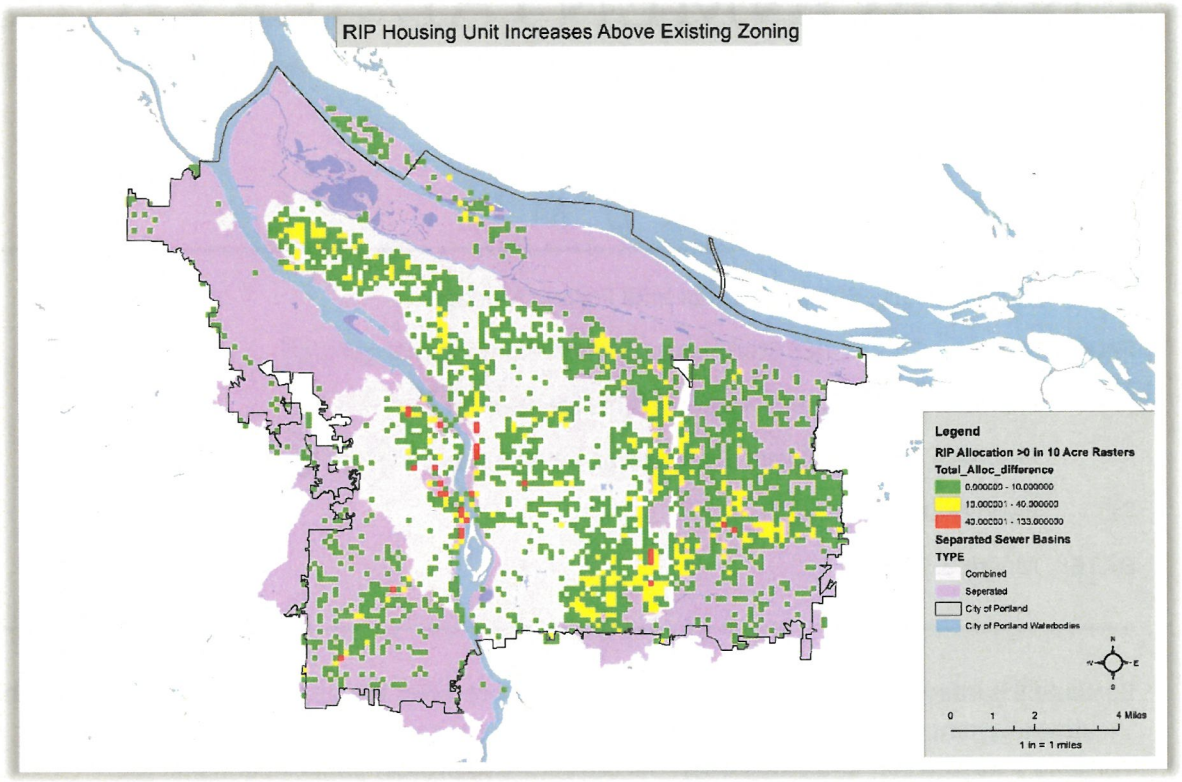

Figure 1 - Increase in dwelling units relative to the Buildable Lands Inventory – 10-Acre Grid

Service Areas

As shown in Figure 2, the east, west, and north portions of the city are served by separated sanitary and storm sewer systems (green shaded areas). The central portions of the city are generally served by combined sanitary and storm sewers (tan shaded areas). Large portions of the city on the east side of the Willamette River utilize Underground Injection Control (UIC, brown shaded areas) systems to infiltrate stormwater into the ground, thereby reducing runoff. The cross-hatched areas are served by both combined and UIC systems.

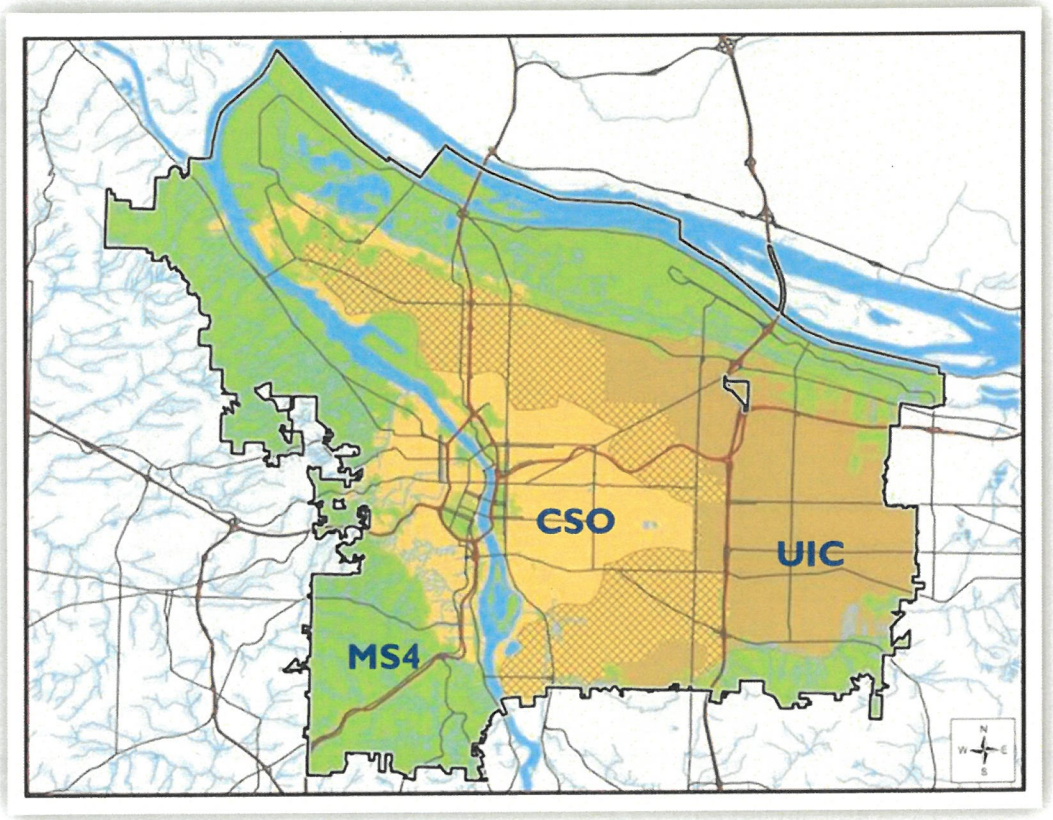

Figure 2 – Stormwater system areas

Analysis of Impacts in Combined Sewer Service Area

The City of Portland's 2035 Comprehensive Plan Citywide Systems Plan (CSP) identified that some areas in the combined system are affected by localized hydraulic capacity limitations that increase the risk of basement sewer backups and/or street flooding. These areas are concentrated close in on the east side with scattered areas in other parts of the system. A number of projects to address this hydraulic deficiency were included in the proposed Investment Strategy in the CSP.[2] BES does not anticipate that the RIP proposal will cause an increase in the combined sewer hydraulic capacity limitations identified in the CSP. Sanitary flow is a minor component in the combined system when compared to stormwater flows, and much of the projected infill is within the UIC boundary where the sewers and wastewater treatment facilities tend to have excess capacity, and stormwater runoff from future development can be infiltrated into the soil (Figure 3).

[2] City of Portland, *2035 Comprehensive Plan Citywide Systems Plan*, June 2016, p. 85, 119-133.

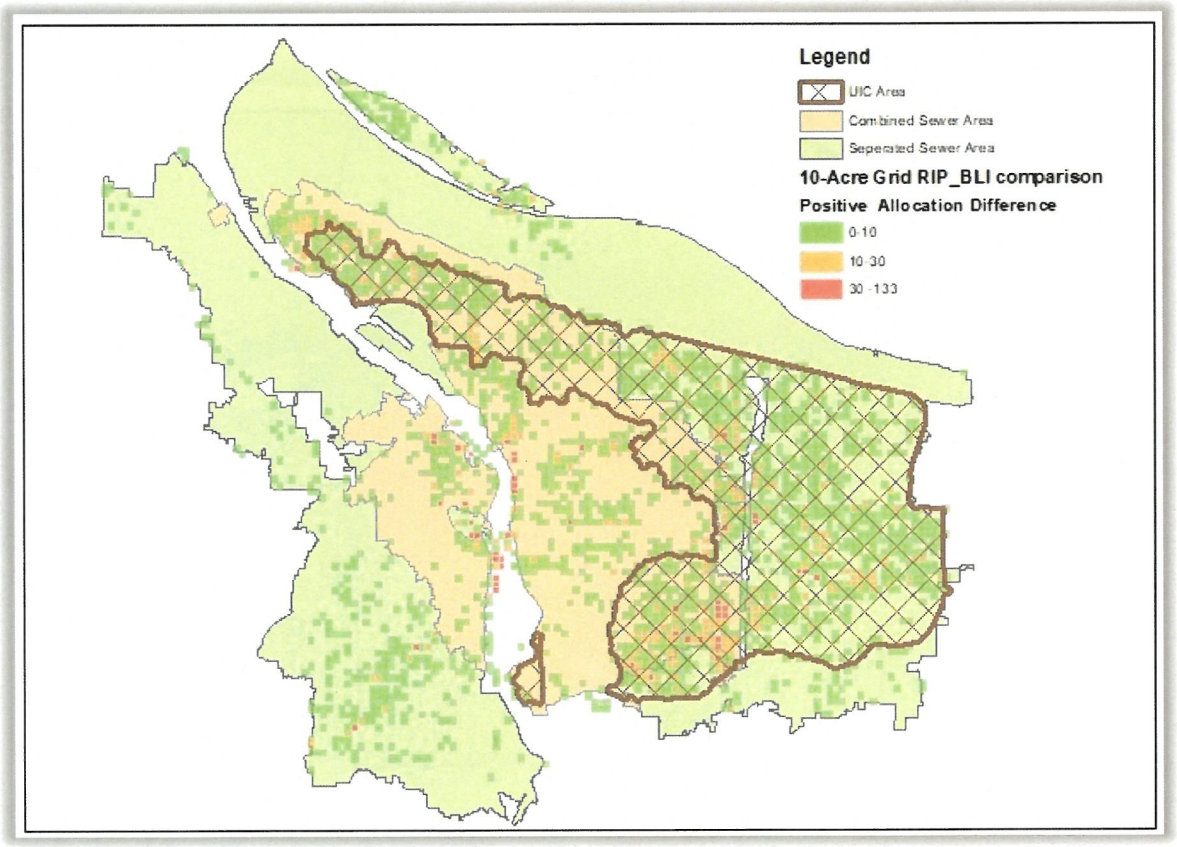

Figure 3 – Residential Infill and UIC Areas

BES has already identified a series of projects in the CSP Collection System Investment Strategy to address capacity deficiencies in the combined system over the next 20 years.[3] Any contribution to these deficiencies caused by the additional densities allowed through the RIP will be addressed through these planned projects. BES employs an asset management model and continuously monitors the capacity of the combined system, constructing capital improvements to mitigate flooding risk and to limit combined sewer overflows in compliance with the City's regulatory permits[4]. BES will continue this practice as residential infill and other development activity occurs. Therefore, BES has concluded that the combined sewer system, with planned projects included in the adopted CSP, is adequate or will be adequate to accommodate the forecasted growth from RIP.

Analysis of Impacts in Separated Service Areas

Most of the properties zoned R7, R5, and R2.5 in the separated area are served by sanitary sewers. Currently there are minimal capacity issues in these sewers, except for areas where we experience stormwater inflow or infiltration (I&I) into the sanitary system[5]. BES manages a program to reduce I&I to reduce the need for wastewater treatment capacity and limit pollution entering the sanitary system. As infill occurs, BES will monitor sanitary flows, identify necessary conveyance improvements, and implement capital projects to adequately respond to infrastructure needs and prevent sewage releases to surface waters, consistent with State and Federal regulations. Therefore, with these ongoing improvements already identified in the

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[3] City of Portland, *2035 Comprehensive Plan Citywide Systems Plan*, June 2016, p. 133.

[4] City of Portland, *2035 Comprehensive Plan Citywide Systems Plan*, June 2016, p. 117.

[5] City of Portland, *2035 Comprehensive Plan Citywide Systems Plan*, June 2016, p. 126-127, 133.

adopted CSP, sanitary sewer infrastructure is adequate or will be adequate as development occurs.

Assessing the RIP's potential impacts on the City's management of stormwater in the separated areas is a complex issue. BES manages a complicated network of pipes and ditches, streams and wetlands, engineered facilities, drainageways, and infrastructure to convey, detain, and treat stormwater runoff. In areas that were developed prior to being annexed to the City of Portland, development standards and regulations were not as comprehensive as they are today. The result is stormwater systems that are fragmented, incomplete and, in some cases, in poor condition.

Increased or new development can pose challenges to the operation and function of the existing stormwater system. The magnitude of the challenges varies by geographically-specific factors such as topography, soils, system maturity, and the type of stormwater system (separated, combined or UIC). Infiltration is generally the most cost-efficient means of mitigating the runoff from impervious surfaces such as asphalt, concrete and roofs.

Generally, residential infill will be easier to accommodate on the east side of the Willamette River where soils allow stormwater infiltration and the BES Stormwater Management Manual (SWMM) will require runoff from potential increases in impervious area to remain on site.

In areas west of the Willamette River, there is less ability to infiltrate stormwater to the groundwater aquifer due to less permeable soils, steeper topography and geologic factors such as landslide susceptibility and shallow confining soil layers. Without the ability to infiltrate, the cost of mitigating the effects of impervious area and reduced vegetative cover increases, especially in areas where stormwater system deficiencies already exist.

Our spatial analysis shows that approximately 6% of the residentially zoned taxlots within the RIP boundary likely do not have adequate stormwater service. Extending or providing service to these taxlots can be challenging, both from a financial perspective and because construction of service extensions can create ancillary needs, such as downstream capacity upgrades and roadway development (e.g. adding curbs and inlets). Typically, when a development application is reviewed and it's determined that service is not available, the burden is on the developer to extend the stormwater service or wait until BES plans, designs and implements a Capital Improvement Project to provide the needed service. Figure 4 is a heat map of existing taxlots which, based on our spatial analysis, have a higher likelihood of inadequate stormwater service.

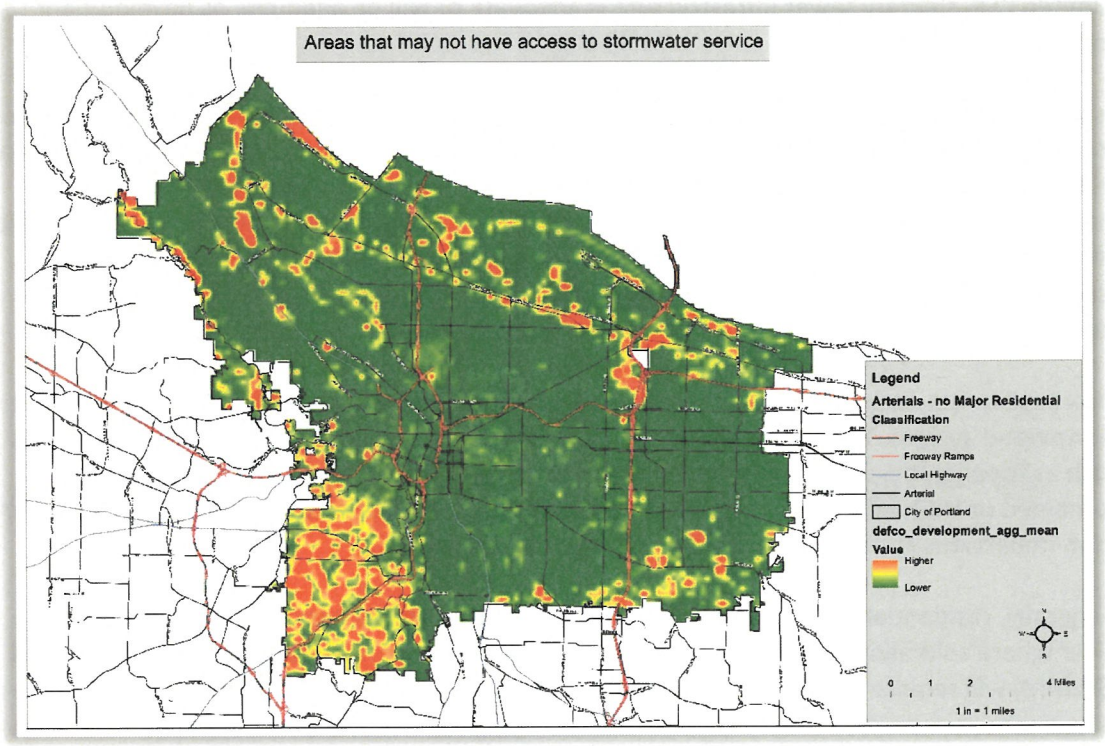

Figure 4 - Heat map of areas that may not have access to stormwater service

Other factors that create challenges for the stormwater system are areas susceptible to landslides, areas within mapped or observed floodplains, and areas of high-value natural resources. BES has worked closely with BPS to analyze and define the impacts that the RIP could potentially have on these conditions or resources. The currently proposed 'z' overlay addresses these issues (landslides, natural resources, and floodplains) by limiting lots in these areas to no more than two units. HB2001 prevents further density limitations in that it requires cities to allow duplexes wherever houses are allowed. Moreover, current zoning already allows duplexes on corner lots or a house with an accessory dwelling unit.

Many of the neighborhoods with challenging soils and topography are located on Portland's west side. However, RIP models project a decrease in likely residential development on the west side. The BLI allocated 4,172 units to single family zones in the western neighborhoods. The RIP household allocation model predicts 2,509 units, a difference of 1,663 units or about a 40% reduction of households. About 1200 of the units are removed from lower density residential zones (R10, R20, RF) where stormwater and sewer services are even more challenging, and roughly 400 of the units are removed from RIP zones. These reductions are offset by increased households in inner and eastern neighborhoods, where stormwater systems are adequate, as a result of increased zoning capacity in those areas (see Figure 5).

In addition, because RIP allows for multiple units to be constructed on a single lot (up to four, or six when providing regulated affordable units) instead of the single house allowed by current 2035 Comprehensive Plan zoning, the net redevelopment activity in the western district is further reduced. Building coverage limits are unchanged from current allowances and total allowable building size is reduced through caps on floor area (FAR). While triplexes and fourplexes will utilize more FAR than houses or duplexes, they are still smaller than what is permissible under the current zoning rules for a single house. These FARs work in conjunction with building coverage limits to encourage more multi-story buildings, which reduces effective

building coverage. Moreover, onsite parking is now optional, providing more opportunities to leave more of the site permeable.

This combination of reduced predicted allocation on the west side and smaller allowed FAR and building coverage results in a neutral impact on the current separated stormwater system. Any localized deficiencies will be addressed at the time of development or through capital projects identified in the adopted CSP[6].

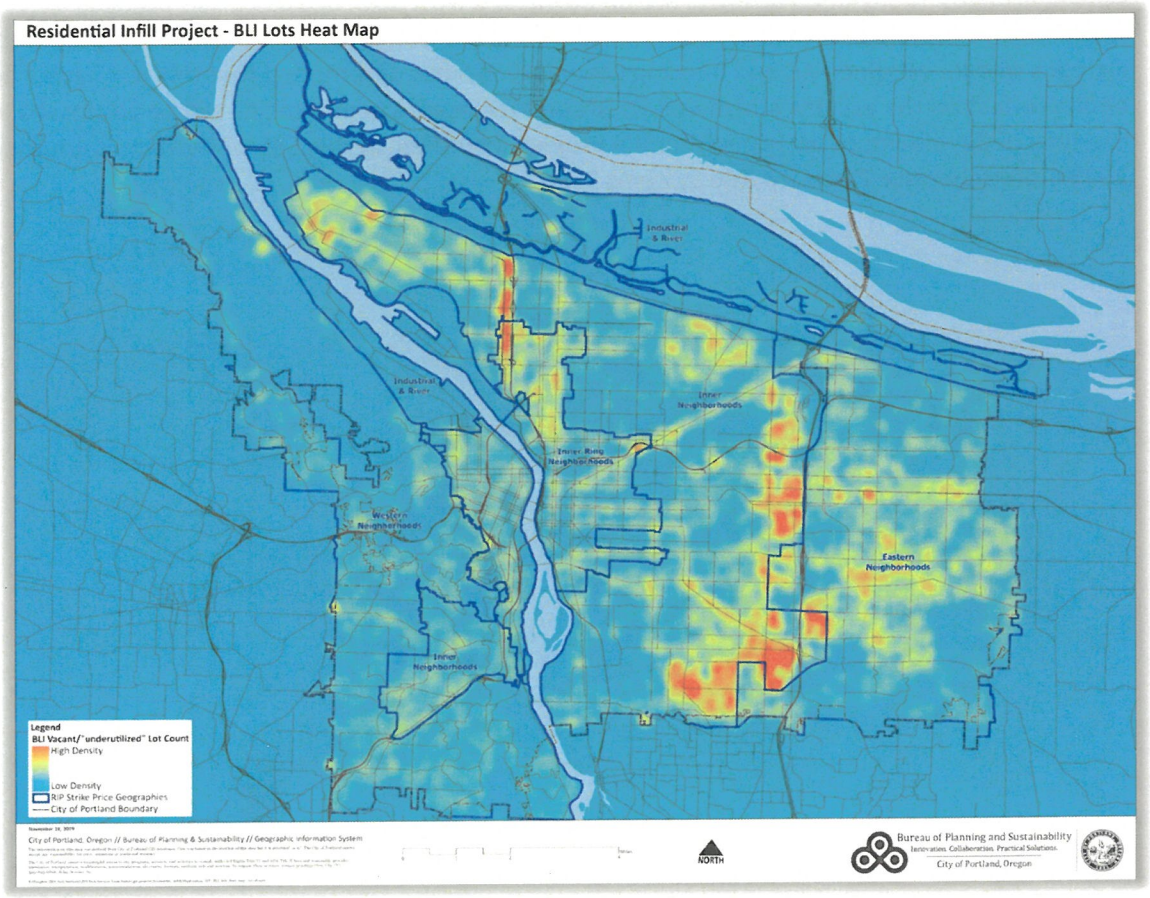

Figure 5 - BLI Heat Map

Summary

Combined Sewer Areas

BES has no objection to the RIP proposal in the combined sewer areas and finds the adequacy of sewer and stormwater infrastructure in these areas will not be negatively impacted by RIP. BES regularly analyzes our system, in conjunction with planning projections from BPS, and determines priority areas for both capacity and structural upgrades, as identified in the City of Portland's adopted 2035 Comprehensive Plan Citywide Systems Plan. Over time, these capital projects will address any localized issues created through the increased densities allowed by the RIP.

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[6] City of Portland, *2035 Comprehensive Plan Citywide Systems Plan*, June 2016, p. 142-152.

Separated Sewer Areas

BES has no objection to the RIP proposal for sanitary sewers within the separated sewer areas and finds the adequacy of sewer infrastructure in these areas will not be negatively impacted by RIP.

For stormwater service within the separated sewer areas, those areas with a limited ability to infiltrate, steep topography, and lack of existing established stormwater conveyance systems pose challenges. Many of these areas are on Portland's west side. BPS's analysis predicts a reduction of development on the west side relative to the Comp Plan BLI, and the RIP proposal includes smaller allowed FAR and building coverage. BES has determined that this will have a net neutral effect on the existing stormwater system. Any localized deficiencies will be addressed at the time of development or through capital projects identified in the City of Portland's adopted 2035 Comprehensive Plan Citywide Systems Plan.