



**Planning & Community Dev.**

117 N Molalla Avenue

PO Box 248

Molalla, Oregon 97038

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[communityplanner@cityofmolalla.com](mailto:communityplanner@cityofmolalla.com)

## AGENDA

Molalla Planning Commission

6:30 PM, August 15, 2018

Meeting Location: Molalla Adult Center

315 Kennel Avenue.

Molalla, OR 97038

The Planning Commission Meeting will begin at 6:30pm. The Planning Commission has adopted Public Participation Rules. Copies of these rules and public comment cards are available at the entry desk. Public comment cards must be turned in prior to the start of the Commission meeting. The City will endeavor to provide a qualified bilingual interpreter, at no cost, if requested at least 48 hours prior to the meeting. To obtain services call the City Recorder at (503) 829-6855.

I. CALL TO ORDER

II. Flag salute and Roll Call

III. Public Comment – Limited to 3 minutes per person

IV. MINUTES:

- July 25, 2018 Minutes

V. Public Hearing for a Proposed Comprehensive Plan Amendment:

- P86-2018 – Waste Water Facility & Collection System Master Plan Update

Decision: \_\_\_\_\_

VI. DISCUSSION ITEM:

- Important summer meeting dates

VII. REPORTS AND ANNOUNCEMENTS

- none

VIII. ADJOURNMENT

**Minutes of the Molalla Planning Commission Regular Meeting**  
**City Hall**  
**117 N. Ave, Molalla, OR 97038**  
**Wednesday, July 25, 2018**

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- 1) **CALL TO ORDER OF THE MOLALLA PLANNING COMMISSION MEETING;** the regular meeting of July 25, 2018 was called to order by Chair Rae Lynn Botsford.

**ATTENDANCE:**

Chair Rae Lynn Botsford - Present  
Co-Chair Omar Reynaga - Absent  
Commissioner Debbie Lumb – Present  
Commissioner Jennifer Satter – Present  
Commissioner Doug Eaglebear – Present  
Commissioner Hardeep Singh Brar- Present

**STAFF IN ATTENDANCE:**

Dan Huff, City Manager - Absent  
Gerald Fisher, Public Works Director – Absent  
Aldo Rodriguez, Community Planner – Present  
Spencer Parsons, City Attorney - Absent

2) **MINUTES:**

- Chair Botsford confirmed all members received and reviewed minutes from June 6, 2018. Chair Botsford called for any amendments, PC Satter motions to approve with correction of her name from “Statter” to “Satter”. PC Eaglebear made a motion to accept the minutes from June 6 with correction of Satter’s name, PC Singh Brah seconded. Motion carried (5-0), all ayes.

3) **COMMUNICATIONS, PRESENTATIONS, and PUBLIC COMMENT**

- No public comment

4) **PUBLIC HEARING FOR LEGESLATIVE PROPOSAL, COMPREHENSIVE PLAN AMENDMENT & ZONE CHANGE**

P67-2018

- Chair Botsford reviews protocol for public comment and begins asking the PC the standard screening questions. All are no’s until:
  - “Do any members wish to disclose any facts which might create the appearance of a conflict or are otherwise unable to participate in the hearing in a fair and objective manner?” PC Satter: “I would, some of the properties are school district properties and I am on the board for the school district...as well as Ace Lumber which is a client of the law firm I work for.”
  - Chair Botsford asks for any objections to PC Satter’s involvement in the meeting. All no’s.
  - Chair Botsford asks if there are any audience members who object to and PC members participating in the meeting. No.

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- Chair Botsford opens file for P67-2017, application for a comprehensive plan zone change. Asks if any PC has received a request for party status. No. Asks if anyone in audience requests party status. No. Asks for staff to present summary of staff report.
- CP Rodriguez presents staff report:
  - States need to bring zoning map up to date with comprehensive plan because it presents administrative hurdles and confusion for developers. Uses Toliver Estates as an example of incorrect past zoning with regards to the comprehensive plan.
  - CP Rodriguez presents Review Criteria:
    1. Planning Commission recommends, and City Council approves.
    2. Proposal must be consistent with relevant statewide planning goals.
    3. Proposal must be consistent with Molalla comprehensive plan.
    4. Comprehensive plan may be amended concurrently with proposed changes in zoning.
    5. Proposal must be in the public interest or correct past inconsistencies.
    6. Amendment must confirm with section 17-4.6.050
  - Report summarizes how the proposal is consistent with statewide planning goals 1,9,10 and 14 and is consistent with exiting comprehensive plan to correct past inconsistencies in zoning. CP Rodriguez overviews trip generation notices sent to ODOT and their comments as well as comments from the Sutter family to be added to the conditions for approval.
  - CP Rodriguez asks for questions: No.
- Chair Botsford opens up public comment:
  - Steve Dellar, Sunrise Acres Resident: Concerns about changing the zoning of a single-family neighborhood and that it will change the character, culture and housing type that is already established. Does not want developers to come and make duplexes in in-fill areas and believes the infrastructure won't be able to keep up. Cites article from Montana State student about zone changes lowering property values.
  - Jody Newland, 321 Chinook St: Reiterates Steve's comments – believes duplex's will come in and change neighborhood dynamics. Also states that the maps sent out to her address were wrong.
  - Cecelia Maybin: Concerns about "Virginia Hickong Property" (her mother's) across from Safeway. At time of mother's death was zoned residential but surrounded by commercial. Does not know what it is being proposed to change to.
    - Chair Botsford: Explains that it is currently heavy industrial and is not being considered for a change. Asks now if any of the PC has questions for the public speakers. No.
    - CP Rodriguez: Clarifies that the zoning change for sunrise acres, R1 to R2, still allows for the same uses, duplex or single family, just the lot size requirements and number of residents per lot changes. Duplex houses could be made in R1 or R2. Does not foresee any new development in this built out neighborhood. Reiterates to public and Steve Dellar that the comprehensive

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- plan is the path the city is supposed to follow and the changes will not affect current neighborhood dynamics.
- Back and forth discussion ensues between Steve, Jody, Aldo, Botsford and Satter about the possibility of the area being developed, whether duplex's will come in or not, whether the comprehensive plan zoned things correctly, and whether or not the comprehensive plan is actually in the towns best interest.
- Chair Botsford closes hearing so PC can discuss.
  - Chair Botsford opens discussion on the topic of changing old infrastructure to medium density and new infrastructure to low density and why each is changing. Has concerns about losing the small town feel of Molalla with higher density development.
  - PC Eaglebear wants clarification on what constitutes each zone. CP Rodriguez wants to follow comprehensive plan, PC Satter opens up possibility of changing the comprehensive plan to match the zoning map instead.
  - CP Rodriguez states that they are only trying to change the comprehensive plan to meet the current use.
  - PC decides to do some research and see which zoning designation fits Sunrise Acres (14) and Toliver Estates best to determine which residential density fits the use best. They will recommend to City Council after this research.
- Recommendations to City Council for P67-2017:
  - Look at the use of #14, if the use is determined to be R1, change the comprehensive plan, if use is determined to be R2, change zoning map.
  - #26, remain general commercial and change the comprehensive plan.
  - #22, City Hall, re-designate as public/semi-public.
  - Parcel excluded on #28 shall be included and zoned public/semi-public.
- PC Satter makes motion and PC Eaglebear seconds. Motion approved 5-0.
- Chair Botsford closes public hearing on P67-2017.

## 5) DISCUSSION ITEM

- Planning Commission upcoming meeting dates
- Community Planner, Aldo Rodriguez – reminds the planning commission the importance of attending the planning commission meetings. Community Planner, Aldo Rodriguez – reviews important dates this summer that the planning commission must attend.

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**6) REPORTS AND ANNOUNCEMENTS:**

- CP Rodriguez introduces summer intern Austin Barnes to PC.

**7) ADJOURN**

Motion to adjourn made by PC Satter. PC Lumb seconded. Motion carried (5-0), all ayes.

\_\_\_\_\_  
Chair, Rae Lynn Botsford

\_\_\_\_\_  
Date

ATTEST:

\_\_\_\_\_  
Aldo Rodriguez  
Community Planner



City of Molalla  
Community & Regional Planning  
117 N. Molalla Ave.  
Molalla, OR 97038

## STAFF REPORT P86-2018

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PROCEDURE TYPE IV

LAND USE DISTRICT:  
CITY WIDE

PROPERTY DESCRIPTION:  
CITY WIDE

APPLICANT:

CITY OF MOLALLA

117 N MOLALLA AVE.

MOLALLA OR 97038

CONTACT PERSON:

ALDO RODRIGUEZ (503) 759-0219

EMAIL: ARODIRGUEZ@CITYOFMOLALLA.COM

**PROPOSED DEVELOPMENT ACTION:** Adoption of a Waste Water Facility & Collection System Master Plan Update as a support document to the Comprehensive Plan. The Waste Water Facility & Collection System Mast Plan presents findings and recommendations relating to the City of Molalla Wastewater Facility & Collection system. The plan determines the current state of the Waste Water Facility & Collection system and plans for future needs. The primary objectives of this Waste Water Facility & Collection Master Plan are: 1) Establish Waste Water Facility & Collection system design and planning criteria, 2) Evaluate the existing collection system capacity using smoking testing and flow poking methods, 3) Summarize existing system deficiencies and propose improvements to enhance system serviceability, 4) Recommend improvements needed to service future growth, and 5) Develop a capital improvement plan and an appropriate system implementation strategy.

DATE: AUGUST 8, 2018

Attachments      A. Review Criteria  
                          B. Staff Report

## ATTACHMENT A: REVIEW CRITERIA

**REVIEW CRITERIA:** Amendments to the Comprehensive Plan will be approved if the Council finds that the applicant has shown that the following applicable criteria are met, the applicant shall bear the burden of proof:

1. If the proposal involves an amendment to the Comprehensive Plan, the amendment must be consistent with the Statewide Planning Goals and relevant Oregon Administrative Rules;
2. The proposal must be consistent with the Comprehensive Plan (the Comprehensive Plan may be amended concurrently with proposed changes in zoning);
3. The City Council must find the proposal to be in the public interest with regard to community conditions; the proposal either responds to changes in the community, or it corrects a mistake or inconsistency in the subject plan or code; and
4. The amendment must conform to Section 17-4.6.050 Transportation Planning Rule Compliance. (Ord. 2017-08 §1)

## **ATTACHMENT B: STAFF REPORT, P86-2018**

### **FINDINGS OF FACT**

#### **A. Background Information:**

On August 9, 2017 Project Delivery Group, Dyer Partnership had a contract awarded for the Wastewater Facility and Collection System Master Plan (WWFCSMP) to provide consulting services to prepare a comprehensive WWFCSMP for the City of Molalla.

Over the course of the last year, Project Delivery Group, Dyer Partnership has developed a draft WWFCSMP in conjunction with input from City staff and a Technical Advisory Committee (TAC) and Project Advisory Committee (PAC). The master plan used smoke testing and “Flow Poking” equipment as a planning tool, which was used to identify potential improvements and address existing deficiencies. The master plan developed a capital improvement plan that lists each project, includes an opinion of probable costs, along with an order of priority. The total estimated cost for all proposed improvements is 37.22 million dollars over the next 20 years.

#### **B. Molalla Waster Water Facility & Collection System Master Plan Summary:**

The Master Plan evaluated population, development densities, land use and other factors that affect the waste water system. Prior to this study much of the waste water system was unmapped. Because an accurate base map is necessary to evaluate the existing system and create a master plan, a significant effort was put into mapping the existing waste water system. Data on the existing system was obtained from a combination of record drawings, site visits, and field testing. The plan then makes recommendations for improvements and repairs to the Waste Water Facility & Collection System.



### **C. Review Criteria:**

1. *If the proposal involves an amendment to the Comprehensive Plan, the amendment must be consistent with the State-wide Planning Goals and relevant Oregon Administrative Rules;*

**Findings: Relevant Statewide Planning Goals are:**

- **Goal 1: Citizen Participation;**
- **Goal 6: Air, Water and Land Resources Quality**
- **Goal 11: Public Facilities and Services;**
- **Goal 14: Urbanization.**

Statewide Planning Goal Findings are included in this Staff Report under Statewide Planning Goal Findings and discussed in the context of their implementation in the adopted Molalla Comprehensive Plan.

2. *The proposal must be consistent with the Comprehensive Plan (the Comprehensive Plan may be amended concurrently with proposed changes in zoning);*

**Findings: Molalla Comprehensive Plan Goals 1, 6, 11, and 14 are discussed under Statewide Planning Goal Findings.**

3. *The City Council must find the proposal to be in the public interest with regard to community conditions; the proposal either responds to changes in the community, or it corrects a mistake or inconsistency in the subject plan or code; and*

**Findings of Fact:**

The current WWFCSMP element of the Comprehensive Plan was adopted in 2000. City of Molalla has experienced a significant amount of growth since 2000. The proposed master plan is much more detailed than the existing Public Facilities and Services element and is more up to date. Prior to this study much of the waste water system was unmapped. Because an accurate base map is necessary to evaluate the existing system and create a master plan, a significant effort was put into mapping the existing waste water and storm water system. Data on the existing system was obtained from a combination of record drawings, site visits, and field testing. The amendment will improve the Comprehensive Plan by providing an up to date inventory and framework for waste water and collection system improvements.

4. *D. The amendment must conform to Section 17-4.6.050 Transportation Planning Rule Compliance. (Ord. 2017-08 §1)*

**Findings of Fact:**

Section not applicable. The document does not significantly affect a transportation facility.

## Statewide Planning Goal Findings

### **Findings of Fact:**

The goal of the Citizen Involvement element of the Comprehensive Plan is to “Insure that the citizens of Molalla and those residents in the planning area have an opportunity to be involved with all phases of the planning process.” This was done with a Project Advisory Committee (PAC) that included citizens and members of City Council. In addition, news release in the local newspaper, project fliers distributed during a monthly utility billing cycle, and hosting a public stakeholders’ meeting. Lastly, holding public hearings before the Planning Commission and City Council.

The goal of Air, Water and Land Resources Quality is to “cities and counties to maintain and improve the quality of air, water.” This was accomplished with evaluation of the current system to create a master plan to meet the goal and the requirements of Department of Environmental Quality.

The goal of the Public Facilities and Services element of the Comprehensive Plan is to “Ensure livable and complete neighborhoods – with adequate sanitary sewer, water, storm drainage, transportation, park and school facilities.” One of the objectives of this element is to “Update its storm sewer and sanitary sewer master plan. The plan shall be designed to accommodate the growth anticipated in undeveloped portions of the Molalla Planning Area.” The purpose of the WWFCSMP is to:

- 1) Provide the City of Molalla with a comprehensive wastewater utility document.
- 2) Satisfy conditions stipulated in the Mutual Agreement Order (MAO) with Oregon Department of Environment Quality (DEQ).
- 3) Summarize existing system deficiencies and propose improvements to enhance system serviceability.
- 4) Recommend improvements needed to service future growth.
- 5) Develop a capital improvement plan and an appropriate system implementation strategy.

The goal of the Urbanization element of the Comprehensive Plan is to “Protect agricultural and forest land outside Molalla Urban Growth Boundary until needed for development consistent with Statewide Planning Goal 14 (Urbanization).” This was done by recommending improvements to the waste water facility & collection system needed accommodate the future of growth of the City of Molalla in the 20-year scope.

**D. Recommendation:**

City Staff recommends the Planning Commission review the Wastewater Facility and Collection System Master Plan at a public hearing and make a recommendation to the City Council to approve the Comprehensive Plan amendment or approve the Comprehensive Plan amendment with modifications.



**Public Works Department**

117 N Molalla Avenue

PO Box 248

Molalla, Oregon 97038

Phone: (503) 829-6855

Fax: (503) 829-3676

**August 8, 2018**

TO: Aldo Rodriguez, Community Planner  
Planning Commission

FROM: Gerald Fisher, Public Works Director

CC: Dan Huff, City Manager

**RE: 16-10 Wastewater Facility & Collection System Master Plan – DEQ Revision's**

On July 26, 2018, the City of Molalla received revisions comments from Oregon DEQ. On August 8, 2018, the City provided a response from Dyer Partnership and submitted a revised draft copy to DEQ addressing their comments. Attached are copies of the July 26<sup>th</sup> and August 8<sup>th</sup> documents as well as copies of the revised sheets noted in Dyer Partnership's memo to DEQ. We recommend that the Planning Commission approve the master plan as modified in this memorandum and recommend that City Council adopt the amended master plan.

Please post this document to the website as part of the record and Dyer Partnership and I will both be available for questions at the August 15<sup>th</sup> Planning Commission Hearing.

Cc: File 16-10



# Oregon

Kate Brown, Governor

Department of Environmental Quality

Northwest Region  
700 NE Multnomah St, Suite 600  
Portland, OR 97232-4100  
(503) 229-5263  
FAX (503) 229-6957  
TTY 711

July 26, 2018

GERALD FISHER, P.E.  
PUBLIC WORKS DIRECTOR  
PO BOX 248  
MOLALLA, OR 97038

RE: City of Molalla STP  
File No: 57613/Permit No. 101514  
Clackamas County

**Returned for Corrections – Draft Facility Plan**

Dear Mr. Fisher:

The Oregon Department of Environmental Quality (DEQ) has comments and corrections for the Facility Plan (Plan) for the City of Molalla (City). After edits are made by the City on this Plan, DEQ will review the Plan again prior to approval.

The plan is well written and comprehensive in scope. The existing treatment system has exceeded its design life and will not be able to handle wastewater loads in the near future. Most treatment units are undersized and inappropriate for a city the size of Molalla. The wastewater treatment plant currently has no facilities for dealing with solids. Wet weather overloads the collection and treatment systems. The recommended plan includes improvements to the collection system and pump stations, and the design and construction of a new wastewater treatment plant.

The disposal of treated water will largely remain the same, with Molalla River discharge during wet weather and land application during dry weather. The City has asked to discharge lower class reuse water, which restricts the application area somewhat but not enough to curtail the disposal volume. The City has requested a modification of their NPDES permit to allow discharge to the river when the land application fields are too wet, the river is high and significant precipitation has continued or begun earlier than normal. These periods are May, June and October. Excess rainfall exacerbates the lagoon storage of water and discharge is needed to protect the lagoons from being overtopped by stored treated water.

## COMMENTS AND CORRECTIONS

1. Page 3-4 Mutual Agreement and Order: All mention of the MAO must be removed. This MAO is not yet final. Once it is, it is subject to change and termination. The Facility Plan will exist much longer than the duration of the MAO.
2. Page 3-8: NPDES permit limits are carried over from permit to permit renewal. If the permittee is meeting the permit limits, as Molalla almost always did, there is no reason to raise the limit. If Molalla wants the limit raised, they have to prove that the additional pollution load to the Molalla River does not negatively impact the river (anti-degradation review) and that they cannot reasonably meet the strict limit by the design of the wastewater treatment plant (anti-backsliding review). Molalla has done the former but not the latter.
3. Page 3-10, Table 3.1.7 MASS LOAD VIOLATIONS: These violations have almost all been resolved as a result of a discharge volume calculation error and are no longer pertinent to the discussion.
4. Page 3-12, Figure 3.1.2 HISTORICAL EFFLUENT FLOWS OUTFALL 001 (2016-2017): These values are not corrected for the flow measurement calculation error discovered in March 2018.
5. Page 3-13, Figure 3.1.4 HISTORICAL EFFLUENT bod MONTHLY MASS LOAD (2016-2017): These values are not corrected for the flow measurement calculation error discovered in March 2018.
6. Page 3-14, Figure 3.1.6 HISTORICAL EFFLUENT TSS MONTHLY MASS LOAD (2016-2017): These values are not corrected for the flow measurement calculation error discovered in March 2018.
7. Page 3-24, Figure 3.1.6 WWTP HISTORICAL FLOWS (2014-2017): Label this figure as influent or effluent flows. If these are effluent flows, use the corrected calculations for flow data.
8. SECTION 3.3 Throughout: Label flow data as influent or effluent flows. If these are effluent flows, use the corrected calculations for flow data.
9. Page 3-26 Table 3.3.2 I/I ANALYSIS SUMMARY: This table shows that infiltration and inflow are serious problems that need to be addressed significantly before considering the hydraulic capacity of a new treatment plant.
10. Page 3-33 Figure 3.4.5 RAINFALL STORM EVENT VERSUS PLANT INFLOW: This graph shows that infiltration is a serious problem need in to be addressed in Molalla.
11. Page 4-41 Tables 4.3.23 and 4.3.25: Contradiction: Disadvantage of installing both chlorine and UV disinfection, yet the capital cost is the least. Which is correct?
12. Page 72 Table 4.6.4 FUTURE POTENTIAL NPDES PERMIT: The permit limits are not agreed upon. Remove this and any reference to potential permit limits including out of season discharge.
13. Page 5-12 Table 5.7.1 FUTURE POTENTIAL NPDES PERMIT: The permit limits are not agreed upon. Remove this and any reference to potential permit limits including out of season discharge.
14. Final Molalla WWTP hydraulic capacity should be further evaluated once a significant investment has been made to remove I/I.

RECOMMENDED PLAN

While the recommended plan will meet DEQ requirements, this section should be revised as necessary based on the comments above.

FINANCING

I did not review this section. However, I recommend including a calculation of the projected sewer rate as a percentage of median household income. EPA has indicated that sewer rates of 2% or less of median household income are affordable.

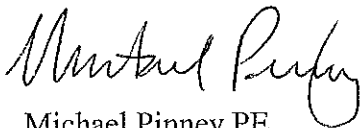
NEXT STEP

Make the corrections above and resubmit the Facility Plan. If all the corrections are made, the Facility Plan will be approved.

INQUIRIES:

Please contact me at (503) 229-5310 for additional information.

Respectfully,



Michael Pinney PE  
Senior Environmental Engineer

CC /w: Ryan Quigley P.E., Dyer Partnership Engineers and Planners, Inc., 1330 Teakwood Avenue,  
Coos Bay OR, 97420

eCC w/o:

Tiffany Yelton-Bram, Manager, Source Control Section, NWR-WQ



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www.dyerpart.com

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## MEMORANDUM

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DATE August 8, 2018  
TO Michael Pinney, PE  
(VIA EMAIL) Senior Environmental Engineer, Oregon DEQ  
FROM Tyler J. Molatore, PE  
SUBJECT City of Molalla  
Wastewater Facility and Collection System Master Plan

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Michael,

We have reviewed Oregon Department of Environmental Quality's (DEQ) comments and corrections related to the Wastewater Facility and Collection System Master Plan (WWFCSMP). Responses to DEQ's comments are summarized below. A revised copy of the WWFCSMP is enclosed for your final review.

- 1. Page 3-4 Mutual Agreement and Order: All mention of the MAO must be removed. This MAO is not yet final. Once it is, it is subject to change and termination. The Facility Plan will exist much longer than the duration of the MAO.***

RESPONSE: The Mutual Agreement and Order, whether terminated or amended in the future, is a watershed moment for the City of Molalla's WWWTP, and as such deserves discussion and context in the WWFCSMP. With that in mind, Page 3-4 was revised to take into account DEQ's concerns about the draft nature of the MAO.

- 2. Page 3-8: NPDES permit limits are carried over from permit to permit renewal. If the permittee is meeting the permit limits, as Molalla almost always did, there is no reason to raise the limit. If Molalla wants the limit raised, they have to prove that the additional pollution load to the Molalla River does not negatively impact the river (anti-degradation review) and that they cannot reasonable meet the strict limit by the design of the wastewater treatment plant (anti-backsliding review). Molalla has done the former but not the latter.***

RESPONSE: Understood.

- 3. Page 3-10, Table 3.1.7 MASS LOAD VIOLATIONS: These violations have almost all been resolved as a result of a discharge volume calculation error and are no longer pertinent to the discussion.***



RESPONSE: Due to the City of Molalla's recent discovery and subsequent DMR corrections, various parts of the WWFCSMP were updated. Following is a summary of content updated, all to take into account the revised flow data;

- Figure 2.3.21 – Page 2-44
- Figure 2.3.22 – Page 2-45
- Table 2.3.18 – Page 2-52
- Removed Table 3.1.7
- Figure 3.1.2 – Page 3-12
- Figure 3.1.4 – Page 3-13
- Figure 3.1.6 – Page 3-14
- Page 3-27

4. ***Page 3-12, Figure 3.1.2 HISTORICAL EFFLUENT FLOWS OUTFALL 001 (2016-2017): These values are not corrected for the flow measurement calculation error discovered in March 2018.***

RESPONSE: Updated, refer to response number three above.

5. ***Page 3-13, Figure 3.1.4 HISTORICAL EFFLUENT BOD MONTHLY MASS LOAD (2016-2017): These values are not corrected for the flow measurement calculation error discovered in March 2018.***

RESPONSE: Updated, refer to response number three above.

6. ***Page 3-14, Figure 3.1.6 HISTORICAL EFFLUENT TSS MONTHLY MASS LOAD (2016-2017): These values are not corrected for the flow measurement calculation error discovered in March 2018.***

RESPONSE: Updated, see response to number three above.

7. ***Page 3-24, Figure 3.1.6 WWTP HISTORICAL FLOWS (2014-2017): Label this figure as influent or effluent flows. If these are effluent flows, use the corrected calculations for flow data.***

RESPONSE: Updated, refer to response number three above.

8. ***SECTION 3.3 Throughout: Label flow data as influent or effluent flows. If these are effluent flows, use the corrected calculations for flow data.***

RESPONSE: Updated, refer to response number three above. Also, relative to Section 3.4, the following language was modified to clarify the source of the flow data.

“Unless noted otherwise, the flow data used for this report is taken from WWTP’s influent flow meter from December 2014 through August 2017 DMRs for the WWTP. The City’s wastewater system staff records the readings daily on the influent meter and rain gauge at the plant...”

- 9. Page 3-26 Table 3.3.2 VI ANALYSIS SUMMARY: This table shows that infiltration and inflow are serious problems that need to be addressed significantly before considering the hydraulic capacity of a new treatment plant.**

RESPONSE: The WWFCSMP includes several collection system improvement projects, separated into three phases. Total project costs for Phase I collection system improvement projects are estimated at \$4,380,900. Phase I projects are scheduled to be completed within the next five years.

Additionally, per Section 4-1, "Following collection system improvements to reduce I/I, reassessment of the WWTPs influent wastewater flows, resulting from the I/I improvements, should be performed. An amendment to the WWFCSMP flow projections is recommended as I/I abatement projects are completed and peak flows theoretically subside." Flows and loads will be re-evaluated during the pre-design report phase of the new WWTP, and thus take into account reductions in peak flows from phase I collection system improvement projects.

- 10. Page 3-33 Figure 3.4.5 RAINFALL STORM EVENT VERSUS PLANT INFLOW: This graph shows that infiltration is a serious problem need in to be addressed in Molalla.**

RESPONSE: Noted.

- 11. Page 4-41 Tables 4.3.23 and 4.3.25: Contradiction: Disadvantage of installing both chlorine and UV disinfection, yet the capital cost is the least. Which is correct?**

RESPONSE: Table 4.2.23 has been updated to address the inconsistency.

- 12. Page 4-72 Table 4.6.4 FUTURE POTENTIAL NPDES PERMIT: The permit limits are not agreed upon. Remove this and any reference to potential permit limits including out of season discharge.**

RESPONSE: The recommendation is for the City of Molalla to submit another permit modification application to DEQ, based on design flows associated with the new WWTP, and when the new WWTP is constructed. The content does not infer DEQ agreement or future approval, but instead is presented as an application with preliminary content. The future permit modification is referred to as an application, and as such implies that it would require DEQ review and approval, and be in accordance with DEQ processes. The future permit modification application is an important recommendation of the WWFCSMP, in that without another permit modification application, and taking into consideration pending population growth, the City will eventually violate mass load restrictions. If conditions change or permit modifications occur between now and construction of the new WWTP, actual elements of the future permit modification application could change, but the WWFCSMP should explain the need to address potential permit issues related to the new WWTP design and anticipated future flows and loads.

- 13. Page 5-12 Table 5.7.1 FUTURE POTENTIAL NPDES PERMIT: The permit limits are not agreed upon. Remove this and any reference to potential permit limits including out of season discharge.**

RESPONSE: Refer to response number twelve above.

***14. Final Molalla WWTP hydraulic capacity should be further evaluated once a significant investment has been made to remove I/I.***

RESPONSE: Refer to response to number nine above.

***15. RECOMMENDED PLAN: While the recommended plan will meet DEQ requirements, this section should be revised as necessary based on the comments above.***

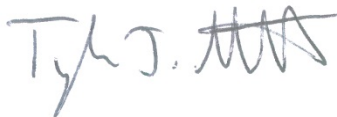
RESPONSE: Section 5 was reviewed and updated in response to the above comments.

***16. FINANCING: I did not review this section. However, I recommend including a calculation of the projected sewer rate as a percentage of median household income. EPA has indicated that sewer rates of 2% or less of median household income are affordable.***

RESPONSE: Regarding user rates, Section 6 states the following, “Changes to the City’s rate structure will be necessary. A sewer rate study will be prepared to establish rates to sufficiently fund future capital replacement and improvement needs, provide sufficient revenues for Operation and Maintenance, and maintain an adequate reserve fund.”

If you have any questions or want to discuss alternative responses to DEQ’s questions, please let me know.

Respectfully,



Tyler J. Molatore, PE  
**THE DYER PARTNERSHIP  
ENGINEERS AND PLANNERS, INC.**

**City of Molalla**  
*Clackamas County, Oregon*

**WASTEWATER FACILITY AND COLLECTION  
SYSTEM MASTER PLAN  
VOLUME 1**

**DRAFT**

*AUGUST 2018*



**The Dyer Partnership  
Engineers & Planners, Inc.**

**Project No. 100.26**

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**TABLE 2.3.16  
ALLOWABLE MAY OR OCTOBER INFLUENT FLOW**

Lagoon #1 and #2 Liquid Depth (feet) <sup>1</sup>	Equalization (feet)	Equalization Volume (acre-feet)	Allowable Influent Flow – May or October (MG)
9	3	75	24
8	4	100	33
7	5	125	41
6	6	150	49
5	7	175	57

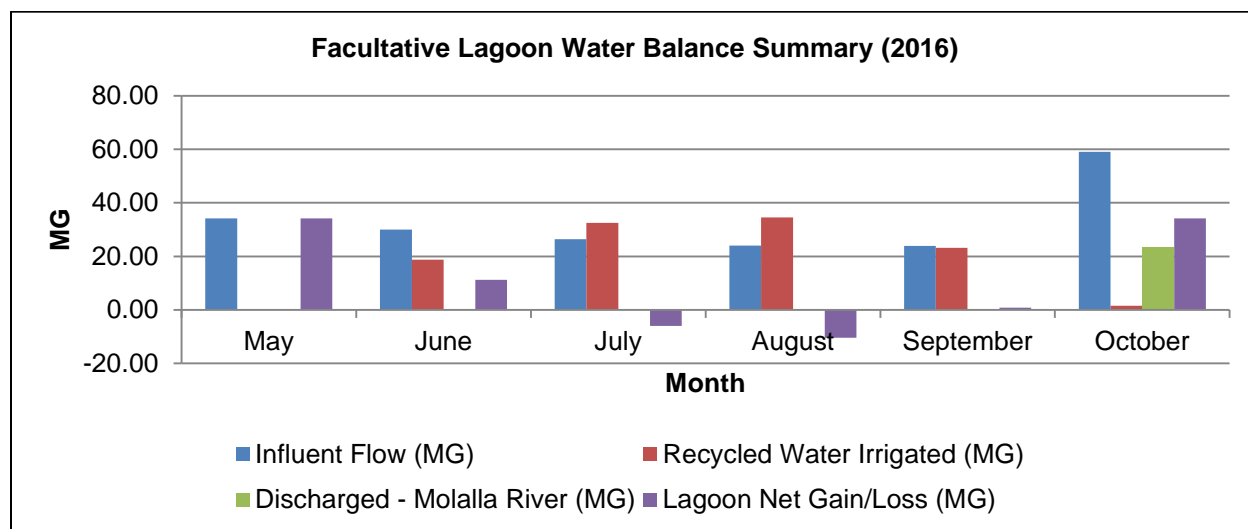
1. Liquid depth of lagoons at beginning of May and October. Facultative lagoon performance deteriorates when the liquid level drops below seven to eight feet.

Based on an analysis of the 2014 through 2016 discharge monitoring reports, on average, the City can satisfy a water balance by lowering the Lagoons #1 and #2 to a liquid depth between seven and eight feet. This provides up to 125 acre-feet of equalization storage.

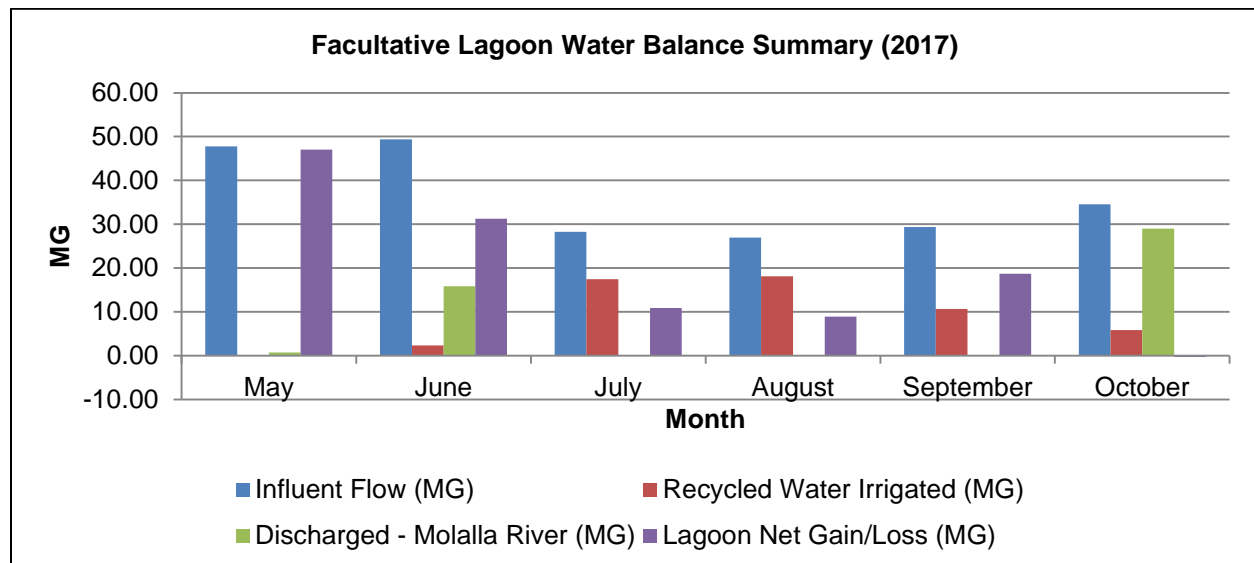
During wet months, more equalization is required because rain induced infiltration and inflow produce high flows, and rainfall prevents significant irrigation of recycled water. However, the lagoons operate optimally (biologically) at depths greater than 7 ft. Lowering the lagoon liquid depths increases the storage, but may diminish the biological capacity of the facultative lagoons and introduce excessive risk of permit violations. Consequently, under the current permit and during a wet May or October, the City is sometimes forced to discharge to the Molalla River outfall, in violation of the NPDES Permit.

Figure 2.3.21 and 2.3.22 illustrate, for the 2016 and 2017 irrigation seasons, respectively, the total monthly influent flow, total monthly recycled water irrigated, total monthly volume discharged to the Molalla River, and the resulting net gain/loss in facultative lagoon volume. As evident in Figure 2.3.21 and 2.3.22, the City can't lower the lagoons enough, and is consequently forced to store influent wastewater to the point that they eventually need to discharge to the Molalla River during the summer months, in violation of the permit. Data shown doesn't depict lagoon leakage.

**FIGURE 2.3.21  
FACULTATIVE LAGOON WATER BALANCE SUMMARY (2016)**



**FIGURE 2.3.22  
FACULTATIVE LAGOON WATER BALANCE SUMMARY (2017)**



**Odors**

Facultative lagoons are often a source of odors. The odors are primarily caused by decaying algal mats and hydrogen sulfide. Hydrogen sulfide is formed from sulfates in wastewater that are reduced in an anaerobic environment. Elimination of odors is important given that the facultative lagoons are located in close proximity to residences.

**Facultative/Storage Lagoon Leak Testing**

Leak testing for the City of Molalla’s wastewater lagoons was performed by The Dyer Partnership, Engineers and Planners, Inc. in July of 2017. The leak testing was conducted in accordance with the Oregon DEQ Guidelines for Estimating Leakage for Existing Sewer Lagoons. The guidelines for estimating leakage from existing sewage lagoons produced by the Oregon DEQ state that seepage rates as high as 1/8 of an inch per day or less are considered normal. Seepage exceeding ¼-inch per day indicates a seal failure, or absence of adequate initial seal. The lagoon leakage test did not exceed ¼-inch per day. The lagoon leakage test passed DEQ requirements.

**Dissolved Air Flotation**

Effluent from Lagoon #2 is conveyed to two DAF units; one installed in 1980 and another installed in 2007. The DAF unit (DAF #1) installed in 1980 is 31 feet in diameter. The DAF unit (DAF #2) installed in 2007 is 38 feet in diameter. The DAF units were originally designed for a total hydraulic capacity of 4 MGD, but due to high solids loading have difficulties achieving design flux rates. Based on the current flows and solids loading, the DAF system is undersized. An upgrade is necessary to meet current and future filtration needs.

Each DAF unit consists of a circular clarifier, a saturation tank, two recycle pumps (or pressurization pumps), and an influent flow meter. The primary purpose of the DAF units is to remove algae from the waste stream. Since algae and solids are continuously recycled within the treatment system, the DAF units are overtaxed. Effluent TSS concentrations from Lagoon #2 can approach, and sometimes exceed 200 mg/L. The load on the DAF units and downstream gravity filters is significant and maintenance intensive.

(duckbill), all 8-inch diameter, and provide a wintertime submergence of 12-inches and summertime submergence of 1-inch. The Molalla River is water quality impaired under DEQ’s 303(d) inventory of impaired water bodies.

The City often violates the NPDES Permit by discharging to the Molalla River outfall in May, June, and/or October. Rain induced infiltration and inflow produce high flows, and rainfall precludes significant irrigation of recycled water. The WWTP does not have adequate liquid storage, nor is the existing NPDES Permit derived based on existing flows. The BOD<sub>5</sub> and TSS mass load limits (monthly, weekly, and daily max) are based on an average wet weather flow of 1.92 MGD, which is not representative of current flows. Based on the flow analysis summarized in Section 3, the current AWWF is 2.48 MGD, and the MMWWF is 3.21 MGD. The permitted average wet weather flow of 1.92 MGD ultimately restricts the City’s ability to discharge flows at rates, during the winter months, necessary to satisfy a water balance. Table 2.3.18 summarizes the total volume of flow discharged to the Molalla River outfall in 2016 and 2017 during the summer months, in violation of the City’s NPDES Permit.

**TABLE 2.3.18  
TOTAL FLOW (MG) DISCHARGED TO MOLALLA RIVER MAY – OCT (2016 & 2017)**

<b>Year</b>	<b>Effluent Flow Discharged to Molalla River May – Oct (MG)</b>
2016	23.27
2017	45.59

**Recycled Water (Outfall 002).** Unless approved by a permit modification, the permittee is not allowed to discharge to the waters of the state from May 1<sup>st</sup> through October 31<sup>st</sup>. During this time period, effluent is required to be used beneficially by land application of recycled water on DEQ approved sites. Land application rates are dictated based on agronomic loading criteria, but also controlled by moisture block and piezometer data. The City of Molalla’s recycled water use program is governed by Oregon Administrative Rule (OAR) 340-055 and guided by the DEQs Internal Management Directive (IMD); Implementing Oregon’s Recycled Water Use Rules.

The City’s Consolidated Recycled Water Use Plan (2015) required that the City produce Class A and B recycled water. The Consolidated Recycled Water Use Plan (2015) was amended in 2018 (Recycled Water Use Plan (The Dyer Partnership, 2018)) to reclassify the land application sites from Class A or B to C. At the time that this WWFCSMP was written, the Recycled Water Use Plan (The Dyer Partnership, 2018), had not received DEQ approval. Recycled water is used for pasture and grass irrigation. Class A water is not required based on DEQ regulations, and imposes an unnecessary burden on the WWTP and the City. Moreover, the WWTP is unable to consistently produce Class A recycled water.

As outlined in the Recycled Water Use Plan, the City intends to land apply recycled water to the sites listed in Table 2.3.19. The NPDES Permit requires the effluent to be treated in accordance with Class A, B, or C requirements, depending on the land application site. The City’s Recycled Water Use Plan is based on the use of Class C recycled water. The total acreage available for the land application of Class C recycled water is 444.5 acres.



- Total Dissolved Solids. Guide concentrations listed may not be exceeded unless otherwise specifically authorized by DEQ upon such conditions as it may deem necessary to carry out the general intent of this plan and to protect the beneficial uses set forth in OAR 340-041-0340: Willamette River and Tributaries — 100 mg/l;
- Effluent BOD concentrations in mg/l, divided by the dilution factor (ratio of receiving stream flow to effluent flow) may not exceed one unless otherwise approved;
- Sewage wastes must be disinfected, after treatment, equivalent to thorough mixing with sufficient chlorine to provide a residual of at least one (1) part per million after 60 minutes of contact time unless otherwise specifically authorized by permit;
- Positive protection must be provided to prevent bypassing raw or inadequately treated sewage to public waters unless otherwise approved by the Department where elimination of inflow and infiltration would be necessary but not presently practicable.

The Molalla WWTP typically only discharges to the Molalla River during high stream flows (November 1st to April 30th). Molalla's NPDES Permit is more restrictive than the basin specific criteria for the Willamette Basin. The basis for the NPDES Permit requirement of 10/10 mg/L BOD<sub>5</sub>/TSS during high stream flows is presumably a carry-over from when the City discharged to Bear Creek.

### Beneficial Uses

Beneficial uses to be protected in the Molalla River are stipulated in Table 340A of OAR 340-041-340. Table 340A can be found in Appendix A. Included in Table 340A *Designated Beneficial Uses Willamette Basin* are:

- |                                 |  |
|---------------------------------|--|
| ▪ Public Domestic Water Supply  | ▪ Aesthetic Quality                      |
| ▪ Private Domestic Water Supply | ▪ Hydro Power                            |
| ▪ Industrial Water Supply       | ▪ Commercial Navigation & Transportation |
| ▪ Irrigation                    | ▪ Wildlife and hunting                   |
| ▪ Livestock Watering            | ▪ Fishing                                |
| ▪ Fish and aquatic life         | ▪ Boating                                |
| ▪ Water Contact Recreation      |  |

### Mutual Agreement and Order (MAO)

On May 12, 2014, the DEQ issued NPDES Waste Discharge Permit Number 101514 (Permit) to the City of Molalla (Permittee). The Permit authorizes the Permittee to construct, install, modify or operate wastewater treatment, control and disposal facilities (facilities) and discharge adequately treated wastewaters into the Molalla River, waters of the state, in conformance with the requirements, limitations and conditions set forth in the Permit. The Permit expires on June 1, 2019.

The Permittee has violated the Permit as summarized in the following sections. DEQ and the Permittee recognize that until new or modified facilities are constructed and put into full operation, Permittee might continue to violate the seasonal discharge limit as well as the daily, weekly average, and monthly average Total Suspended Solids (TSS) limits of the permit at times during the period of the pending Mutual Agreement and Order.



“In 2009, DEQ wrote a permit that reflected the settlement agreement that required Molalla produce Class A recycled water. This was carried into the 2014 permit because the limits were being met and the stated goal to DEQ was that Class A water would still be produced.”

Independent of how the current discharge requirements were derived, the existing WWTP’s violations are the end-product of a deficient average wet weather flow in combination with unnecessarily strict BOD<sub>5</sub>/TSS concentration limits. Given the population growth, mass load limits, and concentration limits, the WWTP was prearranged to violate the discharge requirements.

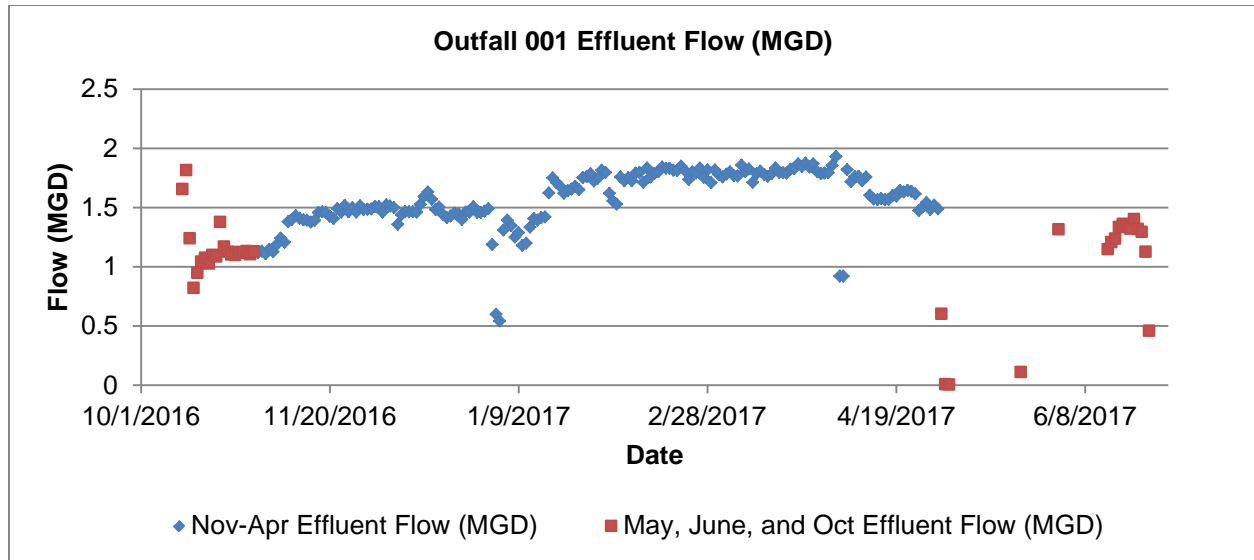
**Recycled Water Outfall 002**

All recycled water is managed in accordance with the NPDES Permit and as described in the City’s DEQ-approved Recycled Water Use Plan. Recycled water is applied at rates that do not adversely impact groundwater quality and in accordance with site management practices that ensure continued agricultural, horticultural, or silvicultural production that does not reduce the productivity of the sites. Use of Recycled Water (Outfall 002) is permitted according to the criteria listed in Table 3.1.5 and 3.1.6.

**TABLE 3.1.5  
NPDES PERMIT (101514) RECYCLED WATER MONITORING REQUIREMENTS  
OUTFALL 002 (MAY 1 – OCT 31)**

Item or Parameter	Minimum Frequency	Sample Type
Flow (MGD) or quantity irrigated (inches/acre)	Daily	Measurement
Flow meter calibration	Annually	Verification
Quantity chlorine used (lbs)	Daily	Measurement
Chlorine, total residual (mg/L)	Daily	Grab
pH	2/week	Grab
Total Coliform	Daily (Class A) 3/week (Class B) 1/week (Class C)	Grab
Turbidity	Hourly (Class A only)	Measurement
Nutrients (TKN, NO <sub>2</sub> -N+NO <sub>3</sub> -N, NH <sub>3</sub> -N, Total Phosphorus)	Quarterly	Grab

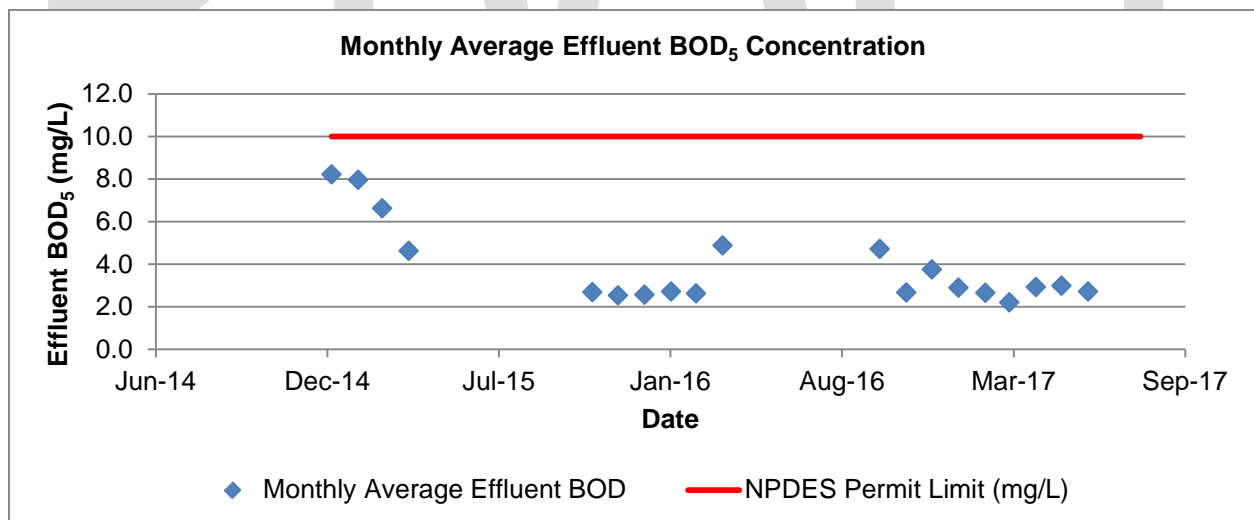
**FIGURE 3.1.2  
HISTORICAL EFFLUENT FLOWS OUTFALL 001 (2016 – 2017)**



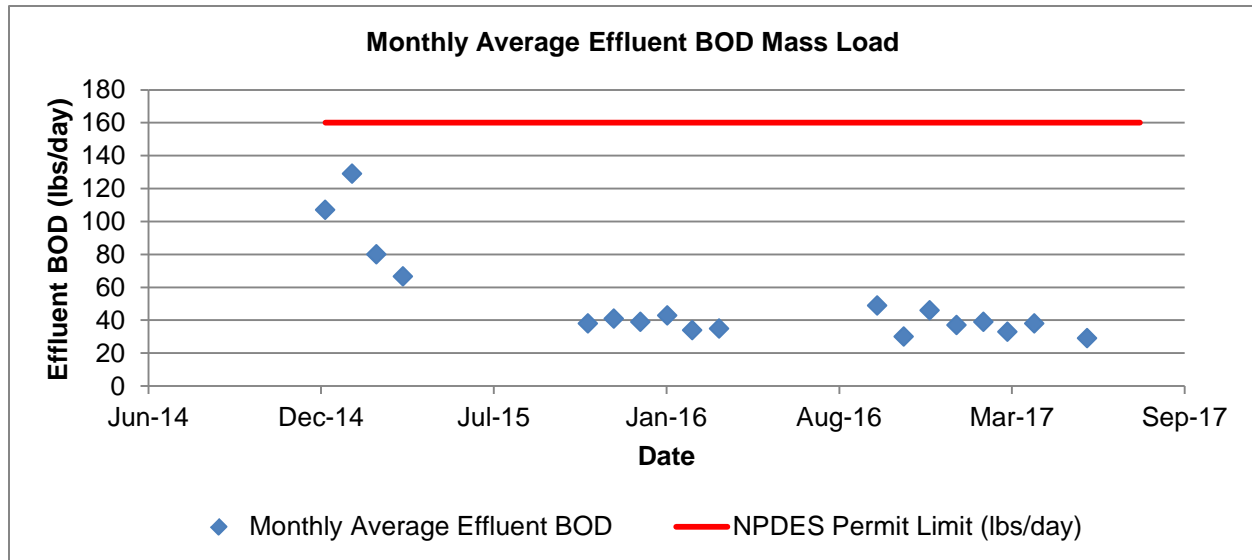
Effluent BOD<sub>5</sub> Performance

A summary of Molalla’s WWTP effluent performance, with respect to effluent BOD<sub>5</sub> concentration and mass load, is provided in Figures 3.1.3 and 3.1.4, respectively. From the time period January 2015 to June 2017, the WWTP operated in compliance with effluent BOD<sub>5</sub> concentration and mass load limits. However, the WWTP did violate BOD<sub>5</sub> mass load limits in March and April of 2014. The WWTP also violated BOD<sub>5</sub> concentration limits in February 2013, December 2013, and January 2014.

**FIGURE 3.1.3  
HISTORICAL WWTP EFFLUENT BOD<sub>5</sub> PERFORMANCE (CONCENTRATION)**



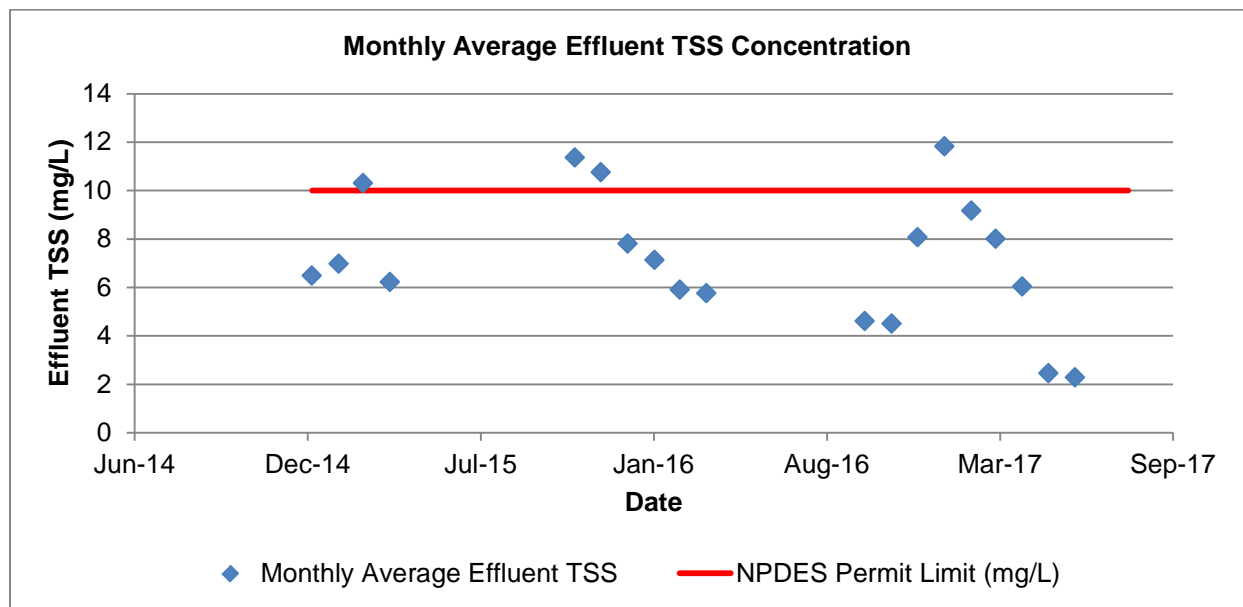
**FIGURE 3.1.4  
HISTORICAL WWTP EFFLUENT MONTHLY BOD<sub>5</sub> MASS LOAD (LBS/DAY)**



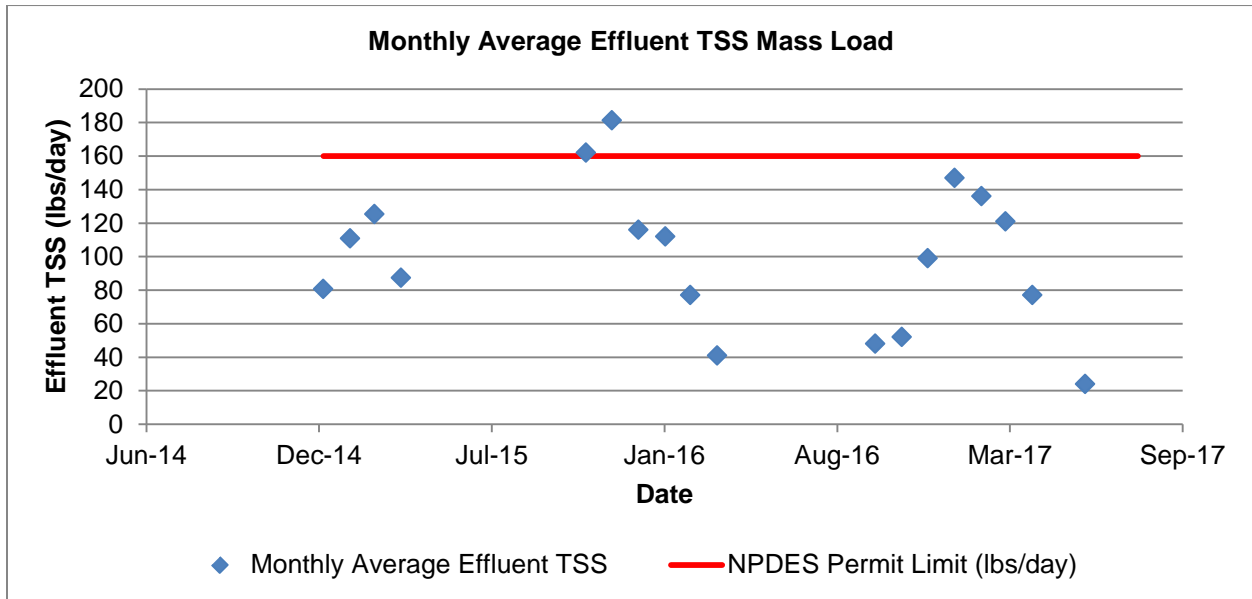
Effluent TSS Performance

The existing facility has difficulty complying with effluent TSS concentration and mass load requirements during the winter when discharging to the Molalla River. Due to high wintertime flows and the established mass load limits, the City regularly exceeds wintertime mass load limits. Figures 3.1.5 and 3.1.6 illustrate the consistent inability of the WWTP to comply with TSS limits. The WWTP is also unable, although not shown, to comply with the weekly average and daily maximum mass load requirements for TSS.

**FIGURE 3.1.5  
HISTORICAL WWTP EFFLUENT TSS PERFORMANCE (CONCENTRATION)**



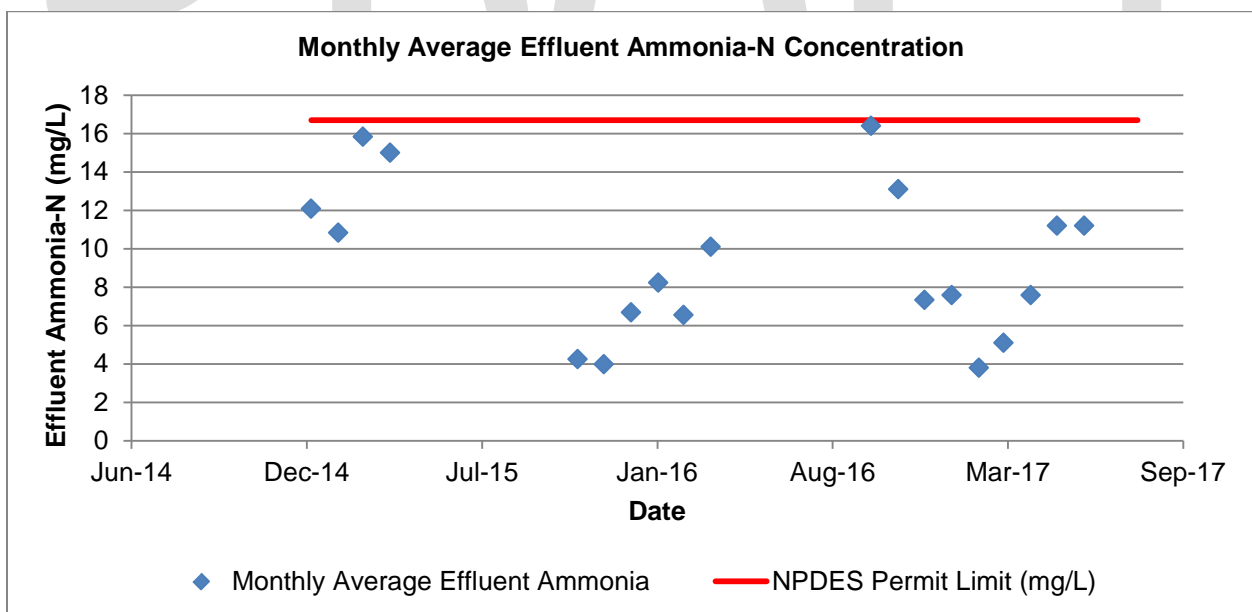
**FIGURE 3.1.6  
HISTORICAL WWTP EFFLUENT MONTHLY TSS MASS LOAD (LBS/DAY)**



Effluent Ammonia Performance

Effluent ammonia data was evaluated to identify trends or compliance problems. For the period shown, the average monthly effluent ammonia was in compliance with the monthly average permit limit of 16.7 mg/L and the daily maximum limit of 25.9 mg/L. Effluent data from the WWTP is illustrated in Figure 3.1.7 and 3.1.8.

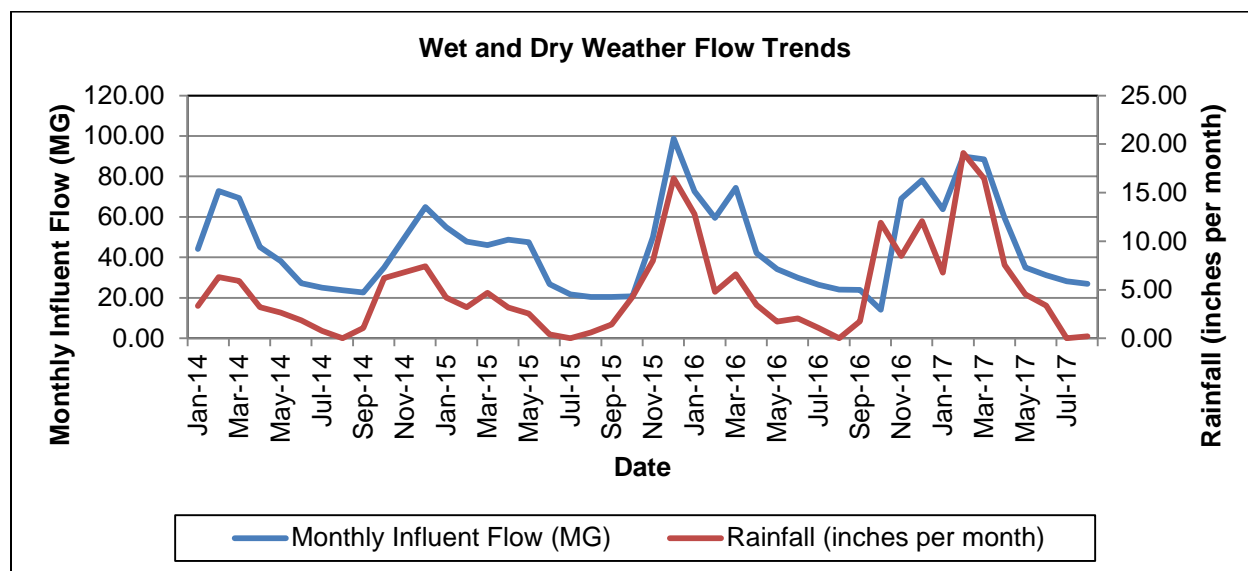
**FIGURE 3.1.7  
HISTORICAL WWTP EFFLUENT AMMONIA PERFORMANCE (MONTHLY)**



## Flow Trends

The City of Molalla receives very little rainfall from June through September. Monthly average flows at the WWTP for July are lower than in May, reflecting the reduction in rain and subsequent I/I. Wet weather flows are heavily influenced by rain and the condition of the collection system, with the highest flows typically occurring between November and April. The average wet weather monthly plant inflow volume has a strong correlation, as shown in Figure 3.3.1, to total monthly wet weather rainfall for the study period.

**FIGURE 3.3.1**  
**WWTP FLOW TRENDS (2014 – 2017)**

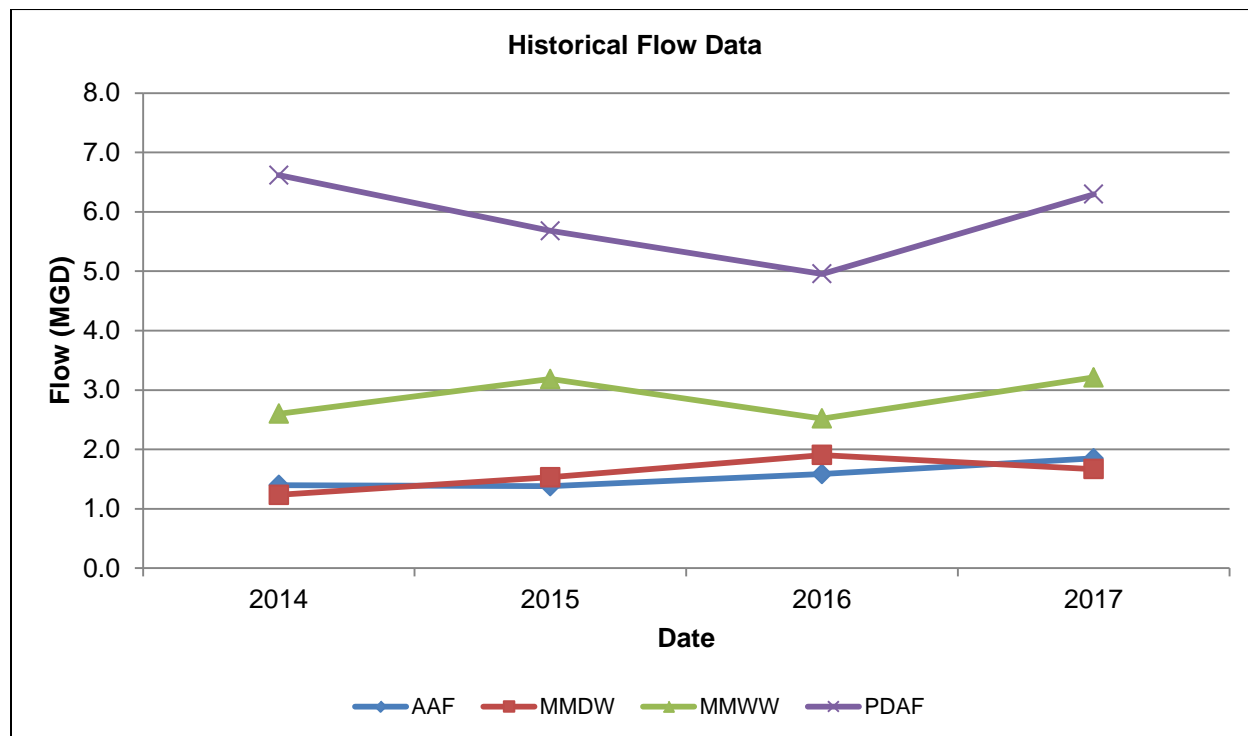


Influent flow measurements are taken from an influent Parshall flume flow meter. Monthly flow rates are at least two to three times higher in the winter months, compared to summer months.

## Historical Flows

In order to predict the hourly, monthly, weekly and seasonal variability in flow, historical flow conditions were evaluated. Figure 3.3.2 illustrates the flows observed at the City of Molalla WWTP over the past four years. Table 3.3.1 summarizes historical flow data from January 2014 through August 2017.

**FIGURE 3.3.2  
WWTP HISTORICAL FLOWS (2014 – 2017)<sup>1</sup>**



1. Flows for 2017 were evaluated from Jan-Aug.

**TABLE 3.3.1  
WWTP HISTORICAL FLOWS (2014 – 2017)**

Year	AAF	MMDW	MMWW	PDAF
2014	1.4	1.2	2.6	6.6
2015	1.4	1.5	3.2	5.7
2016	1.6	1.9	2.5	5.0
2017	1.8	1.7	3.2	6.3

### EPA Non-excessive Infiltration

The EPA guidelines (40 CFR 133.103) establish procedures on how to determine whether excessive I/I exists, and how to certify that excessive I/I has been sufficiently reduced through sewer rehabilitation. Infiltration occurs when groundwater enters a sewer system through broken pipes, defective pipe joints or illegal connections of foundation drains. System flows are analyzed under various conditions and compared to benchmarks that have been established for acceptable sanitary sewage flow rates.

Non-excessive infiltration is analyzed by investigating plant flows during periods of seasonal high groundwater with little sustained rainfall. Seven to fourteen day periods during winter months of high groundwater (December through May) were identified where little or no rainfall is measured. The average per capita flow for the system is calculated and compared to the EPA maximum flow criteria of 120 gallons per capita per day (gpcd). Under these conditions, all flows below 120 gpcd are considered to have a non-excessive infiltration component.

A fourteen day period with little or no rainfall occurred between February 11, 2015 and February 24, 2015. It is assumed that groundwater levels were high during this period. The highest flow day of that week was 2.28 MGD. Based on a 2017 population of 9,939, the resulting flow rate is calculated at 229 gpcd. Since the flow is more than 120 gpcd, the collection system has excessive infiltration.

### EPA Non-excessive Inflow

Non-excessive inflow is analyzed by investigating plant flows during periods of intense winter rainfall. Major rainfall events and the resulting system flows during winter months are analyzed. Inflow is surface runoff that enters a sewer system through manhole covers, cleanout covers, cross connections between storm sewers and sanitary sewers, and illegal connections of roof drains, yard drains, or catch basins. The EPA's non-excessive inflow criteria are based on "the average daily flow during periods of significant rainfall (i.e. storm event that creates surface ponding and surface runoff; this can be related to a minimum rainfall amount for a particular geographic area)". The average per capita flow for the system is calculated and compared to the EPA maximum flow criteria of 275 gpcd. Flows can exceed EPA guidelines if the plant operation is not impeded by such flows. Under these conditions, provided the treatment plant does not experience hydraulic overloads during storm events, flows below 275 gpcd are considered to have a non-excessive inflow component.

For the City of Molalla, the average daily flow recorded during a period of significant rainfall occurred between February 2 and 9, 2017. Flows of 6.3 MGD were generated after receiving rainfall of 4.4 inches in one day. Under these conditions and based on a 2017 population of 9,939, the resulting system flows (combined infiltration and inflow) were determined to be 633 gpcd. Since the flow is over 275 gpcd, a cost effective analysis is needed to determine if the inflow is excessive.

The EPA I/I analysis is summarized in Table 3.3.2.

**TABLE 3.3.2  
I/I ANALYSIS SUMMARY**

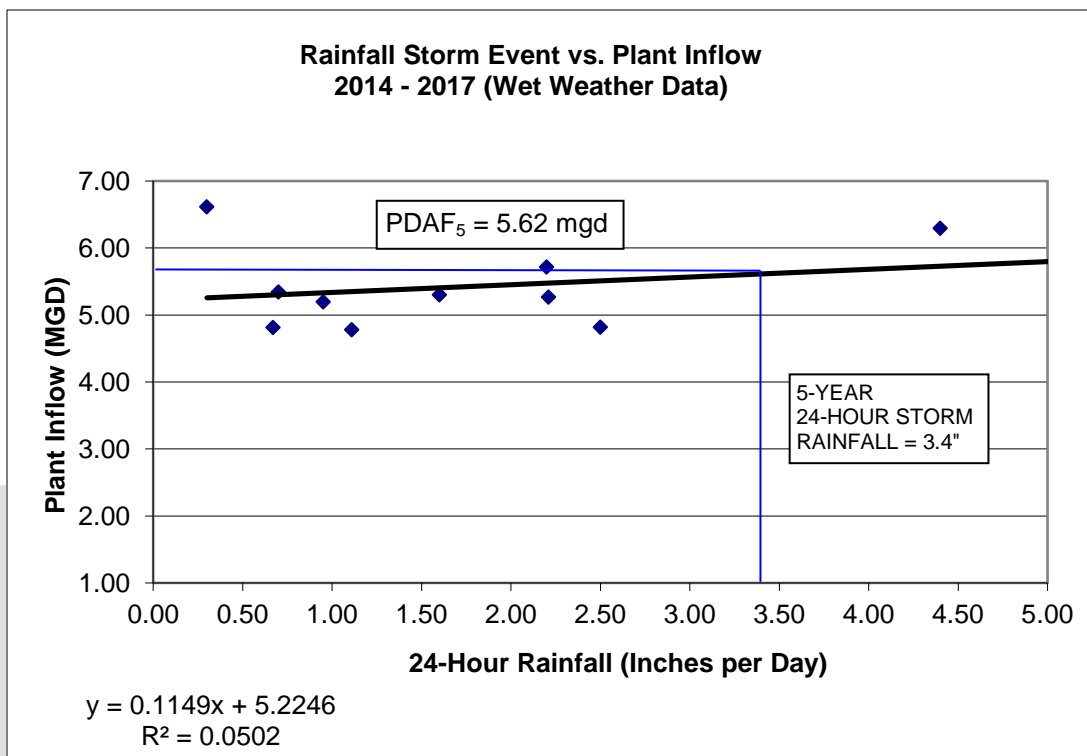
Description of Flow Condition	Flow Rate	EPA Criteria (Maximum Flow)
Base Sewage	89 gpcd	NA
Infiltration (High Ground Water)	229 gpcd	120 gpcd
Inflow (High Rainfall Levels)	633 gpcd	275 gpcd

Inflow in the system is greater than the EPA guidelines. An ongoing CMOM is required. A CMOM program typically includes video inspection of the entire collection system every five years and repair of collection system defects. In addition, a new Sanitary Sewer System Evaluation (SSE) should be performed in five-year intervals. An SSE typically includes line grit removal and cleaning, video inspection, physical inspection of manholes, performance of flow testing at structures, smoke testing of lines, evaluation of Daily Monitoring Reports (DMRs) and mapping of results. The first priority for the City is to repair deficiencies identified during smoke testing. As resources become available the infiltration deficiencies should be addressed.

### **3.4 Wastewater Flows**

Future flow projections are determined by evaluating current sewage flow rates, current pollutant loads, and population growth forecasts. Flow and load projections are for a 20-year period from initiation of operations of new equipment. Daily flows and loads are determined from rainfall statistics and system flow records.

**FIGURE 3.4.5  
RAINFALL STORM EVENT VERSUS PLANT INFLOW**



**PDAF (Record)**

Peak Day flows from the DMR records (2014-2017) were also evaluated to determine the Peak Daily Average Flow (PDAF). The peak day (highest 24-hour flow) flow during the 2014-2017 time period occurred in 2014 and was 6.62 MGD.

**TABLE 3.4.6  
PDAF (MGD)**

Year	PDAF (MGD)
2014	6.62
2015	5.68
2016	4.96
2017	6.30

**PIF<sub>5</sub> (Theoretical)**

The Peak Instantaneous Flow associated with a five-year storm event (PIF<sub>5</sub>) was estimated by using the AAF, MMWWF, peak average week, and PDAF values. These values were plotted on logarithmic probability paper, as outlined by DEQ. Such a projection is based on the principle that an average monthly flow is likely to occur 6/12 of the time or 50%, and a peak monthly flow occurs 1/12 of the time or 8.3%. Likewise, peak weekly flow will take place 1/52 of the time or 1.9%. Peak daily flow occurs once in 365 days or 0.27%. A peak hour flow happens once in 8,760 hours or 0.011%. Plotting these numbers against probability, and fitting a line to the data in excel, gives a current PIF of 9.7 MGD. A summary of existing flow rates as developed from flow data from 2014 to 2017 is provided below in



the basin to prevent short circuiting, nor is there complete redundancy in accordance with DEQ regulations. Short circuiting will continue to occur in the chlorine contact basin.

The existing tablet chlorination system is able provide adequate disinfection in accordance with discharge requirements, but only because flow equalization occurs in the facultative/storage lagoons, and additional contact time is provided in the effluent/recycled water force main. Without the aid of flow equalization upstream of the disinfection process, the existing tablet chlorination system is undersized for existing and future flows.

Tablet chlorination uses a harmful chemical with stringent safety requirements, risk management, and hazardous training and reaction protocol. The disinfection system also has unreasonably high operational costs and oversight requirements. Calcium hypochlorite also loses its strength when stored, and because it must be dissolved before being used, introduces difficulties for large installations. Calcium hypochlorite is generally limited to small installations, where handling is relatively easy for Operators.

#### Hypochlorite Disinfection System

This alternative consists of the injection of a Hypochlorite Solution (HS) into the effluent at an appropriate dosage. Hypochlorite solution is either purchased in bulk and stored onsite in tanks, or is manufactured by On-Site Generation (OSG) as an oxidant solution. It is acquired as a liquid in the form of sodium hypochlorite (NaOCl), which is bleach. It may be obtained in bulk delivery. In this form it is available in concentrations of 12.5% and 15%. Sodium hypochlorite decomposes during storage. The rate of decomposition is impacted by concentration, temperature, pH, light, and the presence of metallic contaminants in the solution. In general, 12.5% Sodium hypochlorite should be stored for no more than 30 to 60 days. The solution strength will decrease by 20% over 30 days at 80 degrees Fahrenheit (F).

Sodium hypochlorite may also be generated on site from the electrolysis of salt, (NaCl). In this form it is available in concentrations of approximately 0.7% to 0.9%. The process of onsite generation uses salt, water, and power to create a chlorine-based disinfectant (or oxidant), thereby eliminating the transport and storage of hazardous chemicals. The salt feedstock is fully converted, resulting in negligible addition of sodium to the treated water and no negative impact to irrigated landscapes. A disadvantage of onsite generation systems is that they are more complex and have high power consumption.

A hypochlorite solution or OSG oxidant solution is typically injected directly into the effluent stream as it enters a new chlorine contact basin. Sodium hypochlorite reacts with water to form hypochlorous acid and sodium hydroxide. Once chlorine is injected into the flow stream and mixed, the effluent is conveyed into a chlorine contact basin. This is a tank designed to provide adequate detention time (contact time) to assure thorough reaction of chlorine to pathogens. The chlorine contact basin design is of critical importance to maximize the detention time through the basin, and minimize short-circuiting. Baffling within the basins helps minimize short circuiting and aids in mixing.

Typically when a WWTP uses bulk sodium hypochlorite, dechlorination with bulk sodium bisulfite (NaHSO<sub>3</sub>) or sulfur dioxide is required. Sodium hypochlorite is typically delivered by tanker truck and stored in bulk tanks as a concentrated aqueous solution. Common delivery concentration is 38 percent sodium bisulfite. This concentrated solution is either diluted in mixing tanks and then fed to the system with metering pumps or fed directly with metering pumps. Since sodium bisulfite is a liquid solution, it is considered safer than sulfur dioxide, and the storage and feed systems are relatively simple.

The chlorine contact basin, a serpentine plug flow structure, would be divided into two halves, for redundancy, so that one half could be used while the other is out of service for maintenance. The tank would also include flexibility to operate both halves in series. Sufficient chlorine contact volume would

**TABLE 4.6.4  
FUTURE POTENTIAL NPDES PERMIT**

Parameter	Units	Average Monthly	Average Weekly	Daily Maximum
BOD <sub>5</sub> (May 1 – October 31)	mg/L	10	15	-
	lbs/day	271	407	542
	% removal	85	-	-
TSS (May 1 – October 31)	mg/L	10	10	-
	lbs/day	271	407	542
	% removal	85	-	-
BOD <sub>5</sub> (November 1 – April 30)	mg/L	30	45	-
	lbs/day	1326	1989	2652
	%	85	-	-
TSS (November 1 – April 30)	mg/L	30	45	-
	lbs/day	1326	1989	2652
	%	85	-	-
pH <sup>b</sup>	SU	Between 6.0 and 9.0		
Design Effluent Flow Dry Season	MGD	3.25	-	-
Design Effluent Flow Wet Season	MGD	5.30	-	-
Total Residual Chlorine <sup>c</sup>	mg/L	0.07	-	0.18
<i>E. coli</i> <sup>ad</sup>	MPN/100 ml	126	-	406
Ammonia	mg/L	16.7	-	25.9
Excess Thermal Load (May)	Shall not exceed a 7-day moving average of the daily excess thermal loads of 77.95 million kcals/day.			
Excess Thermal Load (June)	Shall not exceed a 7-day moving average of the daily excess thermal loads of 72.38 million kcals/day.			
Excess Thermal Load (July, August, September)	No Thermal Load Available – Effluent temperature must be less than 16 deg C.			
Excess Thermal Load (October)	Shall not exceed a 7-day moving average of the daily excess thermal loads of 42.43 million kcals/day.			
Dilution	Discharge may not commence until gauged stream flow exceeds 350-cfs and will cease when the average stream flow for the previous seven-day-period is less than-350 cfs.			
Notes:				
a. No single <i>E. coli</i> sample may exceed 406 organisms per 100 mL. The permittee may take at least 5 consecutive re-samples at 4-hour intervals beginning within 48 hours after the original sample was taken and the geometric mean of the 5 re-samples is less than or equal to 126 <i>E. coli</i> organisms/100 mL to demonstrate compliance with the limit.				
b. May not be outside the range of 6.0 to 9.0 S.U.				
c. DEQ has established a minimum Quantitation Limit of 0.05 mg/L for Total Residual Chlorine. In cases where the average monthly or maximum daily limit for Total Residual Chlorine is lower than the Quantitation Limit, DEQ will use the reported Quantitation Limit as the compliance evaluation level.				
d. Reported as a monthly geometric mean.				

4. Additional information for the limits in the above table.
  - a. The BOD<sub>5</sub> concentration limits are considered equivalent to the minimum design criteria for BOD<sub>5</sub> specified in OAR Chapter 340, Division 41.
  - b. Mass load limits for summer time discharge are based on 3.25 MGD.
  - c. Mass Load limits for winter time discharge are based on 5.30 MGD.

## Recycled Water Outfall 002

The City needs to expand its recycled water disposal systems. This WWFCSMP assumes that the City is successful in obtaining a mass load increase and obtaining a permit modification to discharge to the Molalla River outfall in May, when conditions allow.

Assuming that the future permit is modified as stated in Table 5.7.1, the projected effluent disposal requirements are summarized in Table 5.7.2. Assuming the City is successful in obtaining a permit modification to discharge to the Molalla River in May, when river conditions allow, the existing lagoons (i.e. recycled water storage ponds) are adequately sized for 2043 flow projections. However, additional land is required for application of recycled water.

**TABLE 5.7.2  
WATER BALANCE SUMMARY (WITH MAY DISCHARGE)**

Year	Flows (MGD)		Molalla River Discharge: Nov-May <sup>1</sup> (MGD)	Facility Requirements (Acres) <sup>2,3</sup>			
	ADWF	AWWF		Irrigation (ex)	Irrigation (add)	Lagoon (ex)	Lagoon (add)
2017	1.1	2.48	2.7	444.5	0	25	0
2025	1.34	2.98	3.3	444.5	0	25	0
2035	1.65	3.67	4.0	444.5	50	25	0
2043	1.90	4.24	4.6	444.5	100	25	0

1. Molalla River discharge assumes that October flows are stored in the lagoon and discharged over the winter months.
2. Lagoon areas (acres) represent total area at average water depth. Existing lagoon area indicated by (ex). Assumes existing lagoons are dredged.
3. Lagoon and irrigation units in acres.

To account for the anticipated flows during the 2043 planning period, the City will need to add another 100 acres of land for irrigation of recycled water. This assumes that May flows are discharged to the Molalla River (in all but the driest of years), and October flows are stored in the lagoons and eventually discharged to the Molalla River during the winter months. Additional land reserves should be identified and secured, beyond the above requirements, to provide a contingency, redundancy, and to facilitate irrigation of recycled water in May during the driest of years when discharge to the Molalla River is not permitted.

SECTION 6:  
**FINANCING**

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It is recommended that the City schedule and attend a One-Stop meeting after regulatory approval of the final WWFCSMP in order to assess the funding environment at that time. Changes to the City's rate structure will be necessary, and a sewer rate study will be prepared to establish rates to sufficiently fund future capital replacement and improvement needs, provide sufficient revenues for Operation and Maintenance, and maintain an adequate reserve fund.

DRAFT