M E M O R A N D U M

TO:	Tony Konkol, Community Development Director John M. Lewis, P.E., Public Works Director Carrie Richter, Deputy City Attorney
Cc:	Pete Walter, Associate Planner
FROM:	Aleta Froman-Goodrich, P.E., City Engineer
DATE:	January 5, 2015
SUBJECT:	**AP 14-01**: Applicant's appeal of Condition of Approval No. 37 of the Community Development Director's land use approval on November 14, 2014 of file number **SP 14-01**, a Site Plan and Design Review application for 121 Apartment Units and 62 Live-Work Units on 9.7 acres (Zoned MUC-1).

STAFF RECOMMENDATION

Staff recommends the City Commission deny the Appeal (AP 14-01), uphold the Community Development Director's decision to conditionally approve the applicant's request to construct 121 Apartment Units and 62 Live-Work Units on 9.7 acres on the east side of Beavercreek Road, with no change to the conditions of approval for Condition of Approval No. 37.

BASIC FACTS

The Site Plan and Design Review application SP 14-01 was submitted by the applicant, Beavercreek Road LLC, for review by the Community Development Director on January 22, 2014. The application was deemed incomplete on February 20, 2014, and upon submittal of additional materials, was deemed complete for review on July 11, 2014. The application was subject to two public comment periods due to new information submitted into the record by the applicant to support their sewer and water system proposal for the development. Following the two public comment periods and review by staff, the Community Development Director conditionally approved the application on November 14, 2014. The current extended 120-day decision deadline for this SP 14-01 is February 4, 2015.

PROPOSAL

(See Project Overview on Page 8 of SP 14-01 Staff Report)

The proposed project, Beavercreek Rd Apartments, is a combination of 121 rental apartments and 62 live-work units that form a village concept. The site is a cornerstone for possible future expansion of currently un-zoned land around it. This property and the un-zoned land around it is in the Beavercreek Road Concept Plan.

The proposed community's mix of live-work ground floor commercial and regular apartments provides opportunities for meeting the Mixed Use Corridor base zoning of the site while also meeting the intent of the soon-to-be-adopted Beavercreek Road Concept Plan – Mixed Employment Village.

APPLICANT'S REASON FOR APPEAL AP 14-01

The Applicant, Beavercreek Road, LLC, submitted an appeal of SP 14-01 decision on November 26, 2014. The applicant stated:

Condition of approval No. 37 imposes a fee in lieu of $545,000. Section 17.62.040(14) requires the applicant to modify or replace existing off-site systems if necessary to provide adequate public facilities. The applicant believes that the amount of the fee in lieu is in excess of what is required under Section 17.62.040(14).

Note: The Applicant has referenced the incorrect section of the code in Appeal 14-01. The code that should have been referenced is OCMC ***Section 17.62.050 A. 14.*** **Staff has made consideration of this error and has addressed the issues raised by the applicant based on *Section 17.62.050 A. 14.***

> *OCMC Chapter 17.62 Site Plan and Design Review*
> *17.62.050 - Standards.*
> *A. All development shall comply with the following standards:*
> *14. Adequate public water and sanitary sewer facilities sufficient to serve the proposed or permitted level of development shall be provided. The applicant shall demonstrate that adequate facilities and services are presently available or can be made available concurrent with development. Service providers shall be presumed correct in the evidence, which they submit. All facilities shall be designated to city standards as set out in the city's facility master plans and public works design standards. A development may be required to modify or replace existing offsite systems if necessary to provide adequate public facilities. The city may require over sizing of facilities where necessary to meet standards in the city's facility master plan or to allow for the orderly and efficient provision of public facilities and services. Where over sizing is required, the developer may request reimbursement from the city for over sizing based on the city's reimbursement policy and fund availability, or provide for recovery of costs from intervening properties as they develop.*

Staff Findings

The City's 2014 Sanitary Sewer Master Plan (SSMP) recommends a sanitary sewer facility improvement program to improve the existing sanitary sewer collection system, provide adequate capacity to convey flows under existing and future buildout conditions, and comply with the Oregon Department of Environmental Quality (DEQ), Federal and local regulatory standards. The facility improvement program includes capacity improvements within the Glen Oak Road drainage sub-basin (Glen Oak basin) and immediately downstream in the Highway 213 (Hwy 213) trunk sewer collection system to provide adequate capacity for buildout flows and prevent excessive surcharging of gravity sewers that could lead to basement backups. The technical memorandum dated September 9, 2014, by the Applicant's engineer, Keller Associates, finds the SSMP approach, planning criteria, and model data are in line with industry standards and provide a level of assurance that the existing system model and evaluation reflect existing field conditions.

The Applicant's property is located within the Beavercreek Road Concept Plan (BRCP) area. The SSMP recommends flows from BRCP to be conveyed to the sanitary sewer collection system in Beavercreek Road within the Beavercreek Road drainage sub-basin (Beavercreek basin), this includes the proposed Beavercreek Apartments. Within the Beavercreek basin, for adequate sewer facilities sufficient to provide sewer service to the BRCP area, including the proposed Beavercreek Apartments, approximately 3,700 feet of 12-inch and 15-inch gravity sewer pipeline needs to be constructed in Beavercreek Road, extending from the existing system to the Beavercreek Apartments property.

The SSMP also includes an analysis that evaluates the impacts of flows in the Glen Oak basin and Hwy 213 trunk sewers by routing a portion of the BRCP area to the Glen Oak basin. The results predict there are additional impacts to the existing collection system that cause excessive surcharging of gravity sewers that could lead to basement backups. The surcharging impacts from the redirecting of BRCP flows to the Glen Oak basin are in addition to the planned impacts from the Glen Oak basin buildout. The BRCP impacts may be mitigated by upsizing sewers in the existing Glen Oak and Hwy 213 collection system as identified in the SSMP. This upsizing is predicted to provide the needed capacity and eliminate the surcharging of sewers when the proposed future flows are redirected from the BRCP area to the Glen Oak basin.

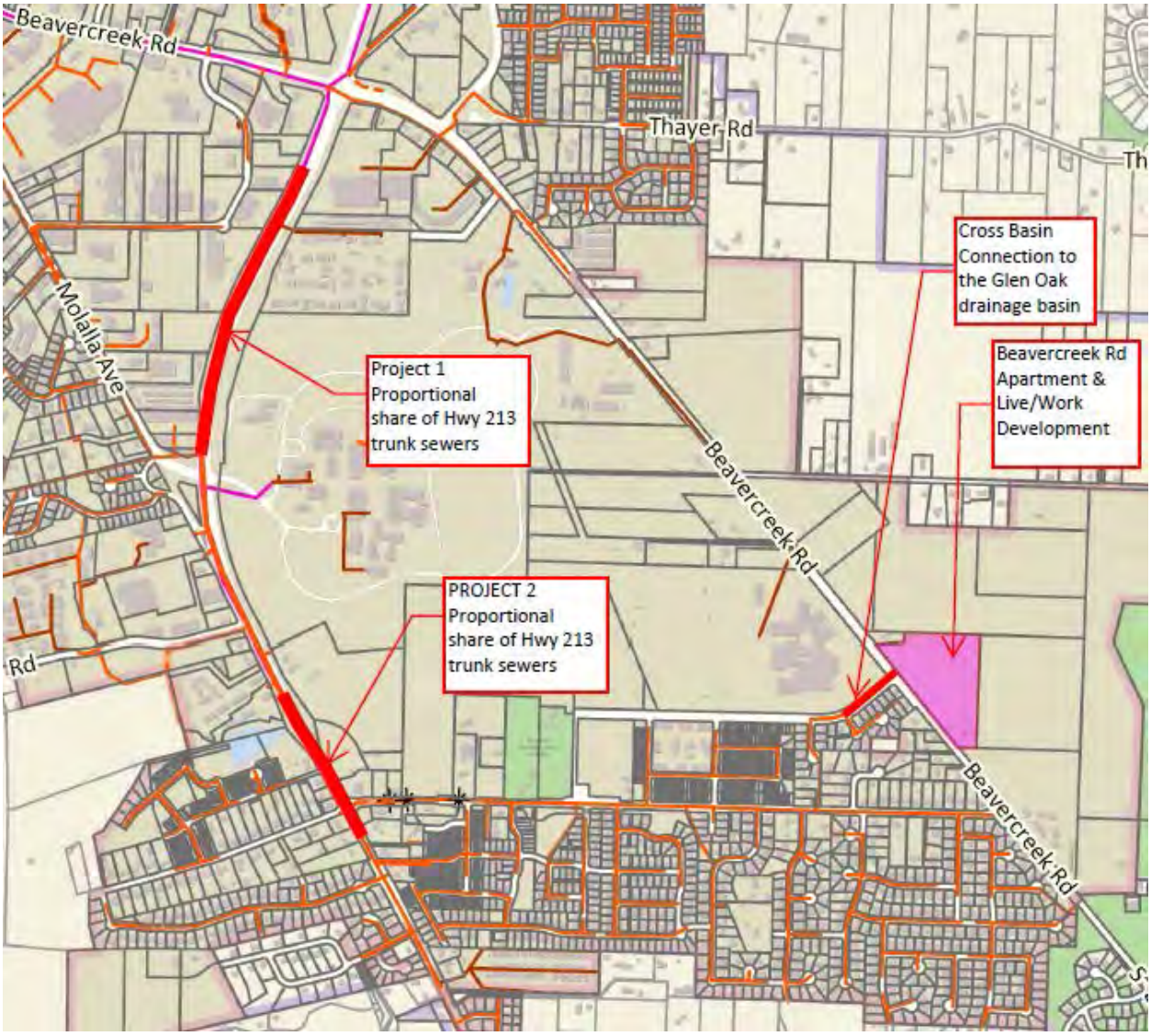
If no BRCP flows are redirected to the Glen Oak basin, then the City does not anticipate constructing upsized gravity sewers in the Glen Oak basin and/or the Hwy 213 trunk sewers, instead the City plans mitigation through an inflow and infiltration (I/I) abatement program that would reduce flows in the collection system to a level that would eliminate the surcharging. The reduction of flows would be facilitated through sewer facility improvements that would be identified as a result of the I/I program.

The Applicant proposed conveying sanitary sewer flows generated by the Beavercreek Apartments development to the Glen Oak basin instead of the Beavercreek basin. This redirecting of flows across basins is expected to result in the redirecting of approximately 421 gpm peak flow from the portion of BRCP

area that may flow by gravity to the Glen Oak basin, and Beavercreek Apartments is approximately 25% of this total peak flow. The SSMP identifies recommended improvements to the existing Glen Oak and Hwy 213 collection system to provide adequate capacity, convey the future BRCP peak flows and eliminate the predicted surcharging from these additional flows. The improvements include upsizing a section of 12-inch pipe to 15-inch pipe and a second section of 21-inch pipe to 24-inch pipe in Hwy 213. The total estimated cost for the capacity improvements is $2,918,000, with BRCP proportional share contribution being $2,180,000 and Beavercreek Apartments peak flows being 25% of BRCP flows for a proportional share contribution of $545,000. This fee-in-lieu, $545,000, is required to provide proportional share funding for capacity improvements that when constructed will eliminate excessive sewer surcharging caused by the predicted peak flows.

Figure 1 shows the locations of the upsizing projects. Project 1 being 2,400 feet of 21-inch pipe to be upsized to 24-inch pipe, and Project 2 being 800 feet of 12-inch pipe to be upsized to 15-inch pipe.

FIGURE 1: Project 1 and Project 2 Location Map



Project 1 capacity improvements result in the elimination of excessive surcharging conditions in upstream sewers in the future buildout conditions. BRCP peak flows of 421 gpm is estimated to be 69% of the buildout peak flows that contribute to the excessive surcharging that requires Project 1 to be constructed. The City anticipates reducing flows through I/I abatement program, although the reduction in I/I is not expected to offset the impacts of the additional BRCP flows, therefore BRCP flows impacts the collection system and contributes to the excessive surcharging conditions that requires Project 1 to be constructed.

Project 2 capacity improvements result in the elimination of excessive surcharging conditions in upstream sewers in the future buildout conditions when the BRCP peak flows of 421 gpm are added to the Glen Oak basin. Project 2 is not required if BRCP flows are not conveyed to the Glen Oak basin. Therefore the BRCP peak flows of 421 gpm is estimated to be 100% of the buildout peak flows causing the excessive surcharging in the collection system that requires Project 2 to be constructed.

Table 1 – Capacity Improvements - Upsizing Pipe Projects

PROJECT #	Length (ft)	Existing Pipe Diameter (inches)	Upsize Pipe Diameter (inches)	Estimated Cost ($)
1	2,400	21	24	$2,381,000
2	800	12	15	$ 537,000
			Total Estimated Cost	$2,918,000

CONCLUSION AND RECOMMENDATION

Staff finds the Condition of Approval No. 37, imposing a fee-in-lieu of $545,000, is not in excess of what is required by code Section 17.62.050 A. 14. Staff finds the fee-in-lieu amount is the needed requirement for the Applicant to provide their proportional cost share of improvements for modification and/or replacement of the existing off-site sanitary sewer system to provide adequate public sanitary sewer facilities for the development proposal. Staff recommends the City Commission deny the Appeal (AP 14-01), uphold the Community Development Director's decision to conditionally approve the applicant's request to construct 121 Apartment Units and 62 Live-Work Units on 9.7 acres on the east side of Beavercreek Road, with no change to the conditions of approval for Condition of Approval No. 37.

EXHIBITS

1. **Public Works File Memorandum** dated November 5, 2014
2. **Keller Associates, Technical Memo** dated September 9, 2014

EXHIBIT 1

OREGON CITY

Public Works

625 Center Street | Oregon City OR 97045
Ph (503) 657-0891 | Fax (503) 657-7892

F I L E M E M O R A N D U M

SUBJECT:	Public Works Engineering SP 14-01 Staff Report Findings and Conditions for Sanitary Sewer and Water Service for Beavercreek Rd Apartments/Live-Work Development
BY:	Aleta Froman-Goodrich, P.E., City Engineer
DATE:	November 5, 2014
PLANNING FILE:	SP 14-01: Site Plan and Design Review

Background:
The staff report for the Type II Limited Land Use Action for SP 14-01 Beavercreek Rd Apartment/Live-Work development is being prepared. This file memorandum provides further details about the Public Works Engineering findings, responses and conditions for the public sanitary sewer and water systems to serve the proposed development. The proposed development, Beavercreek Rd Apartments/Live Work (Beavercreek Rd Apts), is a 121-unit apartments and 62 live-work units on 9.7 acres with MUC-1 zoning located along the eastern side of Beavercreek Road across from the intersection of Meyers Road and Beavercreek Road. The developer is Evergreen Housing Development Group, LLC. The application completeness date was July 11, 2014.

Sanitary Sewer Service:

1. City's 2003 Sanitary Sewer Master Plan (SSMP)
   Findings:
   a. On July 11, 2014, application completeness date, the 2003 SSMP was the City's adopted master planning document for the sanitary sewer collection system standards, improvement requirements, and capacity evaluation.
   b. The 2003 SSMP included evaluation of the existing sanitary sewer collection system to convey flows under existing and future buildout conditions.
      i. Evaluation included collection systems in the Glen Oak and Beavercreek basins.
      ii. The Glen Oak basin conveys flows directly to the City's Highway 213 trunk sewers.
      iii. The Hwy 213 trunk sewers were not evaluated. As a result there is no information about capacity within the Hwy 213 collection system in the 2003 SSMP.
   c. Per the 2003 SSMP, the Beavercreek Road Concept Plan (BRCP) area located north of Glen Oak Rd is planned to be served by the Beavercreek Rd basin from a future sanitary sewer main extension in Beavercreek Rd starting just south of Marjorie Lane to the development.
   d. Beavercreek Rd Apts development is located along Beavercreek Rd north of Glen Oak Rd and within the BRCP area. Per 2003 SSMP, the property is planned to be served by the Beavercreek basin.
      i. 2003 SSMP does not evaluate flows from Beavercreek Rd Apts to be conveyed to the Glen Oak basin.
      ii. 2003 SSMP does evaluate future build-out flows including Beavercreek Rd Apts to be conveyed to the Beavercreek Rd basin.

e. 2003 SSMP identified deficiencies in Glen Oak Rd basin when evaluating the conveyance system for build-out flow conditions, improvements were recommended, and the improvements were constructed and placed into operation.

2. City's 2014 Sanitary Sewer Master Plan (SSMP)
   Findings:
   a. The City Commission adopted the City's 2014 Sanitary Sewer Master Plan (SSMP) on October 1, 2014.
   b. On July 11, 2014, application completeness date, the 2014 SSMP was in the process of being adopted as the City's master planning document for the sanitary sewer collection system standards, improvement requirements, and capacity evaluation.
   c. The 2014 SSMP updates the 2003 SSMP with a current assessment of the City's sanitary sewer collection system to convey existing and future buildout flows, including an evaluation of the Hwy 213 trunk sewers located downstream of the Glen Oak basin.
   d. The 2014 SSMP provides constructive evidence in determining the adequacy of the sanitary sewer service to Beavercreek Rd Apts, including requirements that may apply in order to meet City standards.
   e. The 2014 SSMP included evaluations of the collection systems in the Glen Oak and Beavercreek basins and the downstream Hwy 213 trunk sewers.
      i. The Glen Oak basin conveys flows directly to the City's Highway 213 trunk sewers.
      ii. The Hwy 213 trunk sewers were evaluated for existing and build-out flow conditions, modeling results identified pipe capacity deficiencies in the future build-out conditions, and recommendations for improvements in the Hwy 213 trunk sewers were provided to mitigate for the capacity impacts of future buildout flows. The recommended capacity improvements included upsizing sections of the Hwy 213 trunk sewers from 21" to 24" pipe.
         1. In addition to upsizing Hwy 213 sewers, another recommendation was for the implementation of an Inflow and Infiltration (I/I) Abatement Program in order to reduce the flows upstream of the Hwy 213 trunk sewers. Reducing the upstream flows may minimize and/or eliminate the need to upsize the Hwy 213 sewers.
         2. The City plans to implement an I/I Abatement Program, reduce flows to Hwy 213 trunk sewers to the maximum extent practicable and minimize and/or eliminate the need to upsize the Hwy 213 sewers.
   f. Per the 2014 SSMP, the BRCP area, including Beavercreek Rd Apts, is planned to be served by the Beavercreek Rd basin from a future 15" sanitary sewer main extension in Beavercreek Rd starting just south of Marjorie Lane to the development and continuing south to the south end of Beavercreek Rd. However, although not the preferred approach, *2014 SSMP Appendix I: Glen Oak Road Analysis (Analysis),* does contemplate discharging a portion of the BRCP area flows into the Glen Oak Basin.
      i. *The Analysis* evaluates alternatives for routing some of the future BRCP flows to the Glen Oak basin and provides recommendations for capacity improvements needed to mitigate for the deficiencies in the existing system.
         1. *The Analysis, Routing Alternative C,* showed results of extensive surcharging and potential overflow conditions in the Glen Oak basin and Hwy 213 collection systems when routing approximately 421 gpm of BRCP flows to the Glen Oak basin, including 105gpm of Beavercreek Rd Apts.
         2. The estimated peak flow of 421 gpm is based on the flow expected from BRCP areas that would most likely cross to the Glen Oak basin if developing the

properties prior to the future 15-inch sewer extension being constructed in Beavercreek Rd.

3. To manage the excessive surcharging and potential overflow conditions in the Glen Oak basin and Hwy 213 sewers, modeling results indicate upsizing the City's Hwy 213 sewers is needed. The estimated cost to upsize approximately 1,400 feet of existing 12-inch to 15-inch is $537,000 and 2,400 feet of existing 21-inch to 24-inch is $2,381,000, for a total cost of $2,918,000.

ii. If the BRCP areas identified in *The Analysis, Routing Alternative C,* develop prior to the future 15-inch trunk sewer being constructed in Beavercreek Rd, and convey the estimated peak flow of 421gpm to the Glen Oak basin, then the capacity improvements for upsizing the 12" and 21" Hwy 213 sewers are required.

1. The City will assess each BRCP development proposal for proportional share of Hwy 213 sewer capacity improvements when the BRCP areas identified in *The Analysis, Routing Alternative C* propose to develop prior to the future Beavercreek Rd 15-inch sewer improvements.
2. The total proportional share contribution for said BRCP areas, with a total flow of 421 gpm, is 100% of the 15-inch sewer cost, $537,000, and 69% of the 24-inch sewer cost, $1,643,000, for a total contribution of $2,180,000.
    a. The following should be noted:
        i. Modeling results show upsizing the Hwy 213 sewers from 12-inch to 15-inch is not required when the said BRCP flows are not routed to the Glen Oak basin.
        ii. Modeling results show upsizing the Hwy 213 sewers from 21-inch to 24-inch is required when 613 gpm buildout flows are added to the Hwy 213 trunk sewers. The said BRCP flows are 69% of these buildout flows.
3. Beavercreek Apts, being one of the properties included in the said BRCP areas with a flow of approximately 105 gpm, is approximately 25% of the said BRCP areas total peak flow.
    a. Beavercreek Rd. Apts shall be conditioned to pay a fee-in-lieu for the Hwy 213 sewer improvements.
    b. Fee-in-lieu is based on 25% of BRCP's total proportional share contribution, and 25% of the total contribution is $545,000.

3. Developer's engineer, Keller Associates, submitted a Technical Memo, dated 9/9/2014 that evaluated sewer service to the Beavercreek Rd Apts development.
    a. Keller's Memo:
        i. Memo acknowledges that the 2014 SSMP evaluation of the existing collection system appears to be in line with industry standards and the best long-term approach for servicing the entire Beavercreek service area appears to be a new trunkline sewer along Beavercreek Rd in the Beavercreek basin.
        ii. Memo documents the Beavercreek Apts development estimated peak flow to be 105 gpm.
        iii. Memo includes recommendation to accommodate the Beavercreek Apts development flows in the Glen Oak Rd sewers and direct flows across sewer basins on a short-term basis.
            1. Further comment is made that the Beavercreek Apts could be routed into future Beavercreek Sewer and recommends provisions for this transfer be incorporated into the design of the Beavercreek Apts development.
            2. Note: The development application shows proposed sanitary sewer service to be connected to sewers in the Glen Oak basin.

3. Memo references the City's desire to reserve flows and the resulting available capacity is uncommitted. *City Comment:: This comment is inaccurate as the City through the adoption of the 2014 SSMP has committed the existing remaining capacity of the Glen Oak collection system for the planned developments that must flow to the Glen Oak basin and Hwy 213 sewers.*

iv. Memo includes recommendation to bolt down and seal manholes with only two feet of cover. *City Comment: The City manages excessive surcharging of pipes through upsizing the pipe to increase the capacity and/or reducing the flow to the sewer through I/I abatement or other flow reduction measure. Bolting down the manholes does not resolve the capacity deficiencies of the sewer pipes.*

v. Memo includes comments about the BRCP areas being routed to the Glen Oak Rd basin long-term and completing downstream improvement in Hwy 213 to alleviate surcharged conditions in the City's Glen Oak Rd sewers.

vi. Memo includes comments about inflow and infiltration I/I and reducing the amount of I/I to free up pipe capacity for development.
   1. Memo also includes comments about Keller's investigation about benchmarks for estimating typical cost per gallon for I/I removed from collection systems.
   2. Keller found local agencies have no quantifiable method to calculate the I/I reduction and cost per gallon.
   3. Keller found there is a methodology that is being used by municipalities that calculates a cost to offset I/I.

vii. Memo includes three sections titled: "Background", "General Observations", and "Available Capacity in the Glen Oak Sewer Line".

viii. Memo does not include a section for recommendations and/or conclusions.

b. PW Engr Staff Findings in reference to Keller's Technical Memo:

i. Memo does not include a section for specific recommendations and/or conclusions so staff reviewed the content of the Memo and made interpretation of the intent for the statements that were presented.

ii. There is no reliable methodology that quantifies the amount of I/I reduction that would result from an I/I Abatement Program. Therefore, there is no reliable method to calculate the cost per gallon of I/I removed from the sewer system until the I/I is physically removed and measured through flow monitoring before and after the abatement improvements are implemented.

iii. Routing flows from the BRCP areas, including Beavercreek Apts, to the Glen Oak Rd utilizes capacity in the Glen Oak Rd basin and Hwy 213 collection systems that was planned for the future buildout of the Glen Oak basin and Hwy 213. The BRCP flows were planned for the Beavercreek Rd basin.

iv. *The 2014 SSMP Analysis Routing Alternative C* identifies improvements to the Hwy 213 sewers to mitigate for the capacity impacts related to the BRCP areas' additional flows.
   1. If development occurs in the said BRCP areas prior to the future 15-inch sewer extension in Beavercreek Rd and development flows are directed across basins to the Glen Oak basin, then the Hwy 213 sewer capacity improvements are required to manage the surcharging and potential overflow conditions.
   2. Beavercreek Rd Apt is one of the properties in the said BRCP areas and is the first development proposing to cross basins.
   3. The total estimated additional peak flows from said BRCP areas is 421 gpm and Beavercreek Apts flow is approximately 25% of this flow, 105 gpm.

v. The City plans to start an I/I abatement program in 2015/2016 for the Basins that contribute to Hwy 213 sewers and it is unknown at this time whether there will be a reduction in I/I through this proposed program.

vi. To allow the said BRCP areas, including Beavercreek Rd Apts, to cross basins and direct flows to the Glen Oak basin, the Hwy 213 sewer capacity improvements are required to mitigate for the additional flows that will contribute to excessive surcharging within the Glen Oak and Hwy 213 collection systems.

1. These improvements are identified in *2014 SSMP, Appendix I: Glen Oak Road Analysis, Figure C-5, Routing Alternative C* and includes: upsizing the City's Hwy 213 sewers and estimated costs, approximately 1,400 feet of existing 12-inch to 15-inch is $537,000 and 2,400 feet of existing 21-inch to 24-inch is $2,381,000, for a total cost of $2,918,000.
2. The proportional share of cost for the said BRCP areas with a total flow of 421 gpm, is 100% of the 15-inch sewer cost, $537,000, and 69% of the 24-inch sewer cost, $1,643,000, for a total contribution of $2,180,000.
3. The proportional share of cost for the Beavercreek Apts, being one of the properties in said BRCP areas, with a total flow of 105 gpm is 25% of BRCP's total proportional share contribution, and 25% of the total contribution is $545,000.

vii. Requirements for connection to the City's existing Glen Oak system and sewer improvements for service extensions:

1. Connection to the existing Glen Oak system shall be located in the public road right-of-way, Meyers Road, at the existing manhole at Meyers Rd and Emerson Ct.
2. The design of the new 8-inch connecting sewer shall incorporate the design of the future 15-inch sanitary sewer so in the future the Beavercreek Apts can be transferred to the Beavercreek basin through a connection from the new 8-inch to the future 15-inch sewer.
3. The new 8-inch sewer shall extend south of the Meyers/Beavercreek intersection in Beavercreek Rd along the frontage of the site with service laterals to serve the proposed buildings with frontage on Beavercreek Rd.
4. The new 8-inch sewer shall not extend north of the Meyers/Beavercreek intersection at this time due to direction of flow to the Glen Oak basin so fee-in-lieu shall be required. Fee-in-lieu for 8-inch sewer along site frontage in Beavercreek Rd from Meyers/Beavercreek intersection to northerly boundary of development. Fee-in-lieu shall include all costs for design, construction and contingencies for a City public agency construction contract for the 8-inch extension.
5. At this time a 15-inch pipe in Beavercreek Rd shall not be required due to the anticipated potential for maintenance and operational problems of having a 15-inch pipe with very little flow contribution, and the future 15-inch connection will most likely not be made within the next 10 years.

c. Conditions of Approval recommended for sewer service to proposed SP 14-01 Beavercreek Apartment Development:

i. To direct flows across sewer basins to the Glen Oak basin:

1. Applicant shall be conditioned to pay a fee-in-lieu for the Hwy 213 sewer improvements based on its proportional share contribution to the additional line capacity.
    a. Beavercreek Apts additional flow is 25% of the BRCP areas total flow.
    b. The proportional share contribution for the Beavercreek Apts, being one of the properties in said BRCP areas, with a total flow of 105 gpm is 25% of

BRCP's total proportional share contribution, and 25% of the total contribution is $545,000.

c. The 2014 SSMP provides the data and information for the basis of the fee-in-lieu costs.

ii. Connection location of proposed sanitary sewer to the existing sewer in the Glen Oak basin:
   1. Applicant shall design 8" sanitary sewer collection system in existing and future public roads with the connection to the existing sanitary sewer system at the manhole located in Meyers Road at Emerson Ct.
   2. Applicant shall refer to the City's standards for typical utility placement within the public street section for location of underground public utilities.
   3. Applicant shall extend the new 8-inch sewer pipe in Meyers Rd to Beavercreek Rd with a crossing of Beavercreek Rd to the future public road system and extend the new 8-inch sewer pipe in Beavercreek Rd to the south across the frontage of the property to serve the proposed buildings fronting Beavercreek Rd.
   4. Beavercreek Apt design shall make consideration of the future Beavercreek Rd 15-inch sewer extension for future and incorporate into the design the future transferring of the new 8-inch to the future 15-inch.

iii. Sanitary Sewer improvements along frontage of development in Beavercreek Road.
   1. Applicant shall pay fee-in-lieu for 8-inch sanitary sewer along the site frontage north of the Meyers/Beavercreek intersection to the northerly site boundary of development for the future Beavercreek Rd sanitary sewer extension.
   2. Fee-in-lieu for 8-inch sewer along frontage shall be based on all costs for design, construction and contingencies for a City public agency construction contract.
   3. Applicant shall provide an engineer's estimate, signed and stamped by the engineer, for the City's review and approval.

iv. There may be other conditions of approval for consideration and still to be determined.

Water:

1. City's 2012 Water Master Plan
   Findings:
   a. Beavercreek Apts development is located in the Beavercreek Rd Concept Plan (BRCP) area.
   b. Beavercreek Apts development has ground elevations of 480 feet and greater.
   c. BRCP area with ground elevations of 480 feet and greater are planned to be served by the future expanded Fairway Downs pressure zone. The future expanded Fairway Downs pressure zone requires the construction of future water facilities that include a storage reservoir and pump station prior to providing water service to the BRCP area with properties that have ground elevations of 480 feet and greater.
   d. Future 12-inch waterline is recommended in Beavercreek Rd from Glen Oak Road to Meyers Road to serve the BRCP area and a future 12-inch waterline extending into the BRCP area where ground elevations are 480 feet and greater.
2. Beavercreek Apts development proposed water service
   Findings:
   a. Beavercreek Apts development wants to develop prior to the expansion of the Fairway Downs pressure zone and construction of the future water facilities planned to serve the BRCP area.
   b. Clackamas River Water (CRW), the City and Developer have found an interim solution for water service prior to the City's Fairway Down pressure zone expansion and construction of the future facilities needed to serve the BRCP area.
   c. CRW Commissioners met on 9/22/2014 and approved to proceed with the following interim plan with reference to water service to Beavercreek Apts:

i. 800 feet of 12-inch waterline and master meter paid for by developer
ii. CRW own master meter
iii. City own 12-inch waterline.
iv. An Intergovernmental Agreement between CRW and the City providing the terms and conditions of water service

3. Conditions of Approval recommended for Water service to proposed SP 14-01 Beavercreek Apts development:
    a. New water system shall be designed with minimum 12-inch pipe in Beavercreek Road from Glen Oak Rd to Meyers Rd and to be owned by the City, with minimum 8-inch water mains throughout the site, and connection to a new master meter and vault to be owned by Clackamas River Water located at approximately Glen Oak Rd and Beavercreek Rd.
    b. Applicant shall design looping of the new water system and avoid dead-end mains to the maximum extent practicable.
    c. Applicant shall design water system in existing and future public roads to the maximum extent practicable minimizing the need for public waterline easements.
    d. Prior to submitting construction plans to the City, an Intergovernmental Agreement (IGA) between Clackamas River Water (CRW) and the City must be executed. IGA shall include the terms and provisions needed for water service to the development through a proposed master meter to be owned by CRW and 12-inch waterline in Beavercreek Rd to be owned by the City.
    e. Prior to construction plan approval and after execution of the proposed IGA, the Applicant shall receive CRW's written approval of design, plans and specifications for water facilities as agreed upon through the IGA.
    f. Note: There may be other conditions of approval for consideration and still to be determined.

EXHIBIT 2

KELLER associates

Technical Memo

REGISTERED PROFESSIONAL ENGINEER 73454PE OREGON JULY 15, 2003 JAMES BLEDSOE

EXPIRATION DATE: 12-31-15

TO: Andrew Brand, Director of Development
Evergreen Housing Development Group, LLC

FROM: James Bledsoe, PE

DATE: September 9, 2014

SUBJECT: Sewer Service to the Beavercreek Development

Background

The proposed Beavercreek Apartment Development is located east of S. Beavercreek Road in Oregon City, Oregon. The City's Draft Sanitary Sewer Master Plan (May 20, 2014) shows this area being serviced by a new sanitary sewer trunkline to be located in S. Beavercreek Road. A subsequent evaluation of a portion of the Beavercreek Road basin (identified as Areas 1 and 2 in Figure 1 below) was subsequently completed by Brown and Caldwell (BC). The build-out impacts on the Glen Oak Road sewer for Areas 1 and 2 was summarized by BC in a technical memorandum dated June 30, 2014. The proposed Beavercreek Apartment Development encompasses approximately 11 acres and is located within Area 1.

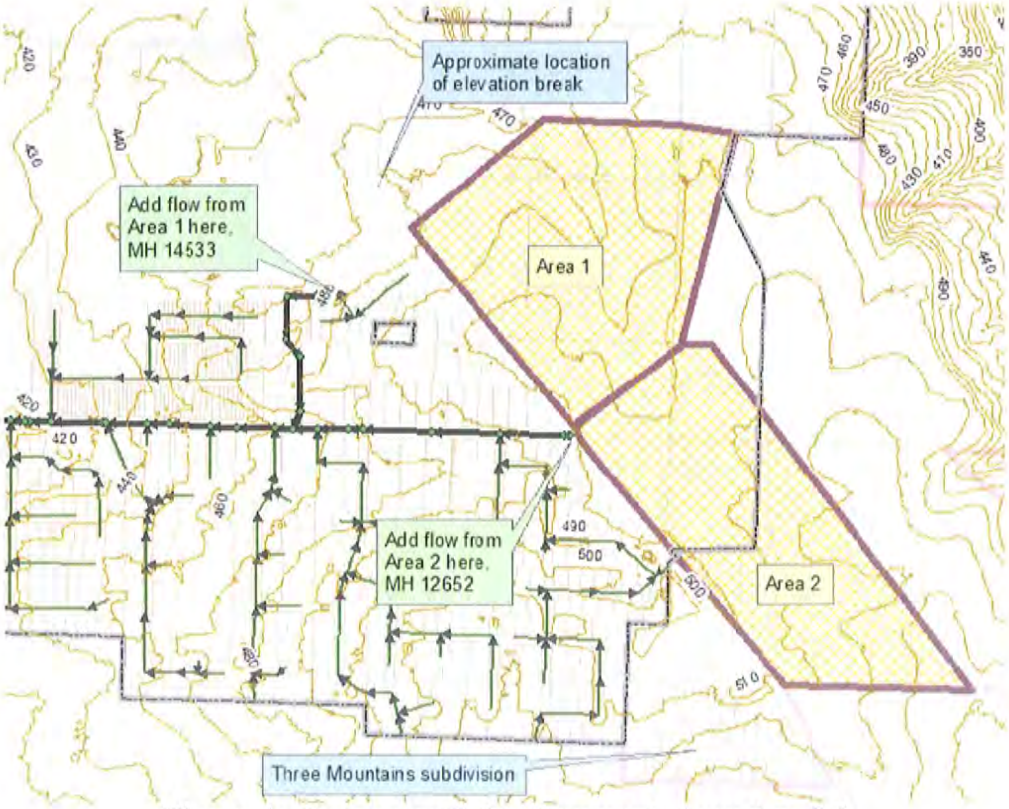


Figure 1: Beavercreek Development, Area 1 and 2
(from Brown and Caldwell June 30, 2014 Technical Memorandum)

EXHIBIT 2

Keller Associates was contracted by Evergreen Housing Development Group, LLC to evaluate the availability of sewer service in the existing Glen Oak Road Sewer for the Beavercreek Development. This effort involved a review of Oregon City's Draft Sanitary Sewer Master Plan and subsequent technical memorandum prepared by BC. Brown and Caldwell also provided a letter on August 8, 2014 to address specific comments and questions Keller Associates had relative to the master plan and technical memorandum. This technical memorandum presents our findings.

General Observations

The approach taken by BC in evaluating the existing collection system appears to be in line with industry standards. Planning criteria, including peaking factors, design storm events, future flow assumptions, and infiltration and inflow (I/I) assumptions also appear to be in line with industry standards, customized to the unique local conditions of the region. Flow data gathered throughout the system (including one location downstream of the Glen Oak Road sewer line) also provide a level of assurance that the existing model and evaluation reflect existing field conditions.

The estimated combined build-out flow from the Beavercreek Areas 1 and 2 was calculated by BC to be approximately 421 gpm, which is more than the available capacity in the Glen Oak Road sewer. Keller Associates does not object with BC findings that the best *long-term* approach for servicing the entire Beavercreek service area appears to be a new sewer trunkline along S. Beavercreek Road. This service approach ultimately directs available capacity in the Glen Oak Road Sewer and the downstream pipeline in HWY 213 for undeveloped areas adjacent to these pipelines, while providing for build-out of both the Beavercreek and Glen Oak service areas.

Flow projections prepared by Evergreen Housing Development's project engineer, PACE Engineering, estimate a total flow of approximately 105 gpm for the Beavercreek Apartment Development. These projections were developed using similar assumptions to those used by BC in estimating flow projections for this sewer basin (80 gpcd, 2.5 people per household, and I/I rates similar to the existing developments). Refer to Attachment A for a copy of PACE engineering calculations. With improved construction materials and installation techniques, it is anticipated that substantially less I/I will be present in the development lines and that actual flows will be less than reported.

It should also be noted that constructing the Beavercreek Sewer Trunkline to service only the Beavercreek Apartment Development could introduce other operation and maintenance challenges until such time as increased flows provided sufficient scouring velocities in the new sewer line.

Available Capacity in the Glen Oak Sewer Line

While construction of the S. Beavercreek Road pipeline may be the best long-term solution for serving the Beavercreek area, there is available capacity in the Glen Oak Road sewer for new development. Brown and Caldwell reported an **estimated remaining capacity of approximately 225 gpm** in the downstream Hwy 213 and Glen Oak Road conveyance system, assuming full pipe conditions and existing peak flow conditions (10-year evaluation event). Surcharged conditions were not considered in estimating the existing remaining capacity, presumably because of the minimal cover above the pipe (only two feet) near the

location where the Glen Oak Road sewer discharges into the Hwy 213 sewer (nodes 12371 and 12372). Regardless of the source of additional flows in the Glen Oak Road sewer, Keller Associates recommends that the manholes with only two feet of cover be equipped with bolted down, sealed manholes if these are currently not in place.

The City desires to reserve approximately 20 gpm of the available 225 gpm capacity for the existing Three Mountains subdivision (currently on septic systems). This would leave approximately 205 gpm of uncommitted capacity that could be used to service a portion of Areas 1 and 2 of the Beavercreek Development. **Allowing the proposed Beavercreek Apartment Development to gravity flow to Glen Oak Road would still leave approximately 100+ gpm of uncommitted capacity for future downstream development.**

While accommodating the Beavercreek Apartment Development in the Glen Oak Road sewer would direct flows across sewer basins on a short-term basis, it is worth noting that the area can gravity flow to the Glen Oak Road sewer system. Additionally, in the short-term there may be operational benefits to the City to direct flow into the Glen Oak Road sewer. Allowing flow from Beavercreek Development to go to the Glen Oak Road sewer would also allow the large capital expenditures of the Beavercreek Sewer Trunkline project to be delayed without exceeding the capacity of the existing pipelines, giving the City and development community more time to plan for and fund the new trunkline. Flow from the Beavercreek Development could eventually be routed into the Beavercreek Sewer Trunkline, and provisions for this transfer should be incorporated into the design of the Beavercreek Development.

Accommodating the Beavercreek Apartment Development in the Glen Oak Road sewer does not obligate the City to service other future developments in Areas 1 and 2 within the Glen Oak Road sewer. Should Areas 1 and 2 be committed long-term to the Glen Oak Road sewer, then as an alternative to the Beavercreek Sewer Trunkline, it may be possible to complete downstream improvements in Hwy 213 to alleviate surcharged conditions in the City's Glen Oak Road sewer. In their June 30, 2014 technical memorandum, BC estimated that a $537,000 pipe upsizing project in Hwy 213 would alleviate the surcharged conditions in the City-owned Glen Oak Road sewer.

One of the concerns expressed by the City in allowing Beavercreek Apartment Development to discharge into the Glen Oak Road sewer is that the flow utilizes available downstream capacity in HWY 219 that could be dedicated to other developments. The City also recognizes that significant contributions of I/I utilize available pipe capacity. Reducing the amount of I/I could free up pipe capacity for development. The cost to reduce flow by reducing I/I is a function of a number of factors, including the presence of direct storm water connections, topography, climate, groundwater levels, soil conditions, and pipe material conditions.

Keller Associates investigated whether there are benchmarks for estimating typical cost per gallon for I/I removed from a wastewater collection system. Contact was made with the City of Eugene, City of Springfield, City of Salem, City of Portland, and Clean Water Services. All of these entities desire to obtain this information, but do not have it at the present time. Clean Water Services reported that they have done similar research on the

topic and were also not able to obtain results in the Western United States. Some of the best available data comes from Massachusetts where there are several regional systems that assess development a fee to allow the development to occur. The cost charged to offset I/I is derived from a mix of technical and political discussions. Many municipalities use a factor referred to as an offset ratio which is multiplied by what they anticipate the actual cost. For example, if there is an offset ratio of 1.25 to 1, a developer would pay 125% the actual anticipated cost to remove the I/I. Depending on the municipality, this fee would be assessed the developer based on either average or peak anticipated flows from the development. Using the available data we were able to find, the average cost to remove I/I was about $5/gallon/day based on average daily flows. Obviously, if a large point source of I/I can be identified, the cost to reduce could be much lower. Likewise, a community with a history of aggressive I/I reduction efforts may find that the incremental cost to further reduce I/I could be much higher.

EXHIBIT 2

Attachment A

MEMORANDUM

Date: August 27, 2014

To: Dave Poulson,PE, Branch Manager, PACE Engineers, Inc.

From: Bill Pavlich, PE, PACE Engineers, Inc.

Subject: **Oregon City Live/Work – Sewer Flow Computation**
PACE Project No. 13869

Methodology

The methodology used for this sewer flow analysis is largely based on data and approaches utilized in the City's recent *Draft Sewer System Master Plan* (D-SSMP) and *Draft Technical Memo* March 3, 2014 (D-TM)prepared by Brown and Caldwell. Plans for the proposed development have been sufficiently developed so as to determine specific sewer main sizes and lengths and the number of housing units; consequently, the calculations are based on the specific characteristics where possible rather than general planning, per-acre allowances.

Oregon City Live/Work - Sewer Related Design Characteristics

- 1,794 lineal feet of 8-inch gravity sewer main tributary to the Glen Oaks subbasin.
- 180 dwelling units (du) (*147 apartments, 33 townhomes*).

Analysis Parameters

The following analysis parameters and approaches are based on information obtained or derived from the D-SSMP and D-TM.

- Persons per household (pph) = 2.5
- Average daily sewer contribution = 80 gallons per capita day (gpcd). *(Note this is an older per capita standard; newer standards are typically lower.)*
- Peak Factor = 3.6 (*This is conservatively estimated from Table 11 (p. A19, D-SSMP) the entry ("Main Street") used for a comparable size of development in terms of acreage and population).*
- Peak I/I = 8,144 gallons per inch of pipe diameter per mile per day (gpimd). *(This is the figure determined for the Glen Oaks subbasin in Table ES-5 (p. xiv, D-SSMP) and represents a very conservative estimate of future I/I in the Oregon City Live/Work development. Note typical design standards (such as the Ten State Standards) allow only 100 gpimd when testing new construction.)*

PACE

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EXHIBIT 2

Calculations

Domestic wastewater average daily flow:

180 du x 2.5 pph x 80 gpcd = 36,000 gpd (25 gpm)

Peak domestic wastewater flow:

36,000 gpd x 3.6 = 129,600 gpd (90 gpm)

Peak I/I:

8,144 gpimd x 8 in x (1,794 LF/ 5,280) = 22,137 gpd (15.4 gpm)

Combined peak domestic and I/I flow:

129,600 gpd (domestic) + 22,137 gpd (I/I) = 151,737 gpd (105.4 gpm)

Impacts

The D-TM showed flow attenuation (diminishing of the peak flow) occurring at a few locations downstream of the connection (manhole #12652) with the proposed development (see Table 3, D-TM). Flow attenuation resulted in flows that were approximately 98% of the peak at manhole # 12370, and 83% of the peak at manhole # 11776 for Alternative B. Assuming a similar attenuation to occur for the 105.4 gpm calculated above would result in the following peak flows as the flow passes through each of the noted manholes:

MH-12652	100.0%	105.4 gpm
MH-12903	99.3%	104.7 gpm
MH-12370	98.3%	103.6 gpm
MH-11776	83.2%	87.7 gpm

The attenuation percentages above were based on routing 285 gpm (D-TM); for 105.4 gpm the attenuation percentages are likely lower, but without modelling it is not possible to more accurately determine the attenuation in the system.

Actual peak flows from the proposed development are likely to be lower than the calculated 105.4 gpm. The nature of the development (apartments and townhouses) will likely have an average occupancy lower than the 2.5 pph used above. Modern fixtures and appliances are much more water efficient: typical interior water usage for such dwellings is 51.9 gpcd (source: Metcalf & Eddy, Wastewater Engineering: Treatment and Reuse, 2003) – considerably lower than the 80 gpcd noted above. Initial I/I should be nominal assuming quality engineering and construction. We understand the need to be conservative in planning and design; however, these consideration suggest real world impacts considerably less than 105.4 gpm.